RISK AND PROTECTIVE FACTORS FOR HOMICIDE DEATH IN DAR ES SALAAM, TANZANIA 2005

by

Anne H. Outwater

A dissertation submitted to the Johns Hopkins University

in conformity with the requirements for the degree of Doctor of Philosophy.

Baltimore, Maryland

January, 2008

© 2008 Anne H. Outwater

DISSERTATION ABSTRACT

Background

Little is known scientifically about patterns of violence and peace in low income countries, especially in Africa. Mainland Tanzania gained independence without violence and has maintained political peace, which is rare for an economically poor nation with natural resources. It is not known if this peace is reflected in the realms of the community, family, and individual. What is the context of violent death in a politically peaceful country?

Objectives

To describe the homicide rate in Dar es Salaam (DSM) 2005, the individuals who were murdered, and the contextual circumstances. To test the feasibility of the *Injury Surveillance Guidelines* developed by WHO/CDC (Holder et al. 2001).

Design and Methods

A mortality survey following the *Guidelines*, was instituted at Muhimbili National Hospital Mortuary. Quantitative variables were: sex, year of birth, date of death, residence, place and site of death, occupation, cause of death, weapon(s), events leading to death, and relationship of perpetrator. Qualitative data were gathered from participant observation, newspapers, and one open-ended question.

Results

The *Guidelines* were practical and easy to use. They were flexible enough that a new code for the variable of intent was adopted: Mob violence. Active surveillance was unsustainable.

The crude homicide rate of 12.95 per 100,000 is higher than the world average, but the lowest reported in Africa so far. The male and female homicide rates per 100,000 were respectively 23.7 and 1.7. The female rate was low compared with rates worldwide. The male:female gender gap of 14.03 was unusually wide. Unemployment and urbanization were risk factors for homicide death. Fifty percent of all homicides were victim-precipitated - males caught thieving and killed by citizen mobs responding to a cry for help.

Discussion

Partial passive surveillance is continuing through data in the Mortuary Ledger books. Mob violence is based on community self-policing against petty theft. The significance of the wide gender gap in homicide rates is not clear and has previously been seen in cities with rates of violence five times higher.

Conclusion

The *Guidelines* are suitable for low-income countries. More research is needed on community differences within DSM. Employment for young men with fair reimbursement and training is urgently needed.

Advisors:
Jacquelyn C. Campbell, PhD, RN, FAAN

Stan Becker, PhD
Nancy Glass, PhD, RN
Joan Kub, PhD, RN
Linda Rose, PhD, RN
Phyllis Sharps, PhD, RN
Daniel Webster, PhD

Acknowledgements

My parents John and Alice Outwater, and my siblings Alice B. Outwater and John O. Outwater have been constant in their support and engagement. They have offered important ideas and advice from beginning to end. My mother in particular, has given me strength when the learning curve was steepest. Her example of pursuing education all her life, including her PhD at age 60 has been a constant reassurance as has my father, with his many academic accolades.

Jacquelyn C. Campbell has been a wonderful advisor and inspiring mentor. She has pushed me and pulled me, reading and editing draft after draft, seemingly beyond mortal capacity. Her goal of building and helping others build important nursing science is unstinting. My debt to her vision and her willingness to help me build mine is incalculable. My gratitude is immeasurable.

The contribution of the other members of my Dissertation Committee Stan Becker, Nancy Glass and especially Joan Kub and Linda E. Rose, to the final product were substantial. I am indebted to them forever. June E. Miller has also been a wonderful guide.

My fellows in the PhD programs at the School of Nursing, especially Teresa Brockie and Sharon Kozachik, and at the School of Public Health, especially Alison G. Abraham have been wonderful travelling companions. Other friends for whose engagement and support I am grateful are Jean Deal, Joan Clawson, Marie-Eve Hammink, Ireen Nemes Mtui, and Edith and John Mpangala.

The study was conducted in collaboration with members of Muhimbili University College of Health Sciences without whose participation and support this research could not have occurred: Edward Mgaya, Edith A.M. Tarimo, and Lina Kinabo. In addition, this research would not have taken the form it did without the collaboration and guidance of W. Mwansasu, Eligius Lyamuya and Kisali Pallangyo. I am also grateful to Johari and Yahaya Kiobya (my Swahili teachers for almost 20 years) who have been excited and open about discussing nuances of meaning between cultures and languages.

At World Health Organization I have been grateful for the support of Alexander Butchart, Margie Peden, and Olive Kobusingye.

This journey took place with the relatives and friends of those who died a violent death in Dar es Salaam, Tanzania in 2005. Their willingness to share has made the data shine. In particular, Karimu Pazi, Rama Pazi, Ally Salehe, Eliza Wiliamu, Seifu Ally Maganga, and Moshi Juma Rashid have been willing and expressive collaborators.

This work, I believe, reflects all these people.

TABLE OF CONTENTS

Page

Abstract.....ii

Acknowledgements.....iv

Table of Contents.....vi

List of Tables.....xi

List of Figures.....xiii

Acronyms.....xiv

Table of Contents

Chapter 1

Introduction.....1

Rationale.....2

Conceptual Framework.....8

Setting.....8

Program of Research.....9

Specific Aims.....10

Study Site and Population.....11

Protection of Human Subjects.....12

Data Sharing.....13

Dissemination.....14

Chapter 2

Homicide death in Sub-Saharan Africa: A review 1970-2004.....19

Abstract.....20

Introduction.....22

Method.....23

Results.....24

Sex.....24

Age and proportionate mortality.....27

Mechanism of Injury.....29

Civil unrest.....31

Discussion.....33

Conclusion.....36

Chapter 3

Homicide Surveillance in DSM, TZ 2005: A Low Income Setting Implementation of the WHO/CDC Guidelines.....42

Abstract.....43

Introduction.....45

Previous research.....45

Surveillance.....46

Mixed Methods Research.....48

Setting.....49

Research Design.....50

Methods.....52

Data Collection instrument.....53

Variables.....54

Translation.....55

Field testing.....57

Data Collection.....59

Data analysis.....62

Results.....63

Research Process.....63

Quantitative Data Results.....65

Qualitative Data Results.....67

Cost and sustainability.....73

Discussion.....73

New Code.....74

Costs and sustainability.....76

Limitations.....77

Recommendations.....80

Conclusion.....82

Chapter 4

Homicide deaths in Dar es Salaam, Tanzania 2005.....97

Abstract.....98

Introduction.....100

Previous research.....102

Methods.....104

Definitions.....105

Data analysis.....106

Newspaper data.....107

Geomapping.....107
WHO Population Standard.....108
Results.....109
Overview.....109
Location of fatal injury.....110
Weapons.....112
Occupation.....112
Adult Males.....113
Assault.....114
Mob.....117
Adult Females.....120
Assault.....120
Intimate partners.....123
Children.....123
Discussion.....126
Overall homicide rates.....126
Male:female ratio.....129
Age.....130
Urbanization.....131
Weapons.....134
Occupation.....135
Politics.....137
Adult Males.....137

Mob violence.....138

Gangs.....142

Adult Females.....143

Children.....150

Newspaper coverage.....153

Limitations.....156

Recommendations.....158

Conclusion.....162

Chapter 5

Conclusions and Implications.....197

Specific Aim 1. Male:Female Ratio 197

Age at risk.....200

Specific Aim 2. Locations of risk 201

Specific Aim 3. Occupation.....204

Discussion of DSM Homicide Rate.....206

Implications of the Findings.....211

International and national 211

Community.....214

Household/ Relational.....218

Individual.....219

Study strengths and Limitations.....220

Implications for Nursing Science..... 222

References.....227

Appendix 1.....255

Curriculum Vita.....258

List of Tables

1.1 Eastern and Central Africa (continent) 1970-2000: Political conflict.....16

2.1 Worldwide 1990-2020, Projected change in order of 15 causes of death.....37

2.2 Sub-Saharan Africa, 1970-2004, Homicide death, Male: female ratios.....38

2.3 Tanzania 1992-1998, assault rates per 100,000 population.....39

2.4 Africa Region, Homicide death, by mechanism of injury 40

3.1 DSM, TZ 2005: Survey Variables and Codes 83

3.2 DSM, TZ 2005, Principle Qualitative and Quantitative Data Sources,
by Type of Death.....92

3.3 DSM, TZ 2005. Code &Theme Book for Homicide by Mob Violence,
with Case Numbers 93

3.4 DSM, TZ, Cases of mob killing in by year.....95

4.1 DSM, TZ 1 January – 30 June 2005, Media Coverage of Homicide, by Newspaper,
Incident Characteristic and Case Number.....164

4.2 DSM, TZ 2005. Newspaper coverage of homicide, January-June 2005,
by incident characteristics.....166

4.3 WHO World Population Standard 167

4.4 DSM TZ 2005, Characteristics of All Homicide Victims, by sex 168

4.5 DSM, TZ 2005, Number of homicide deaths, Age Stratified Rate per 100,000.....
by Sex 170

4.6 DSM,TZ 2005, Homicide deaths, Standardized using World Standard, by sex.....172

4.7 DSM, TZ 2005, Homicide: Location of Injury, by District 173

4.8 DSM, TZ 2005, Homicide Death, by District of Injury and District of Residence...174

4.9 DSM, TZ 2005, Wards with more than 10 Deaths.....175

4.10 DSM, TZ, 2005, Adult Firearm Deaths, by Reason, Sex.....176

4.11 DSM, TZ 2005, Homicide deaths ≥ 10 years, by Occupation and Sex.....177

4.12 DSM, TZ 2005, Characteristics of Adult Male Homicide Victims, by Type of Death.....179

4.13 DSM, TZ 2005.Homicide Incident Characteristics, by Males and Females ≥15 years.....181

4.14 DSM, TZ 2005, Assault, Incident Characteristics ≥15 years, by Sex 183

4.15 DSM, TZ 2005, Adult Female Homicide Victims: Intimate and non-intimate 185

4.16 South Africa and TZ, Relationship Status in Intimate Homicide Cases.....186

4.17 DSM, TZ1992-8 and 2005. Homicide Death Rates per 100,000 by Age Group and Sex.....187

4.18 Selected Countries and Cities, Homicide Death, Male: female Ratios.....188

4.19 Homicide Death Ratios: DSM,TZ 2005, Global 2002, Africa 2002, by Sex & Age.....189

4.20 Uganda 2001 & DSM 2005, Alleged Reasons for Death due to Mob Violence....190

List of Figures

1.1 Ecological Model.....17

1.2 Map of Africa.....18

2.1 South Africa, Murders per 100,000 population, by year.....41

3.1 Triangulation Design: Convergence Method.....51

3.2 Injury Surveillance System, Data Sets 96

4.1 Map of Tanzania 191

4.2 Map of Dar es Salaam, Tanzania, Urbanization by Ward.....192

4.3 Selected Cities in Africa 2005: Homicide Deaths per 100,000 193

4.4 Map of DSM, TZ Adult Male Homicide Deaths per 100,000 by Ward.....194

4.5 DSM, TZ, 2005: Firearm Deaths, by Reason 195

4.6 Selected World Regions and Cities: Homicide Death /100,000 by Sex 196

Acronyms

AMMP	Adult Morbidity and Mortality Project, Tanzania
BAC	Blood Alcohol Concentrations
CDC	Centers for Disease Control, USA
DHS	Demographic and Health Survey
DSM	Dar es Salaam, Tanzania
GBDR	Global Burden Disease Report
GNI-PPP	Gross National Income –Purchasing Power Parity
HIC	High Income Country
ICD-10	International Classification of Diseases, 10th edition
ICECI	International Classification of External Causes of injury
ICVS	International Crime Victimization Survey
ILFS	Integrated Labour Force Survey
JHU	Johns Hopkins University
JHU-SON	Johns Hopkins University, School of Nursing
LMIC	Low and Middle Income Countries
MDS	Minimum Dataset
MUCHS	Muhimbili University College of Health Sciences
MNH	Muhimbili National Hospital
NBS	National Bureau of Statistics
ODS	Optional Dataset
RMO	Regional Medical Officer
RSA	Republic of South Africa

SAPS	South African Police Service
SES	Socioeconomic status
SSA	Sub-Saharan Africa
TZ	Republic of Tanzania
TZS	Tanzania Shilling (approximate TZS.1000: US$1)
UN	United Nations
UNDP	United Nations Development Program
US	United States of America
WHO	World Health Organization
WHO-VIP	World Health Organization, Department of Injury and Violence Prevention
WRVH	World Report on Violence and Health (Krug et al., 2002)

CHAPTER 1

Introduction

The study reported here was conducted to explore and describe the risk of homicide death, those who died, and the circumstances surrounding their deaths in Dar es Salaam region, Tanzania 2005. The overall goal of this dissertation (within its program of research) is to provide one building block of an evidence based foundation upon which a research structure can be erected to build world peace.

The first paper provides a comprehensive review of the literature on homicide in Africa Region between the years 1970-2004 and identifies limitations in the existing literature. Recommendations are made for further research including development of in-country surveillance systems.

The second paper focuses on the methods used to undertake the study at the Muhimbili National Hospital Mortuary in Dar es Salaam, Tanzania, 2005. How a new code, mob violence, emerged from the qualitative and quantitative survey data is described. The survey, as a foundation for an on-going surveillance system is evaluated and suggestions for future improvement and sustainability are made.

The third paper describes the results of the homicide survey. Results from the survey describe the how, where, and why of those who died. Three types of homicide are identified and described: assault, mob violence, and neonaticide. This paper describes overall patterns of violence and identifies key factors correlated with homicide violence.

Rationale

Homicide is an extreme event. Although statistically rare, homicide is the most visible aspect of interpersonal violence in that it is detected and recorded in a more reliable, less biased way than more frequent but less extreme manifestations of conflict. It is commonly used as a marker of violence in a society, but it is the "tip of the iceberg" in terms of overall interpersonal violence. Burden of disease studies estimate that interpersonal violence is a leading cause of premature mortality and contributes significantly to healthy years of life lost globally. The World Health Organization (WHO) World Report on Violence and Health (WRVH) reports that violence disproportionately affects low and middle income countries (Krug, Dahlberg, Mercy, Zwi & Lozano, 2002).

At present, the long-term social, economic, and demographic impact of major diseases and injuries in low-income countries can only be estimated using models since there is little empirical data on age and cause-specific morbidity and mortality (Baiden, Hodgson & Binka, 2006). However globally, homicide rates are believed to be highest in South America and Africa Regions (Peden, McGee, Sharma, 2002). It has been estimated that the proportionate mortality for interpersonal violence in the African region was about 1.2% in 2002, and accounted for about 134,115 person deaths (GBDR [Global Burden of Disease Report], 2002).

Among WHO regions mortality rates due to injuries arising from interpersonal violence were highest in the Americas followed by the African and the European Regions (GBDR, 2002). This is confirmed by data from the UN Crime Trends Survey and

Interpol, which shows that the highest regional murder rates are recorded in South America and the Caribbean and in South and West Africa (Muggah, 2007).

Research on violence in Africa has not been a priority, yet it clearly poses a large public health burden. The impact of violence is profound and lasting. People are left dead or wounded physically, emotionally, intellectually and spiritually. The repercussions affect individuals, their families, and communities in unpredictable often painful ways, reverberating across generations. Experience of one form of violence increases the risk for other types of violence (Campbell, 1995, Krug et al., 2002).

The WRVH (Krug et al.,2002) provided "an initial sense of the global extent of the interpersonal violence problem" (Butchart 2004, p.vii). The central yet frequently overlooked role of the health sector in preventing such violence and treating its victims was made explicit. The Report had nine recommendations:

- Create, implement and monitor a national action plan for violence prevention.
- Enhance capacity for collecting data on violence
- Define priorities for, and support research on the causes, consequences, costs, and prevention of violence
- Promote primary prevention responses
- Strengthen responses for victims of violence
- Integrate violence prevention into social and educational policies
- Increase collaboration and exchange of information on violence prevention
- Promote and monitor adherence to international treaties, laws and other mechanisms to protect human rights

- Seek practical, internationally agreed responses to the global drug trade and the global arms trade.

The Fifty-Sixth World Health Assembly in 2003, in Resolution A56/24 supported the recommendations from the World Report on Violence and Health (Krug et al., 2002) and requested "research to support evidence-based approaches for prevention of violence and mitigation of its consequences at individual, family and societal levels, particularly research on multilevel risk factors for violence, and evaluation of model prevention programmes" (WHO, 2003).

The ability to create effective polices and programmes for the prevention of violence and treatment of victims, survivors and perpetrators is dependent on an understanding of the root causes of violence in a specific social context (Butchart & Brown, 1991; Gilbert, 1996). In response to the huge knowledge gaps and the difficulties standardizing reporting and expanding data collection (Outwater et al. 2007), WHO, from the Injury and Violence Prevention Department is coordinating and supporting countries to set up injury surveillance systems, so that incidence and prevalence can be monitored (Holder et al. 2001). In-country capacity building for injury surveillance has been started in several African countries (Butchart et al., 2001; Kobusingye & Lett, 2000; Bartolomeos and Peden, 2003; Mutto, 2007), including Tanzania as a result of this dissertation research (Outwater and Shepherd, 2007).

Surveillance through data collection is the first step in defining the problem; usually a few risk and protective factors can also be identified through surveillance questions. Without this basic information, interventions can be wasteful, sometimes harmful, only randomly effective, and cannot be evaluated. Surveillance systems can

provide a foundation for further research, preventive action, and evaluation (Mercy & Hammond, 1999).

Nursing science has traditionally been concerned with interventions to save and heal victims and perpetrators of violence. But prevention is preferable (Campbell, 1981; Reza et al., 2007). Groundwork for nursing science to help prevent the morbidity of violence, through identification of risk and protective factors as the basis on which to develop effective interventions was laid in 1981 with Campbell's review on female homicide (1981). Diminishing risk and increasing protective factors of violence are challenges nurses can meet. However as yet little knowledge is available on which to base prevention interventions, especially from low income countries.

Nurses are especially well positioned to lead and be involved in research on violence and violence prevention in that we are trained to respond and care for those in distress and to work in interdisciplinary research teams to address major health care problems (Walton-Moss & Campbell, 2002; Humphreys et al., 2001; International Council of Nurses, 2001).

Conceptual Framework

Violence is multi-contextual and a homicide death is the convergence of diverse influences from society, community, family, and within the individual. To allow understanding of such complicated interactions a conceptual framework that allows for the exploration of interactions between individuals and their relationships (family, friends), neighborhoods and communities, and society (national/international) is the appropriate one.

The Ecological Model provides such a framework for understanding the multiple factors that contribute to violence. It assumes that violence is caused by the interaction of factors at all levels of the ecological model. Interventions to prevent or reduce violence seek to address one or several of the Ecological Model's levels.

The Ecological Model is based on the work of Bronfenbrenner (1979), developed through his studies with young children. It was been further modified by Heise (1998) and Mathews (2007) in studying violence against women, and Little and Kantor (2002) for all forms of family violence. The model was incorporated into the World Report on Violence and Health (Krug, Dahlberg, Mercy, Zwi & Lozano, 2002). The Ecological Model used in this dissertation has been extended conceptually to include the international realm (see Figure 1).

The Ecological Model asserts that violence is the product of multiple levels of influence on behavior. Violent injury deaths are the result of the interplay between individual and contextual forces. The Ecological Model allows for the exploration of interactions within and between individuals, families, neighborhoods, and society. At the individual level, the Model considers biological (such as age, sex, health status) and personal history (educational attainment, occupation, income, religious observation, psychological and personality disorders, history of abuse, and substance abuse) factors that might influence a person's behavior.

At the relationship (sometimes called the household or family) level, the model considers social relationships and how these increase the risk of being a victim or perpetrator of violence. Factors include poor parenting practices and family dysfunction,

socioeconomic status of the household, resource availability, and associating with friends at risk of engaging in violence.

At the community level, the model considers the contexts in which social relationships take place such as neighborhoods, schools, workplaces, and other institutions. A city is composed of many communities, and can also be considered a community. Poverty, high residential mobility, social isolation, cultural values, access to firearms, and access to healthcare, schools, justice and employment are factors to consider at the community level.

At the national level, the Ecological model considers the factors embedded in the larger society that influence rates of violence. Such factors include natural resources, and broad economic, social, health, education, laws and policies that maintain or increase economic social inequalities, the availability of firearms and other weapons, and weak criminal justice systems.

International level factors that influence risk of violent death, include trade policies, natural environment, migration, and influences from international non-governmental organizations (NGOs), international corporations, bordering nations, and the United Nations (for example when they support and re-settle war refugees).

Homicide is interpersonal violence that occurs at the relationship/familial and community levels of the Ecological Model. The data from the 12 surveillance variables reported in this dissertation are basic descriptors of the victim and events surrounding the injury at the individual, family/relationship, and community levels. Not addressed are the international and national forces that impact on interpersonal violence and are beyond the scope of this dissertation.

Setting

Research to investigate the specific risk factors for violence is only beginning in low and middle income countries (Krug et al., 2002; Peden, McGee, Sharma 2002; Butchart & Engstrom, 2002; Institute of Medicine, 2007). However it is known that group conflicts are centered in resource rich (including oil, gold, diamonds, copper, timber, and coltan) regions whose markets are predominantly Europe and the United States (Le Billon, 2001) and increasingly China. Countries with a combination of natural resources, low economic status and political peace are unusual and merit special study (Butchart & Engstrom 2002). Tanzania is such a country and so was chosen for the site of this research.

Tanzania lies on the east coast of Africa, neighboring eight countries and the Indian Ocean (see Figure 1.2). A land of natural resources (gold, diamonds, gas, timber, fish), Tanzania was created in 1964 as a united republic of two political entities – the islands of Zanzibar and the former Tanganyika. Mainland Tanzania (TZ) has been chosen as the site of this study because of its unusual legacy. Tanzania gained independence in 1961 from British colonialists without violence and has maintained political peace since. TZ is one of two countries, in the eighteen nations comprising Eastern and Central Africa, that has maintained a history of peace and stability (see Table 1).

It is a nation of more than 38.3 million people. It is rated as one of the World's poorest nations (World Bank, 2007); in 2005, the year these data were collected, the purchasing power parity (PPP) of people in TZ was fifth lowest in the world, $730/year (as compared to a per capita PPP of $41,950/year in the US, the country with the third

highest PPP), a disparity of about 56:1 (World Bank, 2007). While TZ stands as one of the few African countries to maintain peace and stability, it is the upper part of a band of 3 peaceful countries including Zambia and Botswana running through South-Central Africa. In background interviews to this research many Tanzanians expressed the idea that peace was consciously chosen and practiced.

Program of Research

This dissertation is part of an ongoing program of research that is addressing different levels of the Ecological Model in order to discover the risk and protective factors for violence and its opposite, peace. The research conducted for this dissertation is part of the cornerstone of that program.

To start addressing the individual level of the Ecological Model, a violent death (intentional injury) survey (including homicide, suicide, and police deaths) was conducted in DSM Region by a team of researchers from Johns Hopkins University, School of Nursing and Muhimbili University College of Health Sciences, Departments of Nursing, Medicine, Public Health. This dissertation analyzes the homicide data that were collected in 2005 . The suicide data has already been analyzed and accepted for publication (Mgaya, Kazaura, Outwater & Kinabo in press).

In order to compare those who died a violent death with those who did not in DSM at the individual and family level of the Ecological Model, additional data were gathered from respondents of the Violent Death survey, willing to answer more questions. After signing informed consent they were offered the opportunity to (a) answer a household survey which addressed the deceased's history, education, religiosity, living conditions and interpersonal relations with family and friends, (b) answer open-ended

questions about family care that occurs after a violent death and the African philosophy of utu / ubuntu and/or (c) participate in an in-depth interview. The Case Household surveys were compared with Controls that were age and sex-matched individuals within households randomly sampled throughout DSM.

In order to deeply understand the context in DSM, additional in-depth interviews have been conducted with religious and community leaders, journalists, youth at risk and those who know them. As well, focus groups with youth at risk for violent death (thieves and port workers), and youth not at risk (choir members) have been conducted. Additional papers based on these data have been planned and are in process both by this author and Tanzanian co-investigators. The homicide portion of the violent death survey is the concern of this dissertation.

Specific aims

The specific aims of this dissertation are designed to help answer basic questions of global relevance about interpersonal violence in low income countries, especially in Africa Region. They are designed to address the needs of Tanzania and Dar es Salaam specifically, so that interventions can be targeted. Since little is known about homicide in TZ, broad questions are being explored. The aims of this research will be to describe some risk and protective factors of homicide death amongst individuals in Dar es Salaam, Tanzania.

Specific aims and hypotheses are to:

1/ Identify the individual risk factors for homicide death in Dar es Salaam, Tanzania including the hypothesized relationships below

Hypothesis 1: Males will be at higher risk of violent death than females.

Hypothesis 2:Young adults (ages 15-34) are at higher risk of violent death than other age groups.

2/ Identify the geographic areas and locations of risk (residence, place of occurrence) for homicides within Dar es Salaam (DSM).

3/ Identify the occupations of homicide victims in DSM.

Hypothesis 1. Unemployed people are at higher risk of homicide death than those in the formal or informal business sector.

Study Site and Population

This study took place in Tanzania's leading region, Dar es Salaam (DSM), population 2.84 million, from 1 January 2005 – 31 December 2005. Data were collected at the Muhimbili National Hospital (MNH) mortuary.

All those who succumb to violent death in DSM must by law be taken, registered, and officially witnessed by police, relatives, and the pathologist at the mortuary with the body before being released. The process usually takes 3 days and includes two visits of the deceased's family - during the first visit family members make preliminary identification of the deceased; the second visit is pre-planned because it occurs at the time of the post mortem which is scheduled. The second visit was almost always in the morning, and included hours of waiting between the tasks of formally identifying the body, cleaning it and preparing it for burial, paying various fees, receiving various forms, and renting a vehicle to carry the body. The second visit is also after the immediate shock of the preliminary identification of the body. Interviews were conducted during the second visit, taking advantage of the waiting time and the lower level of distress of family members.

While family and neighbors were waiting, the nurse researchers asked them 13 survey questions. Whoever was willing to participate was offered a choice of a private space in which to be interviewed, or a semi-public veranda shaded by the sun. They always wished to be interviewed together, on the outside veranda, a place that was visually accessible to others but aurally inaccessible. People did not refuse to answer the surveillance questions.

Protection of Human Subjects

Individual consent was not needed for primary subjects, because the subjects were deceased. However many different bodies had the right to give or decline to give consent for the additional information they provided for this study and protection of human subjects in this regard, was closely monitored. Special permission and ongoing cooperation was granted by Tanzania Police Force, and the Regional Medical Officer of Dar es Salaam who also had been part of the study's formulation. The protocol was approved by and periodic reports sent to the Tanzania Commission of Science and Technology, the National Institute of Medical Research, Tanzania and the Muhimbili University College of Health Sciences Research and Publication Committee, the Johns Hopkins University Institutional Review Board (JHU-IRB), and National Institute of Nursing Research of the US National Institutes of Health.

The South African Medical Research Council has much experience gathering data in places of potential violence, especially in the field of violence against women. They address 7 principles of ethics in violence research (MRC, 2002), which were followed:

- The objectives of the study must never be put above the subjects' or the respondents' well being

- The safety of the respondent and interviewer must be primary concerns
- Interviewing approach must be non-judgmental
- Risk of secondary traumatization of respondents and researchers must be considered before interviewing
- Interviewers must be trained to offer to stop the interview if the respondent becomes distressed
- Interviewers need to be equipped to respond to distress
- Interview schedules should end in a positive manner.

The interviewers were nurses trained to respond to distress, and had access to Muhimbili National Hospital. The protocol for distress response was approved by the JHU IRB as well as the National Institute of Medical Research, Tanzania, and the Muhimbili University College of Health Sciences Research and Publications Committee

Data Sharing

The original survey forms for year 2005 are at Muhimbili National Hospital under the auspices of the primary collaborator, Edward Mgaya. Duplicates are with the PhD candidate.

As suggested in the *Injury Surveillance Guidelines* (Holder et al., 2001), the EpiInfo program was used for data entry and analysis. It was downloaded for free from Centers for Disease Control (CDC), making it possible for all members of the research team in both Tanzania and the United States to share datasets with minimal problems, and upgrade versions independently.

Data were entered in Tanzania throughout 2005. In January and February 2006 the data was cleaned with one person reading (the PhD candidate) and the other entering the data. Preliminary data analysis was conducted with these data. Then the data were brought back to JHU and carefully examined for errors. Many data entry errors were found so the data were cleaned again by the PhD candidate. Occupation and reason for death (to include bystander events) were re-coded. The variable of "activity at time of death" led to little useful information and was finally excluded from further analysis; time of death would have been more useful.

Dissemination

Dissemination of study results has occurred at seminars, presentations at international conferences, as well as preparation of papers for publication in peer-reviewed journals.

Preliminary findings were first presented as a poster at the annual meeting of Association of Pathologists in East, Central, and Southern Africa, Arusha, Tanzania 2006. This was followed by presentations of preliminary results at the bi-annual meeting of the Transcultural Nursing Society in 2006, and at the WHO-AFRO Violence Expert Group meeting, Harare, Zimbabwe, 2006. Results were presented at the HAUSA (Hopkins All University Seminar on Africa) 2007 and as part of a workshop at World Health Organization 3rd Milestones Meeting in Edinburgh in July 2007. Many results have also been included in the WHO-AFRO report for Violence and Health in Africa to be launched in November 2007.

The first paper of the dissertation was published in African Safety Promotion: A Journal of Injury and Violence Prevention, in 2007. The second paper will be submitted

for publication in Homicide Studies: An interdisciplinary and international journal. The third paper will be submitted to the Bulletin of the World Health Organization. In-country seminars and meetings to disseminate the research results will start in January 2008 with the Police, Ministry of Health officials, members of the Muhimbili University College of Health Sciences community, and the at-risk young men in DSM.

Table 1

Eastern and Central Africa 1970-2000, Political conflict

Conflict / Nation	Coup	Assass-ination	Civil War/ Social Strife	Active War
Burundi	X	X	X	X
Central Afr. Republic	X		X	
Chad	X		X	X
Congo, D.R.	X	X	X	X
Djibouti			X	
Eritrea			X	X
Ethiopia	X	X	X	X
Kenya		X	X	
Madagascar		X	X	
Malawi				X
Mozambique	X	X	X	X
Rwanda	X	X	X	X
Somalia	X	X	X	X
Sudan		X	X	X
Tanzania, U.R.[a]				
Uganda	X	X	X	X
Zambia				
Zimbabwe			X	X

[a] Tanzania defended itself when Uganda troops under Idi Amin trespassed onto Tanzania soil 1978-1799. The Ugandans were pushed back to Kampala, whereupon the Tanzania Armed Forces left the country.

Figure 1.1

Ecological Model Including Risk and Protective Factors for Homicide Death

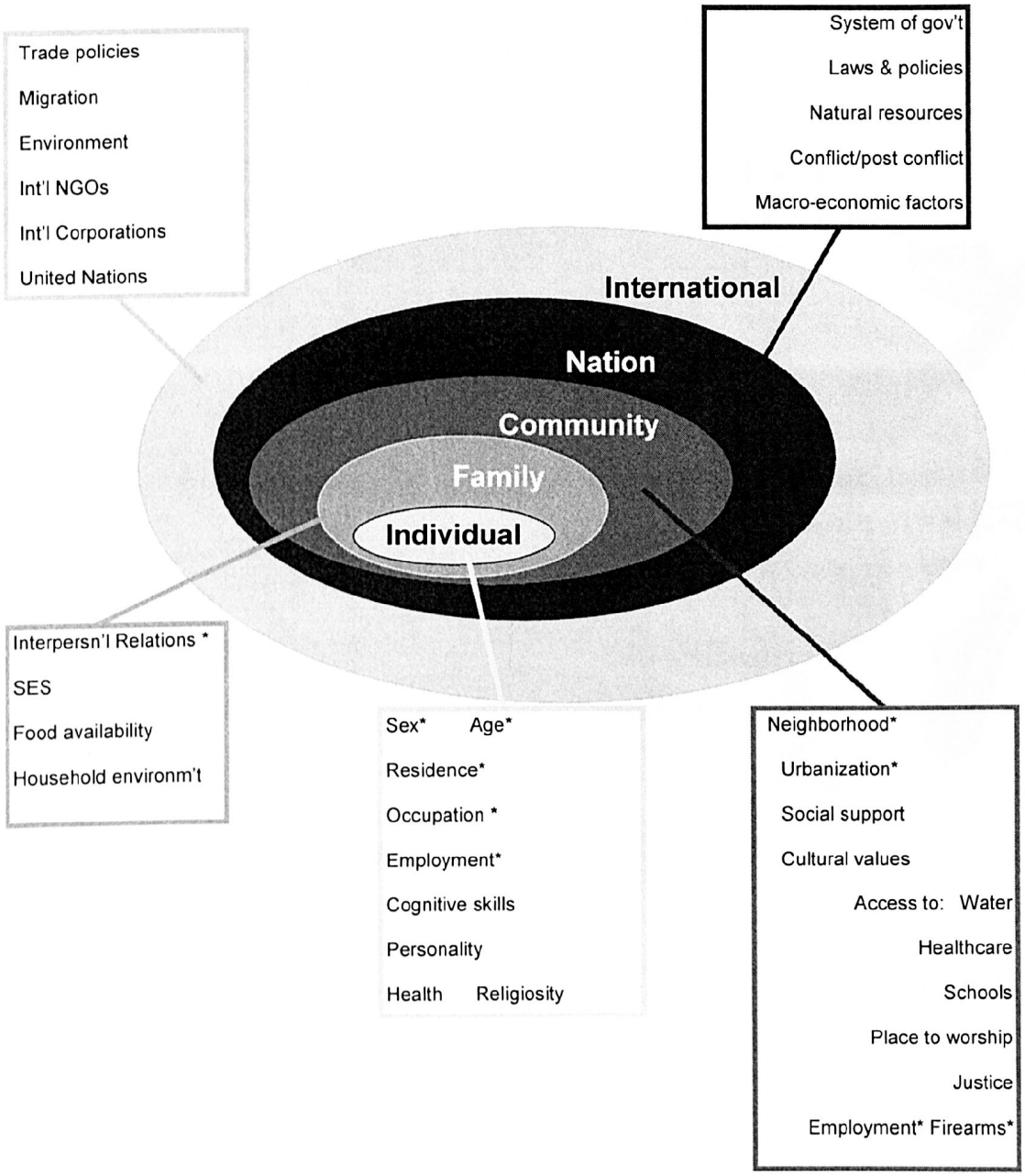


Figure 1.2

Continent of Africa



Permission to use map:
"http://www.map-of-africa.co.uk">Map of Africa

WHO African Region consists of 46 United Nations member states, all of which are classified as low or middle income: Algeria, Angola, Benin, Botswana, Burkino Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Cote d'Ivoire, Democratic Republic of Congo, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Africa, Swaziland, Togo, Uganda, United Republic of Tanzania, Zambia, Zimbabwe

Homicide death in Sub-Saharan Africa: A review 1970-2004

by

Anne Outwater, Jacquelyn C. Campbell, Daniel Webster & Edward Mgaya

Abstract

Violent deaths (by suicide, homicide, and war) reached unprecedented heights in the twentieth century and globally, are predicted to increase. The foundation for explanatory models of violence in developing countries is rudimentary. The objective of this review is to describe what has been published in the peer-reviewed literature about homicide in Sub-Saharan African (SSA) 1970-2004. Starting with searches in PubMed, OVID, and African Journals on-Line (AJOL) using key words <homicide> and <injury death> <Africa>, 37 articles were found. Their reference lists were examined for further literature. Twenty seven of 55 SSA countries have no peer-reviewed literature on injury death. Articles were excluded if it was impossible to sort out homicide from suicide or unintentional injury death. Thirty articles contained information about homicide. It was found that throughout Africa, males are 4-10 times more likely to die of homicide than females. Children are protected; adults 20-29 years are at highest risk. The most common mechanism may be sharp instruments. It is estimated that Africa is the world's second most violent continent (World Health Organization Statistical Information System [WHOSIS], 2007), a judgment made on scant data. Regional variations exist but it is not yet possible to answer basic questions such as proportionate mortality, occupation of the deceased, ethnic or national differences, precipitating factors, or relationship between perpetrator and victim. Temporal trends cannot be ascertained. Qualitative and quantitative research is needed to develop effective prevention strategies. World Health Organization is coordinating and supporting countries to set up injury mortality

surveillance systems, as a first step, so that incidence of homicide and morbidity of other violence can be monitored.

Key words: homicide, Sub-Saharan Africa, review

COLLEGE LIBRARY
MUHIMBILI UNIVERSITY
COLLEGE OF HEALTH SIENCIES

CHAPTER 2

Homicide death in Sub-Saharan Africa: A review 1970-2004

The number of deaths due to violence reached unprecedented heights in the twentieth century (Rummel, 1997). The Global Burden of Disease Report supported by World Bank, World Health Organization, and Harvard University predicted that by 2020 all forms of injury burden would increase dramatically – both disease burden and death from homicide, war and suicide are expected to move to the top 15 causes of death (see Table 2.1). This predicted increase in violence-related mortality was confirmed by a recent study of 22 countries using the World Health Organization (WHO) mortality database; it was found that firearm related homicides increased in the last decade (Sharma et al. 2004).

Africa is considered the second most violent continent in the world (Peden, McGee, & Sharma, 2002). However, this assessment is based mostly on extrapolations from South African data. Most African nations became independent in the 1960's and all have faced great economic and political change over the subsequent decades. Most inter-country, tribal and factional violence in Africa are centered on resource rich (including petroleum, gold, diamonds, copper, timber, and tantalite) regions whose markets are predominantly in Europe and the United States (Le Billon, 2001).

This review describes what has been published in the peer-reviewed literature about homicide in Sub-Saharan Africa (SSA) 1970-2004.

Method

Homicide is defined in a manner consistent with the International Classification of Diseases that includes intentional injury death by blunt object, sharp object, firearms, fire, poisoning, drowning, strangling/hanging, electrocution, exposure to the elements, and use of the physical body.

The review included searches through PubMed, OVID, and AJOL (African Journals on Line), using the key words < homicide, Africa> < injury death, Africa> resulting in 37 articles. Full texts of the relevant articles were obtained when possible. Since French is an important language in Africa, effort was made to obtain French literature to decrease the bias towards literature published in English. The reference lists of the articles obtained were examined for further literature. Peer review journals providing quantitative and qualitative data about homicide in SSA, including hospital and mortuary reports which have been largely excluded from other reviews, were included. The sparse literature on war, war-related and refugee camp deaths were excluded as were reports published by individual country Ministries of Health. The principal reason for excluding an article was if it was organized by type of injury and it was impossible to sort homicide from suicide or unintentional injury death, and mortality from morbidity; this criterion especially excluded potentially useful information centering around head and gunshot injuries.

Of the 55 counties in SSA, 27 had no peer-reviewed literature on any aspect of injury death. Thirty articles containing information about homicide met the criteria. They present data from Kenya (2), Mozambique (2), Nigeria (6), Senegal (1), Republic of South Africa (18), and Tanzania (1). Ten of the studies, including one case study, are

prospective; eighteen are retrospective examinations of mortality registers; the two qualitative studies are of perpetrators.

Results

In 1990 only 1% of all deaths in Sub-Saharan Africa were noted in vital registration systems, and the injury data that did exist was based on incomplete police and health facility records (Murray 1987; Nordberg 1994; Kaufman, Asuzu, Rotimi, Johnson, Owoaje, & Cooper 1997; Holder, Peden, Krug, Lund, Gururaj, & Kobusingye, 2001; Krug et al. 2002). Drawing on WHO databases, Butchart & Engstrom (2002) found that only 61 (of 191 United Nations member countries) in 1995 had homicide data that was more than 50% accurate, and none were in Africa. In some African countries, death registration, even of homicide cases is not enforced in many regions (Amakiri, 2000). Therefore most deaths in these countries are not autopsied which is likely to result in significant undercounts of homicides. In a few countries, principally South Africa, all deaths due to non-natural causes require examination which is increasingly often done; this could emphasize the frequency of non-natural deaths including homicide, over natural deaths for which an examination is not required.

Even though research in Sub-Saharan Africa on homicides was uncommon and isolated through the 1970's, 80's and 90's, it did exist. This review examines the research about homicide organized by sex, age, mechanism of injury, and civil unrest.

Sex

In an area near the Mozambique border, in South Africa, a low-income population of 60,000 in 20 villages was followed prospectively starting in 1992 (Garenne, Kahn, Tollman & Gear, 2000). About a third of the population was comprised of refugees from

the Mozambiquan war of independence. The age-standardized homicide rate per 100,000 for the years 1992-1995 was very high at 41.9/100,000 – that is 74.2 for males and 17.9 for females; this unusually high homicide rate is close to the Reza, Mercy & Krug (2001) estimate for all Africa (40.2/100,000 total - 69.8 for males and 11.2 for females).

Twenty studies reported the number of males and females killed from which ratios can be calculated (see Table 2.2). Ten of these used data from South Africa including six from Cape Town.

In these studies males were four to ten times more likely than females to be murdered. The only male:female ratios that were close to one were based on a small number of homicides (n=11) (Amakiri, 2000) or of children under fifteen years (Knobel, De Jilliers, Parry & Botha 1984). The ratio is especially high when large numbers of deaths are due to civil unrest (Duflou, 1986; Duflou, Lamont, & Knobel 1988). It is possible that the high male:female ratios of death are partially attributable to migration patterns. For example men migrating to the city (where most surveillance is done) in search of work leaving the women behind in rural areas may account for the higher proportion of adult males listed in the death registers than would be expected from life tables (Dgedge, Novoa, Macassa, Sacarlal, Black, Michaud & Cliff 2001).

Only one paper reports on male perpetrators. In Kaduna State, Nigeria, during 1983-1987, a place and time in which knives were commonly carried by men, 408 murders were reported. Seventy-two perpetrators in prison custody on January 1988 were interviewed by psychiatrists (Ogungbemi & Ahmed 1993). Ninety four percent of the perpetrators were male. Ninety two percent were between the ages of 20 and 40. Thirty percent were unemployed and another 18% were ex-military. Eighty four percent

of the victims were relatives or friends of the perpetrators. One fifth of the murders were committed for reward (economic, criminal, or psychological) or as a result of mental illness; 80% of the murders reported were for "socially acceptable" reasons that included provocation (48%), alleged accident (22%), and self defense (10%).

Research examining pregnancy-associated mortality in Maputo Central Hospital of Mozambique's capital city between 1992-94, found that about 4% of deaths (10) were due to homicide (Granja, Zacarias & Bergstrom, 2002). In a retrospective study of a nationally representative sample gathered from 1999 mortuary death registers in South Africa, it was estimated that there were 3798 female homicides, half of whom were killed by an intimate partner (femicide) (Mathews, Abrahams, Martin,,Vetten, van der Merwe, & Jewkes, 2004). This femicide rate of 8.8/100,000 women over 14 years of age is the highest rate ever reported. Two percent of the female murder victims were pregnant, which is less than would be expected by chance (i.e. Women aged 15 - 45 years with expectancy of five term pregnancies would experience 45 pregnant months of 360 life months = 12.5%). In 15% of the homicides the victim had been sexually assaulted. Women killed by intimate partners were more likely to be younger, be domestic workers, killed in their own homes, and to be killed by a perpetrator who had a history of alcohol problems.

In Senegal, a country where not being a mother "c'est mourir definitivement" is the definitive death..." a qualitative study was conducted including 33 women accused of infanticides during the years 1968-1994 in the capital city (Menick, 2000, p.1565). The women had been sent by the courts for evaluation at the Psychiatric Clinic of the main hospital. All the women who committed infanticide were under 40, and single: 16 of the

women had never married, 9 were divorced or widowed and the 14 wives were married to emigrants. Ninety seven percent were declared mentally sane. Infanticide, a rare occurrence, was viewed as a defense against exclusion from the community through moral rejection by society or social death ("le rejet ou la mort sociale").

Age and proportionate mortality

In a population based prospective survey in Kenya, of the deaths of 251 children under-five, during 1985-1988, homicide was not mentioned (Mirza, Macharia, Wafula, Agwanda, & Onyango, 1990). Likewise in South Africa, Wyndham (1984) attempted to determine the ten leading causes of death among children under 5 years old for 1970; assault did not appear in the ranking for any racial group. In Mozambique homicide was not in the top ten causes of death for children in the 0-14 age group (Dgedge, Novoa, Macassa, Sacarlal, Black, Michaud & Cliff, 2001).

Witchdoctors have been known to murder children to be used as "medicine". A case study describes a rare "muti"(medicine) or ritual murder in Western Cape, South Africa, of a 5-year old black boy in 1994 (Scholtz, Phillips & Knobel 1997). The traditional healer, a frequent patient at the local mental hospital was declared unfit for trial; the assistant after being acquitted, returned to his community where he was "necklaced" with a tire, dowsed with petrol and burned.

A retrospective study retrieving the causes of non-natural deaths of children under the age of 15 years between 1966 and 1991 was compiled from the Official Death Register of the South African police (Knobel, De Jilliers, Parry, & Botha, 1984). Death from assault or abuse was 5.4% of the non-natural deaths. Kibel, Joubert and Bradshaw (1990a, 1990b) reviewed the 1981-1985 registers for all South African injury-related

mortality in children under fifteen years. Rates for black Africans were not even calculated since it was known that the death and population data were underestimated and the authors believed that the resulting bias would be impossible to predict. Of injury deaths the percentage due to assault was 12% in infants, 5% in children 1-4 years, and 6% in children 5-14. "Colored" children had higher assault mortality rates than whites or Asians.

In another study using South Africa's death registry data, Flisher, Joubert & Yach (1992) extracted data for the 3-year period 1984-1986 for adolescents 10-19 years, thus overlapping much of the data collected by Kibel et al. (1990a, 1990b). For those aged 10-14 the proportionate mortality rate due to assault within racial groups ranged from 6.3 for Asians to 11.3 for Africans. Among ages 15-19, the proportionate mortality ranged from 5.9 for whites to 44 for Africans and 47 for people classified as colored. A retrospective study of Cape Town hospital, mortuary and police record data was conducted in order to determine the profile of firearm injuries and deaths among children and adolescents (Wigton, 1999). Homicides of adolescents constituted about 19% of all deaths.

Lerer (1992) found that the median ages of the 216 female homicides in 1990-1991 in Cape Town were 29.5 years for African, 35 years for colored and 63 years for white women.

In Ife Nigeria, an agrarian region, records of 202 cases of homicide in the years 1977-1988, were examined (Nwosu & Odesanmi, 1998). Peak age of victims was 20-40 years. In 1994, in Maputo City, Mozambique, analyzing 9011 deaths recorded in the death register, representing coverage of approximately 86%, it was found that for adults

15-59 homicide was the fifth most common cause of death (proportionate mortality 6.5) (Dgedge et al., 2001).

The Adult Mortality and Morbidity Project (AMMP) measured the rates and causes of morbidity and mortality of people living in 3 different communities in Tanzania, one urban (N=64,756 in Dar es Salaam) and two rural (N= 146,359 in Hai and 103,053 in Morogoro)(Moshiro, Mswia, Alberti, Whiting, Unwin & Setel 2000) (see Table 2.3). The AMMP's population-based demographic surveillance was almost certainly the most accurate mortality data being collected in Sub-Saharan Africa.

In the years 1992-1998, the AMMP surveillance showed that the average age adjusted rate of homicide deaths for females was 3.4/100,000/year and for males it was 16.5/100,000/year. Children living in the major city of Dar es Salaam are safer from homicide death than those living in rural areas. Women also appear to be protected in Dar es Salaam until they become very old. Among men, the overall homicide rates are the same in city and rural areas.

It would be ideal to be able to compare these figures to those of other countries. But the reported age groupings vary and usually population figures are not given, so it is not possible to do so.

Mechanism of injury, weapons

Studies from Nigeria focus on the mechanism of injury. A retrospective study of 375 consecutive medicolegal cases seen at 4 hospitals in rural Rivers State of Nigeria over a 5 year period 1984-1989 included 11 homicides or 2.9% of the medico-legal case total (Amakiri, 2000). One 10-month old boy had been found interred with no bone injury. All the women died from beatings with clubs and sticks, while only one man died

from blunt force, 2 from gunshot, 1 from stab wound, and 1 from a machete cut and tetanus.

Likewise in South Africa Lerer (1992) found that women were killed by guns less frequently than men, more often succumbing to blunt force. Of the 216 female homicides of Cape Town 1990 and 1991, half were killed with knives, 42% by blunt objects, and 9% by firearms.

In Benin City, considered the "most notorious zone for armed banditry in Nigeria", a prospective study of coroner's autopsies was undertaken (Aligbe, Akhiwu & Nwosu, 2002,p.324). Of 138 cases of homicide, 26(19%) were considered justifiable, being cases of armed robbers killed by police; the remaining gunshot victims were considered murder by armed robbers. Sixteen victims (14.3%) died from stab wounds attributed to "student cultism" at Nigerian universities.

Autopsies were done on 495 Cape Town homicide victims in the first 6 months of 1986 (Duflou, Lamont, & Knobel, 1988). The most common weapon was sharp. Firearm injuries were uncommon except during civil unrest. All those who were burned also had evidence of blunt object injury. Nine other cases included strangulation (4), poisoning (2), and 2 "muti" murders of young children by traditional healers.

When Lerer examined fatal burn injuries (1994) in 1991-1992, in Cape Town, South Africa, it was found that 10% (34) of fatal burn injuries were homicide-associated, less than 2% of total homicides. Ante mortem injury was found in 82% of the corpses and soot in the trachea was not found in more than half indicating that they were dead before being burned. Wire or rope was found around the limbs of 7 of the 34. Five were

necklacings, a murder technique first reported in 1984. In both groups about half of the victims were found to have had blood alcohol concentrations above 0.10 g/100 ml.

The studies reviewed here reveal that the mechanism of injury most commonly resulting in homicide is sharp weapons (see Table 2.4). During periods of unrest, mostly as a result of police and security force action, firearm injuries increase. It seems that Nigerians resort to firearms more than South Africans. There may be a trend in South Africa towards increasing use of firearms.

Civil unrest – political struggle

Many African countries have fought to throw off colonialism. It is well known that South Africa has had a unique political history and that the effort to overthrow apartheid was prolonged. Most studies on the mortality of violence and civil unrest in SSA are from South Africa.

Knobel (1986) analyzing data obtained from the official death register of the South African Police Mortuary for a 10 year period, was able to trace periods of civil unrest through mortality. From 1976 to 1985 the average number of people killed by police per year in RSA was reported at 786. When a State of Emergency was declared in 1985, 870 people were killed by police and security forces. Sixteen police and security forces were also killed. In that year autopsies were done on 87 cases of the 128 who were killed in Capetown, during episodes of political violence (Duflou, 1986). More than half of the civil unrest group were shot in the back. Alcohol was detected in 19% of the 63 victims whose blood was tested.

In South Africa at the end of the apartheid struggle in 1994, homicides constituted 30% of all deaths and most homicides occurred in the 15-35 age group (Lerer,

Matzopoulos & Phillips, 1997). The most recent report of the South African National Injury Mortality Surveillance System included coverage of about 35% of all non-natural mortality; homicide was still the major cause of death accounting for 44% of all injury death.

However there is hope that the peak of violence may have passed in South Africa and that with the end of apartheid, violent trends will decrease. Trends of death were studied at the level one Johannesburg Hospital Trauma Unit (JHTU) for the years 1985-2001 (Bowley et al., 2002). The number of unnatural deaths investigated at JHTU has declined approximately 19% from a total of 4319 in 1996 to 3488 in 2001. However the number of gunshot related fatalities has remained stable; therefore the ratio of gunshot related fatalities has risen from 25% in 1996 to 29% in the year 2001. Figures published by the South African Police service show a very strong upward trend of many crimes since 1998, although three crime trends, namely murder, attempted murder and arson have decreased recently (Crime Information Analysis Center, 2004).

The struggle that continued over decades is reflected in the homicide rates. As civil disturbance to end apartheid accelerated so did homicide as a proportion of all deaths. Figure 2.1 shows that South African murder rates following Independence in 1994 have steadily declined according to the police (Crime Information Analysis Centre, 2004). The decrease in murder incidence between the end of apartheid in 1994 and 2003 was 29.5%. This is contrary to world-wide trends, and made especially remarkable in that it occurred at a time when per capita income was decreasing.

Discussion

A few tentative patterns about homicide in Sub-Saharan Africa can be gleaned from the studies reported above. Most clear is that far more males than females were murdered. The data in Table II are consistent with the estimate based on the *Global Burden of Disease Report* (Murray and Lopez, 1996) that in SSA the male : female homicide ratio was 6.2 : 1. Another general pattern is the relationship between victim age and risk of homicide. Children are largely protected from homicide. Consistent with what Reza et al. (2001) reported worldwide, the rate of homicides increases abruptly in the 15 to 19 year age group, peaks in the 20-29 age group, remains high until age 44 years, and then declines. Probably the most common weapon is a knife or a panga, but because the data is sparse it is not possible to be more definitive. However female homicides are probably more frequently due to blunt objects than male homicides. In times of civil strife, homicide due to firearms increases. Deaths due to firearms may be increasing. Overall, homicide seems to be decreasing in South Africa.

From the research thus far, basic questions such as proportionate mortality, ethnic or national differences, occupations of the deceased, place of death, precipitating factors, relationship of the perpetrator to the victim, and temporal trends cannot be ascertained.

Virtually all of the studies reviewed have noteworthy deficiencies. Most are based on the fewer than 1% of deaths that are registered in Africa (e.g. Kibel et al., 1990; Dgedge et al., 2002; Knobel et al., 1984; Knobel, 1986; Muniu et al., 1994; Byarugaba & Kielkowski, 1994; Couper & Walker 1997). Many of the studies are hospital mortuary-based (e.g. Aligbe et al., 2002; Amakiri, 2000), in areas where most people do not have access to hospital care it is impossible to decipher their significance. In addition, blood

testing for poisoning has rarely been done; in the papers reviewed, the only poisoning cases were 7 admitted by Nigerian perpetrators (Ogungbemi & Ahmed, 1993) and 2 in South Africa (Duflou et al., 1988).

Results from these studies were commonly reported without context. For example, the number of people killed was reported but not the baseline population from which they were drawn. Often raw data are not given. Reported age groupings, and definitions of mechanism of injury vary.

Data were often too amalgamated to be very useful. For example some studies classified their data by external cause of death and did not differentiate between accidents, poisoning, and violence (e.g. Mirza et al., 1990; Flisher et al., 1992). Some data aggregated accidents and suicide or violence, making it impossible to gain a clear understanding (Byarugaba & Kielkowski, 1994; Garenne et al., 2000; London et al., 2002,).

These studies demonstrate the need for standardizing strategies of reporting and expanding data collection. South Africa with support from the USA Centers for Disease Control and Prevention (CDC), pioneered surveillance methods of injury morbidity and mortality for low-income countries. Much of what is being learned in South Africa is being further developed at WHO in the Violence and Injury Prevention Department (WHO-VIP) (Butchart et al., 2001). Standardized measurement instruments including the Injury Surveillance System (Holder et al., 2001) and *Guidelines for conducting community surveys on injuries and violence* (Sethi et al., 2004), have been developed to be used in settings with few computers or trained manpower.

These quantitative instruments can be adapted to diverse circumstances and are sufficient for obtaining immediately useful results. It may not be possible, for various reasons, to build continuous violent death surveillance systems in many SSA countries in the near future. However, it could be logistically more feasible to have periodic (say, every five years) year-long quantitative violent death surveillance representing diverse parts of Africa that would indicate trends.

With the violent death surveillance system it is possible to identify and follow homicide trends. It is a potentially useful tool with which to monitor areas of increasing violence. The surveillance system can also be used to identify places with relatively few homicides such as Tanzania. As well, interventions by governments and non-governmental organizations not yet reported in the academic literature are occurring in SSA. The surveillance system could be used for example to monitor the effect of the important governmental and NGO interventions in the Great Lakes Regions.

Perhaps the most significant gaps are the circumstances surrounding homicides in Sub-Saharan Africa and the absence of data on risk and protective factors. The Household Questionnaire (Sethi et al., 2004) is an attempt to arrive at an instrument that can begin to answer some of those questions. It is important to sort out which are culturally instructive and which are imposed by national and international geo-political forces.

Through the research reported here, some important trends have already been identified which deserve immediate in-depth research. It would be useful to discover how and why women and children in Africa have a relatively low rate of homicide death compared to other parts of the world. It is crucial to understand how the realms in which

the individual lives, the family, community, society and nation state can by harnessed in such a way that those most at risk for homicide death - male youth - are enabled to contribute to the increased well-being of the whole. Surveillance is necessary but insufficient to fully answer questions such as these.

Butchart et al. (2002, p.805) suggest qualitative research is needed to explore "the anthropology and sociology of interpersonal violence in settings with low- and high-economic inequalities to reveal the social realities that sustain patterns of violence." Qualitative research is needed to reveal the unexpected and empower the voices of those not often heard (Lemke et al., 2003).

These suggestions imply the need for increasingly strong local capacity to monitor and evaluate, a way that public health professionals can effectively participate with government and NGO interventions towards the common goal of a more civil society.

Conclusion

In summary, little research has been done on violence including homicide in Sub-Saharan Africa and little is known. Even less is known about how the pockets of relative peace that exist, are created, and maintained. However momentum is building to explore these issues.

Much of the next generation of research, quantitative and qualitative, will be coordinated and shared through the World Health Organization in such a way that a body of knowledge can be built that will help to "ensure a more peaceful world for future generations" (Reza, Mercy & Krug, 2001, p.111).

Table 2.1

Worldwide 1990-2020, Projected Change in Rank Order of 15 Leading Causes of Death

1990	Rank	2020
Disease or injury	Order	Disease or injury
Ishemic heart disease	1	Ischemic heart disease
Cerebrovascular disease	2	Cerebrovascular disease
Lower respiratory infections	3	Chronic obstructive pulmon'ry disease
Diarrheal diseases	4	Lower respiratory infections
Conditions of perinatal period	5	Cancers of trachea,lung & bronchus
Chr. obstructive pulmon'ry disease	6	Road traffic accidents
Tuberculosis	7	Tuberculosis
Measles	8	Stomach cancer
Road traffic accidents	9	HIV
Cancers of trachea, lung & bronchus	10	**Self-inflicted injuries**
Malaria	11	Diarrheal diseases
Self-inflicted injuries	12	Cirrhosis of the liver
Cirrhosis of the liver	13	Liver cancer
Stomach cancer	14	**Homicide**
Diabetes	15	**War**

Note: From Murray, C.J.L. & Lopez, A.D. (Eds.) (1996). *Global Burden of Disease Report.* Harvard, World Health Organization and World Bank.

Table 2.2

Sub-Saharan Africa 1970-2004, Homicide Death, Male: Female Ratios

Country, region	Author	Years	Homicide(n)	Male:Female
Sub-Saharan Africa	Reza et al.	estimate		6.2
Nigeria, Ife	Nwosu & Odesanmi	1977-1988	202	4.6
Rivers State	Amakiri	1984-1989	11	1.2
Rivers State	Seleye-Fubara & Etebu	1986-2000	610	6.0
Jos	Mohammed et al.	1995-1999	101	7.4
Benin City	Aligbe et al.	1996-1997	138	4.9
Kenya, Nairobi	Muniu	1986-1990	259	9
Tanzania, 3 regions	Moshiro et al.	1992-1998	not given	4.8
Mozambique, Maputo	Dgedge et al.	1994	188	8
South Africa	Wyndham	1970	3782[a]	6.2
South Africa	Flisher et al.	1984-1986	2555	8.5
South Africa	Matzopoulos	2001	~ 28600	6.6
Soweto	Byarugaba & Kielkowski	1990-1991	1470	9.6
Cape Town	Knobel et al.	1966-1981	174[b]	1.3
Cape Town	Duflou	1984	93	14.5
Cape Town	Duflou et al.	1986	495	8.4
Cape Town	Lerer	1990	1320	6.7
Cape Town	Lerer	1991-1992	34	5.8
Cape Town	Lerer et al.	1994	1789	6.8

[a] 15-19 years old [b]<15 years old

Table 2.3

Tanzania 1992-1998, Assault Rates per 100,000 by Age, Sex, and Area

	DSM (u)		Hai (r)		Morogoro (r)	
Ages	Male	Female	Male	Female	Male	Female
0-4	0	0	3.1	7.8	2.4	0
5-14	2.5	0	1.6	2.5	1.2	2.4
15-59	26.4	2.6	28.7	6.0	1.2	2.0
60+	0	23.8	19.0	5.5	24.2	9.2
All ages	16.8	2.1	16.1	5.3	16.6	2.8

Note: From Moshiro, C. Mswia, R., Alberti, K.G.M.M., Whiting, D.R., Unwin, N. & Setel, P.W. for the AMMP Team (2000). The importance of injury as a cause of death in Sub-Saharan Africa: Results of a community-based study in Tanzania. *Public Health, 115,* 96-102.

u – urban r - rural

Table 2.4

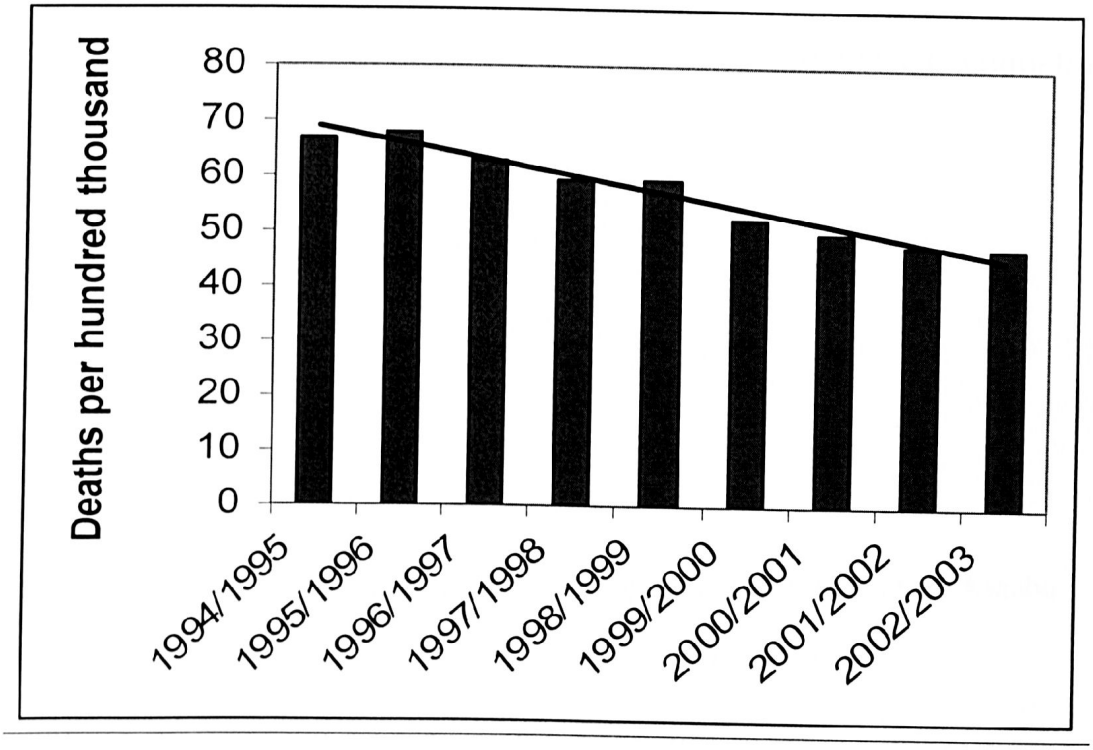
Africa Region, Homicide Death, Mechanism of Injury, Percent by Study

Country region	Years	N	Bodily force	Blunt	Sharp	Fire	Firearms	Other
Nigeria								
Ife	1977 -1988	202		18	35		37	10
Rivers State	1984 -1989	11		55	18		18	9
Kaduna	1983 -1987	72	15		67		8	10
Jos	1995 -1999	101	21		47	5	28	
South Africa								
Cape Town	1976 -1985	3931		26	63		11	
Cape Town	1986	495[a]		22	6	5	18	2
Cape Town	1991-1992	34		42	49		9	
Cape Town	1994	1789		13	52	0.04	26	8.6

[a] More than one cause of death was given for 30 victims.

Figure 2.1

South Africa, Murders per 100,000 Population, by Year with Trend Line



Note : All data from Crime Information Analysis Centre (2004). South Africa Police Services Annual report 2002/2003. Retrieved July 2004 from http://www.saps.gov.za. Except 2002/2003 from Norman, R., Matzopoulos, R., Groenewald, P. & Bradshaw, D. (in press) The high burden of injuries in South Africa. *Bulletin of the World Health Organization.*

Homicide surveillance in Dar es Salaam, Tanzania 2005:

A Low Income Setting Implementation of the WHO/CDC Guidelines

by

Anne H. Outwater, Jacqueline C. Campbell, Linda E. Rose, Lina Kinabo,

Edward Mgaya and Edith A.M. Tarimo

Abstract

The World Health Organization has recommended the establishment of violent injury morbidity and mortality surveillance systems in low and middle income countries. In 2005, a study was conducted in Dar es Salaam region (DSM) Tanzania (TZ) to accurately quantify the rate of violent death and describe the circumstances and those who died from homicide. This study was a preliminary implementation of the WHO/CDC *Injury Surveillance Guidelines* (Holder, Peden, Krug, Lund, Gururaj, & Kobusingye, 2001).

Methods

Twelve quantitative variables and one open-ended question were chosen for data collection using the surveillance guidelines. A triangulation mixed methods design was used with quantitative and qualitative data collected concurrently at the Muhimbili National Hospital mortuary.

Results

The *Guidelines* proved clear, suitable and usable for this resource poor setting. A new code of "mob violence" was conceptualized, operationalized and added to the variable of intent, showing the adaptability of the surveillance system to specific contexts.

Discussion

The study importantly provides a methodology for reporting violence related deaths in an economically poor setting. The surveillance system and the knowledge gained will serve as a foundation for further training and research. Using mixed methods

allowed the qualitative data to support, inform and enrich understanding of the quantitative data.

Conclusion

This study demonstrated the usefulness and potential of ongoing monitoring of violent deaths in DSM as recommended be done globally by WHO. Mixed methods research allowed the emergence of a new code, mob violence, which is important to recognize in order to develop category and context specific prevention strategies. It is suggested that a passive surveillance system be incorporated into the daily routines of the Mortuary.

CHAPTER 3

Homicide surveillance in Dar es Salaam, Tanzania 2005: A Low Income Setting Implementation of the WHO/CDC Guidelines

Globally, violence is an important health problem. Homicide, since it is the most obvious and easily quantifiable manifestation of interpersonal violence, is often used as a marker for overall violence. The World Health Organization (WHO) *World Report on Violence and Health* (WRVH) reports that violence disproportionately affects low and middle income countries (Krug et al., 2002). However, limited data are available on the distribution, incidence, or temporal patterns of homicide in low and middle income countries (Krug et al., 2002).

Previous research

In Africa, publicly available statistics are uneven and often unreliable; less than 1% of deaths are registered (Holder, Peden, Krug, Lund, Gururaj, & Kobusingye, 2001). Peer-reviewed and published literature is limited; from 1970-2004, fewer than 40 peer review articles mentioned homicide in Africa (Outwater, Campbell, Webster & Mgaya, 2007). While Africa is believed to be the world's second most violent continent, it is not understood whether most homicide deaths are committed by groups of individuals or are interpersonal in nature (Kobusingye et al., 2007).

In Tanzania (TZ), owing to poorly developed official health and crime information systems, potential data sources such as death certificates, vital statistics registries, and police records were not available to researchers. Mortuary records were

theoretically available, but it was not known if they were complete, and the variables relevant to research within them were few.

In TZ, an initial profile of interpersonal violent death as part of the larger disease burden was described through a population-based study in 3 of Tanzania's 26 regions from 1992-1998, the Adult Morbidity and Mortality Project (AMMP). In Dar es Salaam (DSM), AMMP's survey took place in households including 64,756 people in 3 wards, (of an overall population of 2.84 million in 73 wards). It was not known if these data were accurate or representative. Moreover, the reported data were insufficient beyond estimates of proportionate mortality and overall mortality rates by sex and broad age groups (Moshiro, Mswia, Alberti, Whiting, Unwin, & Setel, 2000).

Surveillance

Epidemiological surveillance is an important and basic public health strategy. It is the ongoing and systematic collection of records on individual cases, analysis and interpretation of health data in the process of describing and monitoring a health event (Klaucke, Buehler, Thacker, Parrish, Trowbridge & Berkelman,1988). Gordis (2000) expands the definition to include the ultimate purpose: information used for the implementation and evaluation of interventions and dissemination of results. Injury surveillance as defined by Centers for Disease Control is "the ongoing systematic collection, analysis, and interpretation of injury data, for use in planning, implementation and evaluation of prevention activities (Espitia-Hardeman & Paulozzi, 2005). Research methods drawn from behavioral and health sciences are increasingly being used in surveillance (Butchart, Phinney, Check & Villaveces, 2004).

The first step of what is often called the public health approach is gathering data surveillance (Sethi, Marais, Seedat, Nurse & Butchart, 2004). The preliminary step defines and describes the magnitude, scope and characteristics of the problem including rates and risk of new cases, demographic characteristics of the victims and perpetrators, the mechanisms of injury, and the temporal and geographic characteristics of violent incidents. The second step involves identifying risk and protective factors. Risk factors are those that increase the probability of a person becoming a victim or perpetrator of violence; protective factors are those that decrease the risk. Based in large part upon information obtained from the previous steps, the next step aims at developing and testing interventions. The final stage is the implementation of interventions that are likely to be effective.

There are two types of surveillance: passive and active (Gordis, 2000). Passive surveillance denotes surveillance in which already available data are used. The responsibility of gathering these data often falls upon available staff and the generation of the data may not be the primary function of the system that yields the data (Holder et al., 2001). The completeness of the data depends on the individuals involved who may view surveillance as peripheral to their primary responsibilities. Active surveillance denotes a system in which individuals have been specifically employed to carry out the responsibility. It may involve interviewing patients, families, or staff, and reviewing medical records. Reporting is generally more accurate in active surveillance but it is more expensive to maintain.

In addressing the problem of scant data in low and middle income countries throughout the world, the World Health Organization with support from Centers for

Disease Control (CDC) is supporting in-country capacity development for injury surveillance. The *Injury Surveillance Guidelines* (Holder et al., 2001) are part of this process. The Guidelines describe how to set up a basic system for collection of data on injuries. The Guidelines are designed for use in places with few economic resources for data surveillance. They can be implemented without computers. Data gathered through these Guidelines are comparable internationally.

With the goal of decreasing injury burden, WHO's Department of Injury and Violence Prevention (WHO-VIP), recommended that the first priority "must be given to putting in place systems for collecting data on all known and suspected violence and injury-related deaths." The data collection priority identified was, mortality due to violence (Butchart et al. 2004). WHO recommended that, research focus first on defining the problem by addressing questions on the magnitude and types of violence.

Therefore, a violent death survey took place in Tanzania's most prominent region, DSM, to create an accurate profile of the problem in 2005. For this first implementation of the WHO *Injury Surveillance Guidelines* exploratory study, active surveillance was chosen to ensure comprehensive and complete results.

Mixed Methods Research

Violent death is the result of complex forces (Krug et al., 2002). Research on violent death must be able to address multiple levels of influence (Ford-Gilboe, Campbell, & Berman, 1995; Johnson & Onwuegbuzie, 2004;). Researchers are increasingly aware of the inherent benefits in merging qualitative and quantitative methods (Johnson & Onwuegbuzie, 2004). Using mixed methods may be especially important in exploratory research such as this. Surveys are generally most useful when

gathering descriptive and normative data, and not as useful when exploring new ideas or for capturing rich data (Fowler & Mangione 1990). Wilson and Medard (1994) conducting research in Tanzania suggested that survey questionnaires for unknown populations should not stand alone but be augmented with qualitative data to clarify interpretation and support conclusions.

One of the goals of mixed methods research is to draw upon the strengths and minimize the weaknesses of both qualitative and quantitative data (Creswell & Plano Clark, 2007). Those who use mixed methods focus on collecting, analyzing and combining both quantitative and qualitative data in a single study or series of studies. Mixed methods approaches allow a researcher to measure trends, prevalence and outcomes and at the same time examine meaning, context, and process. The central premise is that quantitative and qualitative approaches in combination, provide a better understanding of research problems than either approach alone (Creswell & Plano Clark, 2007).

Therefore this study used mixed-methods. Quantitative data were collected on specific variables through close-ended questions and qualitative data were collected through an open-ended survey question and participant observation.

Setting

The study was undertaken at Muhimbili National Hospital Mortuary (MNH) to where all police mortality cases (including homicide, suicide, motor vehicle accidents, and deaths of unknown causes) were brought. MNH is one of the largest consultant hospitals in TZ and main teaching facility for Muhimbili University College of Health

Sciences (MUCHS). In addition, attendants from other mortuaries in Tanzania come to MNH for practical training on storage of the deceased, embalming, and record keeping. The Mortuary is an important cog in the workings of the city. Here, nurses, police investigators, physicians, mortuary attendants, city government, and students from other mortuaries, intersect with the entire range of the public.

In 2005, all medico-legal autopsies from DSM (approximately 1500) were conducted at the MNH mortuary. In DSM, by law, before a burial certificate can be obtained, homicide and suicide cases must be certified by a pathologist, police officers and when known, close kin in attendance with the corpse. Details on all corpses entering the mortuary are registered in one of four hand-written ledgers using information collected from the Police or next of kin. Information on all those who died from violence or an unknown cause is recorded in Mortuary Registration Ledger dedicated to "Police Cases" and includes: an identification number, name, sex, age, residence, place of death, cause of death, and next of kin. Cases are linked to their post-mortum report through consecutive numbers.

The study was conducted by a multi-disciplinary multi-lingual team with cross-cultural expertise, including members from the Johns Hopkins School of Nursing, and the MUCHS faculties of Nursing, Medicine and Public Health. The gatekeeper to the site was the Mortuary Manager who became a full partner in the research.

Research Design

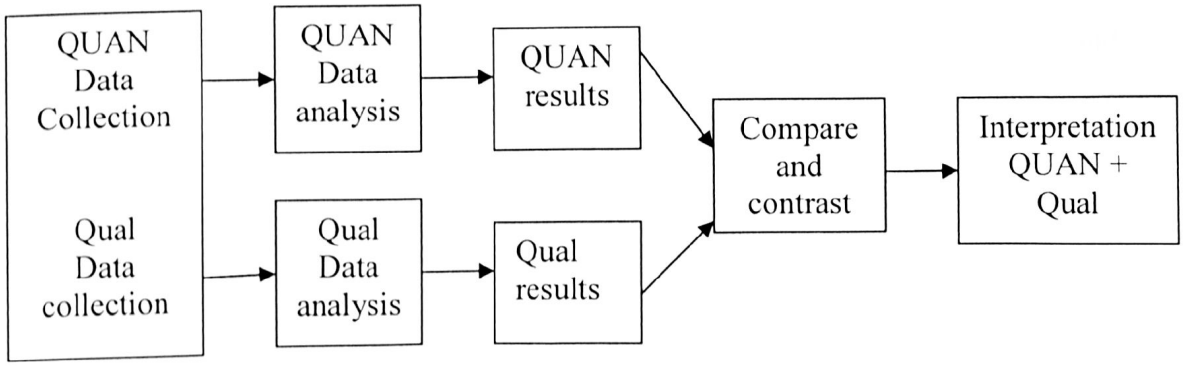
This study was designed as a foundation upon which to build an ongoing surveillance system. The objectives of the investigation were to: (a) discover the demographic characteristics of those who died, (b) the temporal and geographic features

of the incident, (c) the circumstances under which the event occurred, (d) the victim/perpetrator relationship and (e) accurately quantify the rate of violent death in DSM The objectives of this paper are to describe how the methods were implemented and adapted to the Tanzanian context and also, show how a potentially important new code, mob violence, for the quantitative variable of 'Injury Intent', emerged. The findings related to the new code will be presented and discussed as showing the adaptability of the surveillance system guidelines, as well as illustrating the need for contextually specific surveillance categories that can guide specific homicide prevention strategies.

This design was a cross-sectional mortuary based survey using mixed methods. A variant of the triangulation design as described by Creswell & Plano Clark (2007) was used (see Figure 3.1 below). Some data, such as comprehensive statistics, and organization of places of residence and injury can only be captured through quantitative methods. The emphasis in this study was on this study was the quantitative survey. The qualitative data added understanding by illuminating some of the important contextual factors of the homicide event.

Figure 3.1

Triangulation Design: Convergence Model



Both quantitative and qualitative data were collected with one survey instrument which consisted of twelve quantitative variables followed by one open-ended question. The qualitative data had a supporting role for the quantitative. Ideally the purpose of collecting qualitative data would be to clarify meanings in the quantitative analysis, cross-validate findings and inform plans for intervention in a next step (Creswell & Plano Clark, 2007). However the qualitative data gathered in this exploratory study were limited in scope and depth and could not expect to provide the completeness of in-depth interview qualitative data. The qualitative data were expected to inform understanding of some aspects of the quantitative statistical results. Data sets were analyzed and results presented separately. Data sets were then compared and contrasted, and merged during interpretation.

The researchers were alerted to the possibility of an unrepresentative data set as a result of missing or inaccurate entries (Butchart et al., 2001; Mutasingwa et al., 2001), so the data were also triangulated. The general principle of data triangulation is the collecting of information from a diverse range of individuals and settings using a variety of methods (Denzin, in Maxwell, 1996, p.75). Multiple sources and types of data reduce the risk of bias, and increase the likelihood of accurate data. Data were triangulated through discussions with the pathologists, mortuary attendants, and police assigned to the cases; post mortem reports; interviews with friends and relatives of the deceased; and participant observations at the Mortuary which included visual autopsies, that is, external examinations or visual inspection of the body without the taking of a blood sample.

Method

The sample was fixed as all those who died a homicide death within the geographical area of DSM region in 2005. Population denominators were calculated by taking the reported mid-year population of 2002 (Republic of Tanzania, 2003), and adding the average annual population growth of 4.3%/year (Years 2003+2004+2005).

By law, all injury deaths were supposed to be taken to the central mortuary at Muhimbili National Hospital, but even the Regional Medical Officer did not know if this was consistent practice. To ensure that each victim of injury death was included in the sample, the city's six minor mortuaries and seven major police posts were monitored bi-weekly. Only the mortuary at the Lugalo Army Base refused monitoring, for reasons of national security. The point person at the other mortuaries were the District Medical Officers based at the hospitals.

Data Collection Instrument

A similar instrument to the one used in this study was piloted in 1998 in South Africa (Butchart et al., 2001). After more than 6000 injury deaths were registered, sensitivity was assessed in the different mortuaries. Results varied: sex was recorded correctly 96-100% of the time, age 37-84%, and manner of death 65-95%. Positive predictive value (the likelihood that an event actually occurred) was also measured, and ranged from 74-80% for manner of death and 71-82% for mechanism of death. Upon scrutiny it was found that the inconsistencies were a result of staff making assumptions on the basis of the cause of death and incorrect classifications. It was found that training requirements were minimal and the system was simple for staff to operate.

In TZ, in-hospital medical records of 1098 cases from four hospitals (including MNH) were analyzed (Mutasingwa & Aaro, 2001). The following variables were

routinely recorded in case notes: gender (100%), nature of injury/principal diagnosis (99.6%), body part injured (99.4%) and age (96.4%). The study concluded that there was a need for improving the way injuries are recorded in hospitals. But considering that the records had not been set up a priori for the rigors of research or systematic surveillance, the relative completeness of important variables was encouraging.

In Uganda, Kobusingye and Lett (2000) piloted a system of Minimum Data Sets for non-fatal injuries as described in the *Injury Surveillance Guidelines (*Holder et al. 2001) (see Figure 3.2). It was found "possible and useful" in the Africa region and recommended "for investigators with similar resource constraints".

For this study, all members of the research team had input into the coding of the variables and development of the instrument format. Because we were not sure that the close-ended response choices would exhaust the range of answers, codes 'other' and 'describe other' was added to all close-ended questions. Questions were organized in a logical order. The least emotional questions were asked first, starting with a basic description of the deceased, leading to questions about the cause and reason of his death. Questionnaire length and format were expanded to include ample area for responses to the final open-ended question: Is there anything else you would like us to know.

Variables

The variables used in this study (see Table 3.1) included all those recommended in the Minimum, Optional and Supplementary Data Sets of the *Injury Surveillance Guidelines* (Holder et al, 2001), except two (86%). Time of injury death was not included because it was believed the data gathered would be inaccurate. Data on alcohol or other psychoactive drug use were not gathered because of lack of cooperation at the National

Laboratory (who are mandated to test all cases of accidental or violent death) due to lack of funds.

The 12 quantitative variables collected were: sex, year of birth, date of death, place of residence, place and site of death, occupation, role of human intent in the occurrence of the injury, activity at time of death, cause of death/weapon(s) used, events leading up to the death, and relationship of perpetrator to the deceased.

Descriptors of the variables were modified to fit the context through discussion with the research team and other experts in Tanzania. To derive meaningful analysis for the variable 'Occupation', codes were interfaced with Tanzania's *Integrated Labour Force Survey* (Republic of Tanzania, 2002), and South Africa's *Epidemiology of non-fatal injuries in Johannesburg-Soweto* (Butchart et al., 1991).

The qualitative data were collected via the Incident Summary indicated in the Optional Data Set (Holder et al.,2001) (see Figure 3.2) which was interpreted as an open-ended Summary Statement which respondents could answer flexibly, emphasizing what they wanted to share. Respondents were asked: *Kuna kitu kingine mngetaka sisi kujua?* Is there anything else you would like us to know? (Respondents were usually, but not always, family members: see Field Testing for description.)

Translation

Languages are profoundly different in structure, vocabulary and emphasis. Translation is increasingly important as cross-language studies increase yet "no aspect of cross-national survey research has been less subjected to systematic empirical investigation than translation" (Smith, 2004).

Harkness, Pennell, and Schoua-Glusberg (2004) and Smith (2004) suggest that team approaches bringing different types of expertise and skills, including linguistic and cultural knowledge to bear on the translation are preferable to single translators and back translation. Back translation, involves (a) translation of the document into the target language, (b) retranslation back into the source language, (c) comparison of the two, and (d) working with the translators to adjust the target language. When no assessment is made directly of the target language questions, poorly worded tracts that back-translate can successfully go undetected (Blais & Gidengil, 1993). They recommend a process including translation (usually by a person working from the source language to their primary language), review (by a person with translation skills as well as research skills), and approval (by a person who understands the research subject, research skills and usually some proficiency in the languages involved) (Harkness, Pennell & Schoua-Glusberg , 2004; Smith, 2004). (Guidelines for survey translations for national and cross-national research are underway. See International Testing Commission www.intestcom.org/itc_projects.htm)

An aim in this study was to construct a functionally equivalent Swahili questionnaire. The survey instrument was translated from the source document in English, to the target language Swahili by the pathologist member of the research team who is bilingual native speaker of Swahili with input from other team members. Most variables and their codes were succinct and concrete so translations were agreed upon by team members after discussion.

Interviews were conducted in Swahili. Before interviewing, the PI who speaks Swahili fluently but is not a native speaker, practiced further with non-informants and a

US Peace Corps host country national Swahili language/cross-culture language instructor.

Responses to the open-ended question were translated (from Swahili to English) by the PI. Since inexperienced translators work more on the level of words than on the level of meaning, increasing the likelihood of too close translation (Harkness et al., 2004), the translations were reviewed by the team member trained in qualitative research and the language instructor

Field testing

Pretesting is important for quantitative (AAPOR, 1999; Presser et al, 2004) and qualitative research studies (Janesick, 2004) to ensure that questions are understood by the respondents, can be properly administered by interviewers, and do not adversely affect survey cooperation. Field testing of the survey instrument took place at MNH Mortuary in December 2004. The mortuary manager administered the questionnaire twelve times on a trial basis. The Mortuary Manager was debriefed about her perceptions of problems, prevalence of problems, reasons for the problem, and proposed solutions. During this time the PI was observing and integrating into the Mortuary milieu.

During field-testing, most respondents did not appear comfortable filling a self-administered survey questionnaire; some were illiterate and embarrassed to admit they could not, others spent inordinate amounts of time, and answers were often incomplete. A high non-response rate was expected if this mode of survey administration was used in the actual study. Electricity at the Mortuary was intermittent, so using computers during data collection was not an option. To maximize the response rate, it was decided to conduct investigator administered paper and pencil surveys in person whenever possible.

Members of families that experienced a violent death visited the Mortuary at least twice. The first visit was for preliminary identification of the body. The second visit was pre-arranged for several days later during which time family members formally identified the deceased in attendance with police and pathologists. Pre-testing revealed that these mortuary visits afforded a window of time during which data could be collected. Although people often appeared stoic during the first visit, it was often a time of shock and acute grief, and they were unable to focus on the survey instrument. The best time to administer the questionnaire was during the second visit, which usually included a wait of several hours while close kin waited for the final inquest, coordinated funeral arrangements, and paid mortuary fees as other relatives and friends gathered to escort the body to the burial site.

During field-testing and in the first weeks of data collection, it also became apparent through observation that many homicide deaths were distinctive in that they were usually brought in by police, covered by few clothes, sandy as if rolled in the dirt, with multiple wounds from multiple types of weapons. The 'Cause of death' (referred to as "Injury Intent" in the *Surveillance Guidelines*) entered into the Ledger by the mortuary manager or attendants for these deaths was variously: "*kipigo*" (beating), "*moto*" (fire) "mob justice" "mob killing" which after further study and discussion with members of the research team and mortuary attendants, could all be clearly categorized as victims of mob violence. Mob violence was not a code in the *Surveillance Guidelines* (Holder et al., 2001) and had only been hinted at in the peer reviewed literature in Tanzania (Neki, Joinet, Ndosi, Kilonzo, Hauli & Duvinage, 1986). However mob violence has been reported by newspaper and television journalists in Tanzania; it is widely discussed by

the populous, as '*sheria ya mkononi*" translated as "mob justice or literally as "law in the hand". More than half of the deaths included during pre-testing were due to mob violence. Therefore the variable of Intent was revised to include this new code. The new code of death due to mob violence was operationalized as one caused by multiple wounds from multiple weapons wielded by multiple people over a short period of time. The code was used during the entire study.

The variable 'Weapon(s) used' was amended so that each weapon type was coded dichotomously, in an effort to learn how many different objects were used during one incident of homicide.

Field testing demonstrated that the questions were easily understood and appropriate in the Tanzanian context, and that people were willing to answer them. To further increase reliability it was decided that (a)interviews would be conducted by three nurses with previous interviewing and research experience, and (b) 'Cause of death/weapons' would be determined independently by a pathologist.

Data Collection

Data were collected every day at the Mortuary. Daily presence at the Mortuary enabled learning interactions with the mortuary attendants and pathologists as well as the family and neighbors of those who had died a violent death and resulted in constant validity checks. When the PI was not interviewing people, she was participating as a nurse, working in the front office of the Mortuary where she interacted with the public coming to identify or claim bodies, the police who were waiting to formally identify the body and the mortuary attendants. As a professional colleague she participated in registering bodies and releasing them to the relatives, had full access to the autopsy room,

and helped count and ready the unidentified bodies for city burial. The final signature of the Burial Permit was always the Manager's duty. The purpose of the participant observation were to (a) validate the quantitative data when possible, (b) gain understanding of homicide in DSM by learning visually what victims looked like and (c) learn enough about the daily routine of the Mortuary so as to understand how to set up a surveillance system. Descriptive, methodological, and analytic notes of the mortuary based observations were recorded almost daily in a field notes journal (Bernard, 2000).

Event-specific data were gathered by interviews conducted by (a) the PI, (b) the diploma-trained Mortuary Manager, and (c) a Master's trained member of the MUCHS faculty, School of Nursing. Formal training was not conducted for the interviewers.[1] Since all the interviewers had participated in developing the survey and had previous interviewing research experience, all the interviewers reviewed the surveillance questionnaire and role played the interview. The two Tanzanian interviewers gave the PI information about how to enter the field as a participant observer.

The PI was at the Mortuary every day during the peak morning hours and when informants were expected; the Manager usually interviewed otherwise. In the beginning, the Manager introduced the PI to the family of the deceased. As the PI investigator became integrated into the mortuary setting, the introduction became unnecessary. Answering the survey questions became part of the routine for every family who experienced a violent death in DSM in 2005.

[1] It had been expected that WHO would send one of their staff who was introducing the Injury Surveillance system to Mozambique, (see Bartolomeos & Peden, 2003). However the appropriate WHO funding would have arrived too late to allow training before the surveillance start date of January 1

Preferred respondents were adults drawn from the group who came to accompany the body of the deceased for burial. As the group waited for the body, the investigator approached the group and asked if they would answer 12 questions. The group leader, who was always male, designated several individuals which often included him. The sub-group of three to four members was asked if they would prefer to be interviewed in the privacy of a room with a closed door, or on a veranda at the front of the mortuary that was often visible to hundreds of other people but out of their auditory range. The veranda was always chosen. The interviewer would then interview the sub-group. Interviews usually lasted about 15 minutes. Since it has been found that less standardized interviewer behavior can lead to more standardized comprehension (Conrad & Schober, 2000), gentle probing with additional questions was used when necessary to clarify responses especially as to age, place of residence, and reason for the death.

When it was not possible to interview friends or relatives, data were gathered from the police or transcribed from the Registration Ledger (which was based on police data if there were no relatives). Visual autopsies were used to gather information about age, weapons used, and cause of death. Age was estimated by the police or the Mortuary Manager. Since the body was identified later and Ledger entries corrected in some cases, it was possible to compare estimated ages with actual ages. Of 20 consecutive corrected entries, the estimated range of ages was 20-49 while the actual age range was 15-46. No estimated age was exactly correct but both the actual and estimated mean and median ages were the same (30.7 and 27.5 years respectively). Therefore the age estimates were demonstrated to be accurate overall, and were subsequently used, when actual ages were not available.

Data collection of qualitative data is usually driven by the principle of saturation. However since the open-ended question, was part of the survey questionnaire, a note was written for every case possible. Saturation, when patterns of assault and mob violence became clearly discernable, occurred in October yet Summary notes continued to be recorded until the end of the year.

Data Analysis

Following the *Surveillance Guidelines* (Holder et al, 2001), EpiInfo version 3.3.2 was used for data entry and analysis of the quantitative data. The computer program was downloaded for free from CDC, making it possible for all members of the research team in both Tanzania and the United States to share datasets transparently, and to upgrade versions independently. The raw data were entered in Tanzania throughout 2005.

Year of birth was transformed into 5-year age groups per CDC/WHO practice. Data were organized so that future data can be added logically and continuously. For example the oldest age group was coded as "1", and the youngest was "12", so that data of incoming cohorts can lock into the existing database (as "13" or above) thereby bypassing the disruption of recoding the age groups anew . Frequency distributions, means, standard deviations, proportions, rates, odds ratios, t-tests, and probability tests (Chi^2 and Exact) were calculated as appropriate for each variable.

For both quantitative and qualitative analysis, cases were divided into broad categories: Adult Males, Adult Females, and Children. Each broad group was divided into two. Adult Males were divided into mob deaths and assault. Adult females were divided into intimate partner violence and non-intimate partner violence. Children were

divided into neonaticide and non-neonaticide. The cases being discussed in the present paper are those due to mob violence.

Qualitative and quantitative data were linked physically and through cross-referencing and preserved specific to each case (Sandelowski, 2000). Each homicide victim was given a number which was written on the survey questionnaire. Each survey questionnaire was filed with other same case data including observations and memos pertaining to it. The case number was linked to the Mortuary's Registration Ledgers which were linked to the post-mortum reports.

Preliminary qualitative analysis began with text translation, especially when Swahili words had multiple meanings, or were used in unexpected or very consistent ways. The translated test was transcribed into a word-processing file. Inductive analysis continued as the transcription was checked for accuracy by the members of the research team with qualitative expertise. Exploration of the qualitative data continued by reading through all the data many times. Memos ranging in size from margin notes to page-long essays were written.

"Coding is done to 'fracture' the data and rearrange it into categories that facilitate comparison of data within and between categories" (Maxwell, 1996, p.78). Coding is tailored to the understanding of the particular data being analyzed. Codes were not developed a priori. Coded pieces remained linked to the victim case numbers. After exploring the data and writing memos, following respondents' words and self-identified emphases, codes and themes emerged (Creswell & Plano Clark, 2007). A storyline emerged (Sandelowski, 1995). The next step was comparing and contrasting the two data

sets by organizing and evaluating first, each quantitative variable to the qualitative data, and then, the additional qualitative codes and themes. The data sets were then merged.

Results

Research Process

By monitoring all city mortuaries and police posts, it was learned that almost all violent deaths were sent to MNH. All data collection except for 2 homicides (from one district hospital) occurred at MNH. On-site data collection and the mixed team approach were important in providing validity of the findings and uncovering differences in normative perceptions,

Multiple sources of data informed most cases (Table 3.2). Quantitative data were gathered on all cases of mob violence (n=206). Qualitative data were gathered in 60% (n=129) of cases. Qualitative data were able to support the quantitative data. But much of the qualitative data was not addressed by the quantitative data.

Adult male relatives (fathers, brothers, and uncles) were the most important informants in about half the cases. A grandfather and an employer were each an important informants for one case. For five cases, a female relative was an important informant (a mother, a sister, a wife, and two aunts). Friends and neighbors "ndugu jirani" (relative neighbors i.e. living together interdependently) were especially important as informants for 10 cases. Police were the only source of data for 88 (42.7%) mob deaths.

Most of the participant observation was done in MNH mortuary, where the state (police), community (health workers), and family members of the individuals who died a violent death intersected. The PI gained understanding through the police about the

circumstances leading up to death and the mortuary attendants taught her how to recognize various types of wounds. Participant observations revealed mob violence was different than assault, more clearly than could have been learned from a quantitative data set.

Having three interviewers was important so that as many families of homicide victims as possible could be interviewed. Recorded answers to the open-ended question were typically less than 50 words. Standardization of recording of the qualitative data was imperfect in that, investigators differed in what they recorded: the Mortuary Manager emphasized familial perceptions of the deceased; the nurse faculty member stressed familial process after death; the PI emphasized the individual prior to death. The Principle Investigator was obviously a foreigner by skin color and accent which would have led to reactivity by the respondents. Some of the impact could have been positive in that respondents tried to carefully communicate their answers. Some of the impact may have been negative in that the variable for 'Occupation' was inconsistently coded. In addition, cultural meanings assumed by the informants may have been missed by the PI. For example, the Mortuary Manager recorded more people saying, "We were tired and now we will rest" in response to the deceased's death than did the PI. In addition the Tanzanian interviewers were more precise in describing the respondents. When the PI recorded "relatives", the Tanzanian PIs were more likely to record the specific relationship (many of which are not directly translatable into English). Different expectations of who caused a homicide death allowed the PI to recognize mob violence as fundamentally different than assault (see Outwater, Campbell, Mgaya, Kinabo,

Abrahams, Kub, et al., 2008). The data base was broadened by having a cross cultural team which was useful in an exploratory study.

Quantitative Data Results

This field implementation of the Surveillance system resulted in an accurate description of violent injury deaths in DSM in 2005, as recommended by the WRVH (Krug et al., 2002). The full descriptions of these findings are reported in Outwater, Campbell, Mgaya et al. (2008). As previously mentioned, the results described here will be specific to the mob violence deaths.

The new code of mob violence captured the largest category (57%) of the 362 homicides, (n=206), for a crude rate of 7.2 per 100,000 population. Administratively, DSM is divided into 3 districts and 73 wards (with populations between 4,500- and 90,000). Homicide from mob violence was distributed evenly through the three districts. However the mortality rate from mob violence ranged from 0 in thirty wards, to 34.3 per 100,000 population (69.2 per 100,000 amongst males) in one ward. Two wards accounted for 19.4% of deaths due to mob violence. Seventy three percent of mob deaths occurred in the ward in which the deceased had lived.

City streets and other large public spaces were the site of 154 (75.1%) mob deaths. Thirty mob deaths (14.6%) occurred in residences other than the victims'. The remainder (10.3%) of places were homicide occurred were at farms/countryside (12), business (7), and unknown (2).

Victims of mob violence were 99.5% male. Their mean age was 27.5 (Std. Deviation 5.98). The median age was 26. The age range of mob deaths was 15 to 50 years

although half occurred to men between the ages 24-31. No non-Tanzanians were killed by mob violence.

All victims of mob violence died after being injured with multiple weapons. The principle causes of death for 37 (18.1%) victims were determined to be due to bodily force including fists and feet, blunt objects caused 65 (31.7%), sharp weapons 49 (23.9%), fire caused 41 (20.%), gunshot 5 (2.4%); for 8 (3.9%) the leading cause of death was undetermined.

The reason behind mob action was theft or alleged theft in 179 (86.9%) cases; the reasons behind the 14 (6.8%) remaining deaths were probable misidentification in 9 cases (4.4%), quarrels in 2 cases (1%), and sexual assault and alleged witchcraft in 1 each (0.45% each).

The occupation recorded for 152 (74.1%) victims of mob violence were unemployed (32), thief (62) or Unknown (58). Another 32 (15.6%) were classified as self-employed without an employee including street vendors/petty businessmen (25) and skilled laborers (7). The remaining victims (10.3%) were farmers (4), a student (1) and .employees: house servant (1), drivers (2), and day laborers (13).

Qualitative Data Results

Of 206 cases of mob violence, qualitative data were available on 129. Participant observations revealed that often, victims of mob violence wore only a few shabby clothes, sometimes only a string held up ill-fitting shorts. Most appeared very thin, as if they had been malnourished and ill before they died. Visual autopsy and the occasional formal autopsy revealed their bodies had no visible body fat.

History of the deceased, and causes leading to his death

Eighteen codes and four themes emerged upon data analysis (see Table 3.3). When asked, "Is there anything else you would like us to know?" a few families took the opportunity to firmly state that the victim was not a thief. Sometimes they were supported by the police. At least 8 people may have died through mistaken identity, as illustrated by the quote below. A 39 year old male was killed by being hit and kicked (Case 85-2005):

> *Mdogo wake: Alikuwa anafanya kazi ya kulima shamba kwa mtu – tajiri alikaa mjini. Siku ya tukio alikwenda kunywa pombe. Akapita njia ambayo siku za nyuma waliwahi kuibiwa. Watu waliponmwona wakasema Ndiye mwizi wetu. Kumbe hakuwa mwizi. Walianza kumpiga hadi kufa.*
> *Polisi: Hakuwa mwizi. Waliompiga wameshashikwa. Wako ndani.*

> Younger brother: He was working by cultivating the farm of a person - the employer stayed in town. The day of the event he went to drink *pombe* [local brew]. He passed a way upon which days before, they had already been robbed. When the people saw him, they said, Indeed it is our thief. Behold! he wasn't a thief. They began to beat him until he died.
>
> Police: He was not a thief. Those who beat him were taken. They are inside [jail].

When respondents chose to relate the history of their relative who died of mob violence they sometimes explained that the deceased had been a good person but changed. Many of the victims had been petty businessmen. Drugs and alcohol were not usually mentioned in regards to the victim, but sometimes had an important place in the story. Many reported the victim's long history of stealing and warnings. An uncle described his nephew (Case 240), a 31 year old who was beaten and burned:

He was a fisherman but had no work. He appeared to be ill, without a lot of strength. The deceased was a good person growing up – he even had a wife and 2 children. Three years ago she left because he started using heroin (unga). When she left he was sleeping anywhere. Sometimes he would spend the night outside their house and leave in the morning. They brought him to work carrying sand, but he complained he couldn't do it. Three times he was beaten by citizens, even he was admitted to MNH and healed. Once to cure him of heroin and once to recover from broken knees and burns. His little finger had been chopped off…He was taken to the police many times, they were used to him, but they'd just let him go."

The event

Often people briefly explained what occurred on the day of the event. They reported that the victim had usually been part of a small group which stole something. Quantitizing (Sandelowski, 2000) items that the deceased was reported to have been stealing at the time of their deaths led to: cell phones (19), purses/bags (10), chickens (7), televisions (5), doors (2), automobiles (2), pigs (2), scrap iron (2), cows (1), wooden fencing material (1), and money from a child (1). When the person from whom they were stealing cried out for help citizens would come to the rescue. The word for "people" (Swahili: *watu*) was not used to describe those who participated in the killing of a thief. Youthful friends of the deceased, themselves at risk, sometimes used the term "good citizen" (Swahili: *raia mwema*) to describe those who participated in a mob killing. Usually the word for "citizen/fellow citizen/countryman" (Swahili: *mwananchi*) was used, denoting their participation in upholding national standards. In the following

instance, a 26 year old male (Case 205-2005) was stealing from the house of a **person** (*mtu*), and **citizens** (*wananchi*) responded to the person's cries for help.

> *Ndugu: Marehemu alikata dirisha la nyumba ya mtu. Alianza kuiba. Mara mwenye nyumba alipiga kelele ya mwizi mwizi. Wananchi walijitokeza walianza kumpiga hadi kufa.*
>
> Relative: The deceased cut the window of the house of a person. He began to steal. Suddenly the house owner yelled, "Thief thief." Citizens appeared themselves. They began to beat him until death.

Reactions of the family

Many relatives, especially fathers, expressed that they had been fatigued by the acts of the deceased. Many said, especially to the Mortuary Manager, "Now we will rest." Often the deceased would be missed and the losses were painful. Some of the victims left behind large responsibilities of children and wives and the consequences of his death could be severe to a family. For example an uncle speaking of a 35 year old farmer (Case 191-2005) said,

> *"Rais alilaana hii si nzuri. Kwa nini hawawezi kupelekwa sheria. Alikuwa hapa wiki mbili kutoka Tarime. Alikuwa mgeni. Hatujui kama alikuwa mwizi. Walipiga kelele, Mwizi, mwizi. Hakuwezi kujidhibiti. Hakuna mtu kusema alifanya nini. Alikuja kumwona dada yake, ambaye alipoteza mume wake. Walitaka yeye kurudi nyumbani Mara. Alikuwa na watoto wengi na wanawake wawili. Kwa kweli inaumia sana. Hakujui kitu kuhusu maisha ya DSM.*
>
> "The President has condemned this. Why not take them to the law? He was here only 2 weeks from Tarime. He was a stranger/guest. We don't know if he was a thief. They shouted "Thief thief", he couldn't defend himself. Nobody claimed that he did anything. He came to see his sister, who had lost her husband,

requesting her to return to Mara. He has many children and 2 wives. Really it's painful. He knew nothing about how it is here in DSM."

Some were important because they had fewer responsibilities. One father explained that Case 201-2005, a 31 year old male, "...was my only child. I have only two other relatives – one of whom is blind."

Comparing and contrasting the two data sets

The quantitative data were evaluated as the primary data, and the qualitative data were compared to them. Quantitative data gave an accurate valuable overview of homicide death in the statistical description of homicide deaths. In addition it located sites of injury and residence to the ward level. Qualitative data gave indication that some youth were killed at residences not their own; the quantitative data clarifies this with numbers of 14.6% killed at residences and 75.1% killed in the streets. The quantitative data explained that 99.5% of those being killed were individual males with a mean age of 27.5 and 99.5%; the qualitative data confirmed the facts and added that most of the victims were individuals within families and communities. In terms of the weapons used, the data in both the quantitative and qualitative data sets converged. Observations also, using visual autopsy of the corpse verified which weapons had been used. Blunt objects were rarely mentioned by the respondents and may have been part of the definition (along with the other quantitative code, bodily force) of being beaten. The data sets absolutely concur that mob violence is focused on thieves, and that misidentification does occur, though infrequently. Visual autopsy gave the clearest data about the ill health of the victim, although it was sometimes reported by respondents.

The quantitative variable 'Occupation' was not well described in the qualitative data, and was difficult to operationalize in the quantitative data. Considering that this is an important variable more qualitative research would be instrumental to help clarify the meaning of the variable, and devise appropriate codes.

The qualitative data added context and information on variables not addressed in the quantitative part of the survey questionnaire. Data on drugs and alcohol and the long history of stealing of many of the deceased are introduced. That many had been ill was corroborated by observations and the qualitative interviews. The qualitative data helped describe briefly the "tiredness" of the family that resulted from the youths "habits". Descriptions of what happened on the day of the event emerged out of the qualitative data including a list of the items stolen and the idea of good citizenship in response to a cry for help from the victim of a thief. Reactions to the event were on the family level and included a sense of 'now being able to rest', as well as pain brought on by the result of the loss of a member of the family, both economic and spiritual.

Interpretation

Mixed methods research techniques, enabled quantitative and qualitative data sets to reveal a story that was more comprehensive than either could have provided separately. In DSM 2005, hundreds, perhaps thousands, of young unemployed male youth were stealing for daily sustenance. They were punished and killed by citizens coming to the rescue of victims of theft, robbery and burglary. Neither data set reveals the causes of the unemployment or the role of the state in policing and keeping the community safe.

Results in terms of Cost and sustainability

The cost of a survey is substantial and includes training of interviewers, investigator time and transport, transcribing the data to a computer, checking the computer files for inconsistent or impossible answers, translating, data analysis, writing reports, and printing and reproduction at all stages. The principal cost difference between active and passive surveillance is investigator time and transport. It should be noted that the cost of an ongoing active surveillance system depends how tasks are divided. A Principle Investigator does not have to be present at all times. The person needed to undertake the daily activities could perhaps be a nurse or public health practitioner.

Respondents were usually at the mortuary during the busiest time of day, so the Mortuary Manager and attendants could not make the surveillance a priority. Therefore active surveillance ceased at the end of 2005 when the PhD investigator withdrew. However all corpses entering the Mortuary continue to be registered in the Ledgers.

Discussion

By following the *Injury Surveillance Guidelines* (Holder et al., 2001) it was possible to discover knowledge in a way that was flexible, acceptable to both investigators and respondents, and relatively simple.

Mixed methods allowed a play between qualitative and quantitative data that informed and extended knowledge. Most importantly the qualitative data added depth to our perception of the deceased – he escapes from becoming a mere statistic when placed within the context of his family.

New code

For the new code of mob violence within the variable of 'Injury Intent' the data sets converged. It was identified during field testing and examined in the interviews. It was discovered that the victims of mob killing are Tanzanian adult males without regular employment killed publicly by Tanzanian citizens using weapons at hand. A tentative definition of mob killing is a death by which a medium to large group (dozens to hundreds of people), using multiple weapons, in concert kills an individual or a small group. It was not possible from these data to reliably distinguish between spontaneous and vigilante actions. The mode of death and the perpetrators are distinctly different from other types of violence (see Outwater, Campbell, Mgaya, et al., 2008).

Ng'walali and Kitinya (2006) retrospectively gathered data on mob violence from the MNH mortuary ledgers for the years 2000 - 2004. It was not known if the sample was complete or representative of all DSM. The validity checks done in 2005, confirm that their sample may be representative of DSM mob killings in 2000 - 2004. For 2000 - 2004 it was reported that in DSM, 1249 people were killed by mob violence (Mean/year: 252, range: 198-301) (see Table 3.4). The 206 mob deaths recorded in 2005 fall within that range.

For 2000 - 2004 it was found that fire accounted for 48.11% of mob deaths (Ng'wali and Kitinya, 2006).This is double what was discovered in 2005 during which time 28.2% of the victims had experienced any burning, and 20.4% were believed to have died as a result of fire. This difference cannot be definitively explained except that injury profiles are subject to sudden change (Holder et al., 2001). For example, in Cape Town, South Africa, the phenomenon of "necklacing" (in which victims are beaten and then

necklaced with a kerosene soaked tire, and set alight) which is a form of mob violence, was first encountered in 1984 (Lerer et al.,1994), peaked in the late 1980's, and since 1995 victims of that particular way of death have not been seen (personal communication Prof. Lorna J. Martin, U. of Cape Town, personal communication, June 2007).

The new code of 'Mob Violence' is important in determining directions of future research and interventions. Prevention strategies must be different for different types of violence. Mob violence occurs at the community level, which suggest that strategies to address it need to be aimed at the community level. Citizens are obviously willing to be involved in addressing community level problems. Solutions to decrease mob violence may include community level government, criminal justice and employment issues. In Rwanda, the gacaca courts, a pre-colonial system of community justice disbanded by the colonialists, have been reinstituted and are working in many villages, addressing the deeds of individual perpetrators of the genocide without use of the death penalty. While the International Court has processed only a handful of high-level perpetrators at great cost, the gacaca courts have processed thousands of perpetrators at the community level (Rucyahana, 2007). In Tanzania, SunguSungu, a community policing sanctioned by the government is a fairly well described phenomenon (Bukurura, 1995; Fleisher, 2000; Heald, 2006; Paciotti, 2004). In the 1990's SunguSungu was incorporated at the behest of the Minister of the Interior in other places, in response to the government's inability to control increasing levels of petty theft and stock stealing. It became a nation-wide phenomenon in the mid-1990's (Paciotti & Mulder, 2004). Elements of its community based nature with links to the police could be adapted to the urban setting. DSM community level government is viable and research needs to be done to discover

culturally appropriate ways to address the problem of petty thieves that can lead to a more constructive outcome than death. Finally, it will be important to discover if these findings are relevant to other resource poor countries.

Costs and sustainability

Implementing ongoing data collection for interpersonal violence is costly and logistically challenging (Butchart et al., 2004). While feasibility, full capture of homicide deaths, potential accuracy, flexibility, acceptability, and utility has been established by this study, sustainability has not. In Mozambique and Ethiopia where WHO were actively supporting injury surveillance activities in 15 hospitals and health centers, it was also found that the instituted surveillance systems were unsustainable. It was concluded that the data collection mechanism needs to be "incorporated into the daily tasks" of the institution (Bartolomeos & Peden, 2003).

To meet the challenges often encountered by passive surveillance systems including under-reporting and incomplete data, the instrument must be simple and brief (Gordis, 2000). Including the surveillance system as part of daily activities in DSM may be possible by incorporating the variable into the mortuary's Registration Ledger books. The challenge is that data entry be reliable enough so that if chances to analyze it arise, following Ng'wali and Kitinya's (2006) example, the results be accurate. Coding practice should be standardized, where appropriate in concordance with the Injury Surveillance Guidelines (Holder et al.,2001).

Limitations

Threats to External Validity

Quantitative

It cannot be discounted that the sample of deaths from violent injury may be incomplete. For example, if a victim of violence was admitted to a district hospital and then died, it is conceivable that the body was released to the family without being registered at MNH. Also, it is possible that undiscovered neonaticides occurred (especially those thrown into pit latrines). In addition, Lugalo Army Base refused to confirm deaths of interpersonal violence. The bi-weekly checking of all hospitals and police posts in DSM, and the finding that 3 victims of interpersonal violence (one officer, one soldier, and one civilian) from Lugalo were received at MNH during the year minimize this possibility.

Qualitative

With the qualitative data collected on 129 of 205 male victims of mob violence, gathering many short responses to the open-ended question has led to a coherent story. However because of the brevity of the responses little interpretation was able to be done and this could impact on the validity of the analysis. Saturation was achieved after ten months of participant observation; in other words after interviewing about 100 families of victims of mob violence. For females however, data of 16 of 17 femicides was not enough, qualitatively (or quantitatively), to find a coherent storyline (see Outwater, Campbell, Mgaya, et al., 2008).

Threats to Content Validity

Quantitative

Similar survey instruments had been piloted in two African countries (South Africa and Uganda) and were considered reliable. Adjustments needed to be made for the Tanzanian setting,

The variable of 'Activity at time of injury' proved unreliable because (a) the coding was more appropriate for injury morbidity than mortality and (b) the person who knew the activity in certainty was dead. This variable was abandoned. (More useful data would have been garnered by asking time of death.)

The variables concerning 'Residence' and 'Place of Injury' were reliable on the levels of District and Ward, but not reliable on the level of the Street. This is because people did not describe places by street names in DSM. Rather they used locally familiar descriptions such as "*mbuyuni*" (under the *Ficus* tree), or "*mbele ya posta mpya*" (in front of the new post office). This led to a different "street" for each victim and the data could not be consolidated. Street names and numbers are often an issue and alternative ways of describing locations should be used depending on the context.

During database cleaning it became evident that the investigators had inconsistently coded the variable 'Occupation'. When next of kin were asked about employment of the deceased, they often replied that his employment was unknown, that he was a thief. Since there was no code for "thief", homicide victims in that situation were coded as "Other" "Unknown" or "Unemployed". However the qualitative data informed the quantitative data, making it possible to clarify errors in coding, and impute missing data. During re-coding, "Unemployed" categorized those who were formally

declared without a job; "Unknown" categorized the unclaimed bodies buried by the city; and "Other" included those who neither unemployed nor buried by the City, but were identified as thieves. This employment categorization is an issue globally, as many young men, the age and gender category in which homicide most often occurs, are unemployed in the conventional sense, but are thieves, or otherwise employed in the "underground" or "illegal" economy; in fact that type of occupation is a risk factor for their demise. More attention needs to be paid to further development of a meaningful categorization for this variable in violent death research and surveillance generally so that cross national research on this issued can be conducted (Campbell, personal communication, 2007)

Qualitative

The PI was an interviewer although she is not a native Swahili speaker. In addition the answers to the open-ended question were not tape-recorded. Therefore mistakes based on language could have occurred undetected. This potential problem and other potential sources of bias were ameliorated by (a) having two native Swahili interviewers and (b) using the mixed team approach in which cross-cultural discussions could take place easily and frequently..

Almost all the respondents were men. It is not clear if or how females would have reported differently. Reactivity on the side of the respondents due to the foreign-ness of the middle-aged female white PI could have had at least two effects: (a) it may have led to decreased open-ness about sensitive topics and (b) it may have increased engagement due to curiosity. Reactivity was reduced as the PI became integrated into the setting.

The multi-disciplinary, multi-cultural and multi-lingual research team was important in assuring qualitative rigor. Qualitative rigor lies in the credibility, confirmability, and authenticity of analysis (Tobin & Begley, 2005). The team assured that interpretation was reasonable and helped overcome biases. It provided peer review to confirm the analysis process and provide authenticity. Although the qualitative data set was not comprehensive, and would be difficult to incorporate into a passive surveillance system, it was extremely useful in this formative context and explicates some next research steps.

The generalizability of the methods used in this study are wide. It is believed that the methods can be adapted to all mortuaries in TZ and inform surveillance in other low-income countries.

Recommendations

Future research

- Expand the study of interpersonal violence in TZ including
  - Extend the qualitative portion of this research with in-depth interviews of both families and perpetrators of mob violence.
  - Compare victims and their families with people with similar demographics who did not experience homicide
  - *Improve operationalization of the quantitative variable of 'Occupation' with qualitative research.*
  - Test mob victims for alcohol, drugs, HIV, nutritional status, and endemic parasites such as malaria, worms, and schistosomiasis would reveal the health status of the victims, potentially important in terms of interventions.

For example if job creation programs were to be created, it would be important to know if people were strong enough to work.

- Develop a national research agenda on interpersonal violence
- Establish dissemination mechanisms for research findings.
- Integrate violence prevention research into undergraduate and postgraduate research training settings.
- Establish prevention strategies and demonstration interventions.
- Investigate mob violence in other settings.

Develop a surveillance system in Tanzania and other low income settings

- Using this active survey as a foundation, build an ongoing surveillance system. If no or few funds are available for active surveillance, variables can be instituted as a passive surveillance system.
- Incorporate standardized coded variables into the MNH mortuary Registration Ledger books so that it is incorporated into the staff's daily routines.
- Expand a passive surveillance system to other regions, by augmenting the practical training of mortuary attendants who come to MNH for skills upgrades, with formalized instruction on how to run a passive surveillance system through the registration process.
- Further develop in-country capacity by including the work of the surveillance system in undergraduate and postgraduate research courses in the MUCHS Schools of Public Health, Medicine, Nursing, and University of Dar es Salaam, Department of Demography.

Conclusion

The *Injury Surveillance Guidelines* were clear. They were adaptable in that a new code was conceptualized and added to the variable of intent. Mixed methods facilitated a rich basic description of the mob aspect of homicide as it occurred in DSM in 2005. The new code is important in defining future research that will lead to interventions.

Table 3.1

DSM, TZ 2005, Survey Variables and Codes

Minimum Data Set

Variable: Identifier

Definition: Hospital number + date +postmortem number

Code type: Numeric

Variable: Age

Definition: The deceased's year of birth

Code: Numeric

Comments: During analysis, individuals were assigned to age groups:

1	<1 year
2	1-4
3	5-14
4	15-19
5	20-24
6	25-29
7	30-34
8	35-39
9	40-44
10	45-49
11	50-54
12	55-59
13	>60

Variable: Sex

Code type: Numeric

Code choices: 1 Male,

2 Female

3 Unrecorded

Variable: Injury Intent

Definition: The role of human intent in the occurrence of the injury event

Code type: Numeric

Code choices: 1 Unintentional (accidental)

2 Suicide

3 Assault

4 Awaiting results of investigation

5 Legal interventions (police)

6 War

7 Mob violence

98 Other

99 Unknown

Comment: Data for Codes 1, 2, 4, 5, and 6 were collected but were not included in this analysis. Code 2, Suicide has been analyzed: Mgaya, Kazaura, Outwater, & Kinabo (accepted). Suicide in Dar es Salaam Region, Tanzania 2005.

Variable: Occupation

Definition: "Currently employed" as used in the Integrated Labour Force Survey, 2000/01: "at least **one hour**....or be temporarily absent from such activity" in the week before the survey

Code type: Numeric

Code choices:

1	Farmer
2	Small landholder
3	Large landholder
4	Government worker
5	Employed
6	Larger business owner, > 1 employee, and infrastructure
7	Small business owner, ≤ 1 employee, + infrastructure (e.g.kiosk)
8	Petty business, on the street without stable infrastructure
9	Professional
10	Student
11	Housewife
12	Guard
13	Day laborer
14	Skilled laborer
15	Driver
16	Politics or official party worker
17	Retired
18	Unemployed
19	Child <15 years
98	Insufficient data
99	Unknowns, buried by the city

Variable: Place of Occurrence

Definition: Type of place where the injury that led to death occurred

Code type: Numeric plus character string (98)

Code choices and:

1	Home, including gardens, and outbuildings, such as pit latrines animal enclosures
2	Schools, institutions
3	Street, including passageways between houses and main thoroughfares
4	Residential, other than the deceased's place of residence
5	Sports, athletic area
6	Transport area, including bus stops
7	Industrial and construction sites
8	Farm (not home)
9	Place of business, including kiosks, bars, taxis (if driver), car washing sites
10	Countryside, river, water, ocean, beach
98	Other (explain)
99	Unknown

Variable: Mechanism of injury

Definition: How the injury was inflicted

Code type: Numeric, plus character string (98)

Code choices:

1	Motor vehicle
2	Fall, jump
3	Hit by a person
4	Cutting or stabbing
5	Hit by a blunt object
6	Gunshot
7	Fire
8	Hanging/ Strangulation
9	Drowning
10	Poison, pesticides
11	Poison, pharmaceutics
12	Asphyxia of newborns
98	Other (explain)
99	Unknown

Optional Data Set

Variable: Race/ethnicity

Definition: Indigenous Tanzanians and others, by residence status

Code choices:
1 Indigenous Tanzanian
2 Resident in Tanzania (explain native of which country)
3 Non-resident
98 Other (explain)
99 Unknown

Comment: The *Injury Surveillance Guidelines* (Holder et al., 2001) note that "questions about race or ethnicity are often thought to be inappropriate" and "to consider carefully whether this variable is necessary". NIH grant guidelines requested information on sex and race. This question was not asked, but was noted.

Variable: Date of Injury Death

Definition: Date that death occurred

Code type: Character setting

Comment: Date format YYYY/MM/DD

Variable: Activity

Definition: What was the deceased doing at the time of death

Code type: Numeric, plus character string (98)

Code choices:

1	Work including travel to work
2	School and school sports
3	Sports
4	Leisure/rest
5	Travel, other
98	Other (explain)
99	Unknown

Variable: Residence

Definition: Deceased's normal place of residence by District, Ward, and Street

Code type: Character string

Variable: External cause of injury

Definition: As per ICD-10 Classification

Code type: Character

Comment: This variable was entered during time of data entry.

Variable: Summary

Definition: Open-ended "Is there anything else you would like us to know?"

Code type: Character string

Supplemental data set for Assault

Variable: Circumstances

Definition: Factors that allegedly precipitated the assault

Code type: Numeric, plus character string (98)

Code choices:

1	Quarrel, fight, provocation
2	Act of pickpocketing, robbery, or burglary
3	Accident
4	Self defense
5	Sexual assault
98	Other (explain)
99	Unknown

Variable: Victim/perpetrator relationship

Code type: Numeric, plus character string (98)

Code choices:

1	Spouse (husband or wife)
2	Father
3	Mother
4	Other relative
5	Intimate friend
6	Known person (friend or acquaintance)
7	Stranger
9,	Law enforcement
11	Group of people, mob
98	Other
99	Unknown

Variable: Objects used, Weapon

Definition: The object(s) used to inflict the injury

Code type: Dichotomous numeric, plus character string (98)

Code choices: 1 Clubs, sticks, iron bars

a. Yes b. No

2 Sharps e.g. razor blades, knife, panga

a. Yes b.No

3 Fire

a. Yes b.No

4 Firearm

a. Yes b.No

5 Person, including parts of the body (e.g. fists, feet)

a. Yes b.No

6 Stones, cement bricks

a. Yes b.No

98 Other (explain)

Comment: This variable was used to learn how many different objects were used during one incident of homicide.

Note. Adapted from Holder, Y., Peden, M., Krug, E., Lund, J., Gururaj, G. & Kobusingye, O. (2001). *Injury Surveillance Guidelines.* Geneva: World Health Organization.

Table 3.2

DSM, TZ 2005, Primary Qualitative and Quantitative Data Sources, by Type of Death

Type of Death	Assault		Mob		Neonaticide		Undetermined		All deaths	
Source	Quan	Qual	Quan	Qual	Quan	Qual	Quan	Qual	Quan	Qual
Relatives	87	83	98	93	1	0	3	3	188	179
Friends	5	7	4	4	0	0	1	1	10	12
Police	34	0	102	24	17	0	6	1	161	25
Other	1	9	2	8	0	3	0	0	3	20
Total	127	99	206	129	19	3	10	5	362	236

Table 3.3

DSM, TZ 2005. Code &Theme Book for Homicide by Mob Violence, with Case Numbers

Codes and **Themes**	Case numbers
History of the deceased	
He had good habits but then he changed.	20,23,78,80,221,224,327,240
Occupation (not thief), former employment	20, 24,33,44,49,61,67,90,114,153,191,197,202,203,240, 277,288,327,347,474
He was not a thief	13,24,25,32,44,85,106,343
His habits were not good.	30,67,69,78,213,243
We warned him	30,67,69,81,83,109,133,156,184,192,201,207,213,240, 340,347
"He was an experienced thief" Alikuwa mwizi mzoefu	05,16,18,20,23,28,30,33,38,38,49,53,56,5,59,61,64,65,67 68,69,70,76,78,80,81,83,91,90,92,94,97,100,101,102,103 ,109,110,111,112,113,114,115,127,132,133,135,138,143, 144,149,154,156,167,174,176, 177,178,179,186,188, 189, 197,200,201202,205,207,208,209,213,221,227,237,239, 240,243,254,255,259,270,272,277281,288, 293,294, 295 300,302, 311,327,338,340,344,345,347,429,474, 482, 491
He stole from his parents	23,30,115
Causes	
"It's because of his friends"	35,70,153
Drugs/alcohol, influence of	Drugs 07,18,20,23,30,70,78,100, 240,259,338,474 Alcohol 30,44,272
Lack of employment	153, 277,347

The event

Call from victim Mwizi mwizi	Thief, thief	Whistle 32,97
	44,111,133,150,179,191,197,203,2	

	05
Item stolen	13,49,53,56,57,61,65,67,76,81,91,92,97,100,101,109,110, 114,132,135,143,144,149, 150,156,176,177,179,188,189, 192,197,202, 205,207,208,209, 213,221,240,254, 259, 272,288,293,294,302,338,340,344,345,474,
Person / citizen.	07,20,23,28,33,49,73,97,135,143,167,189,192,203,205,24
Mtu / mwananchi, raia mwema	0,259,281,288,474
He was captured	07,32,33,76,101,111,114,132, 133,150, 156, 179,189,191,277,293,338, 491

Weapons used to kill the deceased	Machetes	Fire	Beaten	Bullet
	59,61,65,67, 69,70,97,100, 106,109,112, 144,149,150, 197,207,294, 302	13,28,59,65, 70,91,101,111, 112,186,192, 196,239,253, 270,311,327, 340,344,491	07,32,33,76, 85,90,100, 132,135,138, 179,200,202,20 3,205,332,340	143

Reactions of the family

"We were tired and now we will rest"	20,38,64,78,80,83,91,92,100,103,112,113,115,127,132,13 5,167,192,201,209,239
Loss	13,23,24,25,150,153,191,200,201,254,277,294,348
This mob killing will not help	33, 153,191,277

Table 3.4

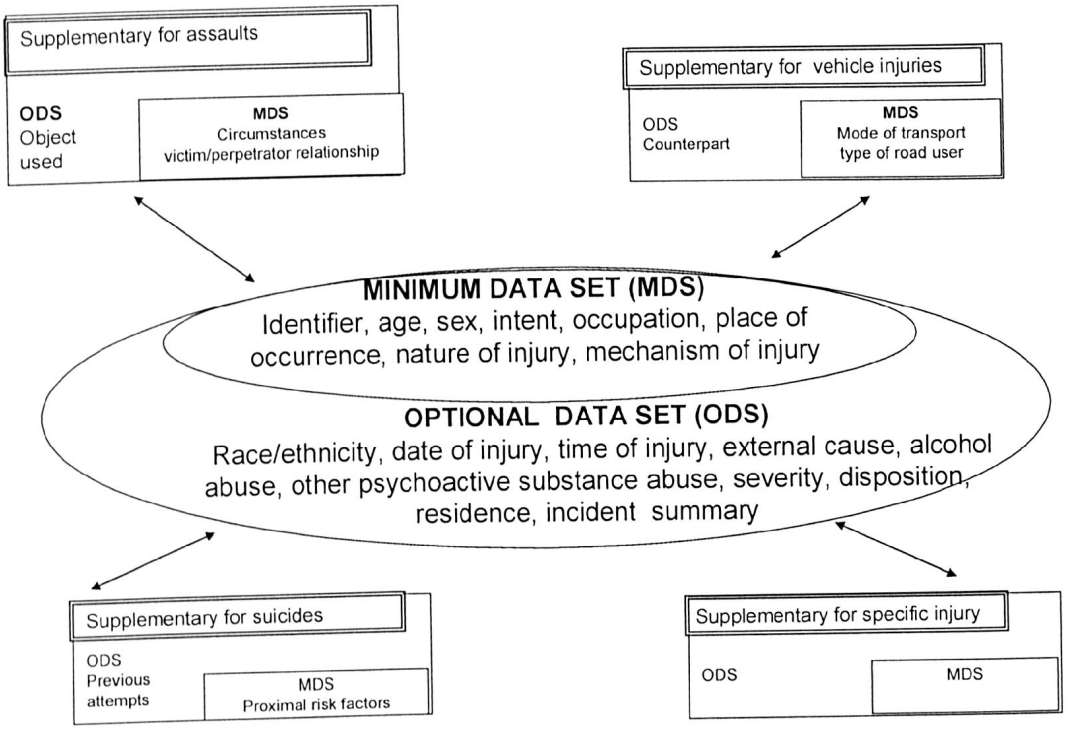
DSM, TZ, Cases of Mob Killing, by Year

Year	Number of deaths
2000	240*
2001	220*
2002	290*
2003	301*
2004	198*
2005	206 (205 males + 1 female)

Note. Adapted from Ng'walali, P.M. & Kitinya, J.N. (2006). Mob justice in Tanzania: a medico-social problem. *African Health Sciences;* 6(1):36-38. (Sex was not included in their report.)

Figure 3.2

Injury Surveillance System, data sets



Note. Adapted from Holder, Y., Peden, M., Krug, E., Lund, J., Gururaj, G. & Kobusingye, O. (2001). *Injury Surveillance Guidelines*. Geneva: World Health Organization.

Homicide deaths in Dar es Salaam, Tanzania 2005

by

Anne H. Outwater, Jacquelyn C. Campbell, Edward Mgaya,

Alison G. Abrams, Lina Kinabo, Method Kazaura and Joan Kub

Abstract

Violence is found all over the world in varying degrees. Tanzania has two important risk factors for violence - natural resources and economic poverty - and yet has remained politically peaceful. It was not known how the low level of violence at the national level would be reflected at the interpersonal level of violent death - homicide.

Objectives

To: (a) ascertain the rate of homicide death and (b) describe the circumstances and those who died of homicide in Dar es Salaam, Tanzania in 2005.

Methods

Following WHO/CDC *Injury Surveillance Guidelines (Holder et al. 2001)*, quantitative and qualitative data were collected on all violent deaths in DSM for year 2005.

Results

The overall age standardized homicide rate of 12.57 per100, 000 population is the lowest city level homicide rate recorded in Africa so far. The age standardized female rate of 2.65 per 100,000 is lower than the world average. Ninety four per cent of homicide deaths were males and their age standardized rate was 22.26 per 100,000. Ninety percent of homicide deaths were experienced by the unemployed, those engaged in informal business, or buried as Unknowns. About 90% of murdered males died in incidents directly related to their attempts to acquire resources, legally or illegally: thieves and alleged thieves (69%), victims of armed robbery (13%), bystanders (4%) and quarrels around payment and sharing (4%). The majority of homicides (57%) were

committed by community level mob violence. Urbanization was a risk factor for homicide.

Discussion

Low firearm violence and low risk for females are important components of a homicide rate in DSM that is low relative to estimates for Africa. High community participation and willingness to uphold common values, has led to most homicides being committed by community mobs policing against petty thieves. Unemployment puts males at high risk of homicide death in DSM.

Conclusion

Research and interventions to address the underlying micro- and macro-economic factors of homicide death, as well as to identify indigenous culturally appropriate ways of community participation that uphold universal human rights are urgent.

CHAPTER 4

Homicide deaths in Dar es Salaam, Tanzania 2005

Tanzania (TZ), the land of Mt. Kilimanjaro and the Serengeti Plains is a country of more than 38 million people. It is rated as one of the world's low-income nations; in 2005 per capita GNI-PPP (Gross National Income-Purchasing Power Parity) was $730 (as compared to a world average of $9420) (World Bank, 2005). Life expectancy at birth was 46 years. Ninety percent of the population was living on less than $2/day (Population Reference Bureau [PRB], 2006).

The most commonly used measure of inequality, the Gini co-efficient (measuring cumulative income share against the distribution of the population), showed that between 1988-2002, the inequality of its inhabitants rose; the Gini-coefficient rose from 0.30 to 0.36 (National Bureau of Standards [NBS], 2002). (Note: The Gini coefficient has a value between 0 and 1, representing the extremes of income distribution. A zero value corresponds to the situation where everyone in the population has exactly the same income, whereas a value of 1 corresponds to extreme concentration of income in one person. A high value indicates a more unequal income distribution [Miyamura, 2007; World Bank, 2007]). Yet, the percentage of people below the food poverty line decreased from 13.6 to 7.5 (NBS, 2002). At least 14 daily newspapers were being published – 8 Swahili language and 6 English. DSM is divided into 3 districts and 73 wards, in each of which live 4,000-95,000 inhabitants. TZ is a fledgling multi-party democracy whose

recent elections have been marred by low levels of lethal violence; 2005 was an important presidential election year in that there was no incumbent.

Tanzania is relatively equalitarian in that there was near gender balance at primary school entry, with a slightly greater percentage of girls attending than boys (ratio 0.98) (Research & Analysis Working Group [R&AWG], 2002). Secondary school enrollment for females was 5.0% and for males 6.0% (PRB, 2006). Female-headed households in DSM have increased from 14.1% in 1991/1992 to 20.9% 2000/2001 (NBS, 2002, p.11). While in 1991/1992 **male**-headed households were slightly more likely to be poor, in 2000/2001 female-headed and male-headed households were equally likely to be poor (NBS, 2002, p. 90).

In 1950, 3.5% of the total population in Tanzania lived in a city. By 2005, about 32% of Tanzanians were living in urban areas (PRB, 2006). Dar es Salaam Region (DSM) includes the port city of the same name and is Tanzania's largest urban area and most prominent region (see Figure 4.1). Since before Independence, DSM has been TZ's most densely populated region. DSMs population density nearly doubled (from 977/km2 to 1793/km2) from 1988 to 2002 (NBS, 2002). In 2005 the population was estimated to be 2.835 million and was said to include members of all 125+ tribes and 21 mainland regions. DSM has an area of 1,393 km^2, although much of that area is not currently urbanized. It is one of 2 regions with more males than females (sex ratio 1.02) (NBS, 2002).

Violence is a worldwide health problem with manifestations of many kinds. It is predicted that violence is increasing dramatically (Murray & Lopez, 1997) and that violence disproportionately affects low and middle income countries (Krug, Dahlberg,

Mercy, Zwi, & Lozano, 2002). Therefore, deeper understanding is urgently needed, especially where there are few basic facts, e.g. low income countries and Africa in particular. A country such as Tanzania, that has two important risk factors for violence (economic poverty and natural resources) merits special study (Butchart & Engstrom, 2002). The region of Dar es Salaam is the most economically and politically important in Tanzania; all regions and tribes in Tanzania are said to have members living there.

The objectives of this study were to: (a) ascertain the rate of homicide death and (b) describe the circumstances and those who died of homicide in DSM in 2005.

Previous Research on Homicide Deaths in Africa

The Global Burden of Disease Report (GBDR) with the most recent WHO health statistics (2002) is believed to be "essentially complete" for 64 countries (Mathers, Ma Fat, Inoue, Rao & Lopez, 2005). For 42 of the 46 countries in the Africa region, "no information on cause of death was available for any year after 1990 (Mathers, et al., 2005, p.175) ". Uncertainty in estimated all-cause mortality rates is $\pm$ 15-20% in Africa Region (WHO Statistical Information System [WHOSIS], 2007). Homicide risk is believed to be high in the Africa Region, but the perception of how high is changing. It is no longer believed to be the world's most violent region (WHOSIS, 2007). Murray and Lopez (1996) estimated that in 1990 there were 205,000 homicide deaths in Sub-Saharan Africa; estimates for 2002 are 134,115 (GBDR, 2007).

These are only estimates because in Africa, even basic descriptive information on the incidence of violence at a country level was not readily available, and publicly available data are uneven and often unreliable. No country in Africa Region, except South Africa, has accurate national homicide statistics, and even theirs are only partial

(Norman et al., 2007). South Africa is one of the most violent countries in the world (male and female homicide rates were respectively 113.4/100,000 and 21/100,000 in 2002 (compared to Hong Kong for example, which has a very low homicide rate of 1.3/100,000, one third of which are female [Broadhurst, 1999]). Due in large part to its unique political history; South Africa is different from most other countries in that the burden from intentional injuries exceeds the burden from unintentional injuries.

The state of health information (including deaths and homicide deaths) is rudimentary in TZ (Harpham & Few, 2002). In DSM health evaluations are hampered by absence of any reliable utilization of health facility data, which could be used for example, to monitor change over time. This is partly linked to widely acknowledged problems with the national health management information system (Harpham & Few, 2002).

Until 2005 in TZ, the only data on homicide were from a population based surveillance conducted through the Adult Morbidity and Mortality Project (AMMP) which measured the rates and causes of mortality of Tanzanian residents in three communities on a six-monthly census cycle (one urban n = 64756 and 2 rural n=146,359) from 1992-1998. The urban community was in three (Ilala, Mtoni, and Keko) of DSMs seventy three wards (which are administrative areas each with a population between 5,000 and 90,000). These three wards were chosen logically with the best knowledge available, to be representative of all DSM. In those wards two-thirds of all deaths were due to communicable diseases such as AIDS, tuberculosis and malaria, and homicide was estimated as not more than 0.6% of overall mortality (Ministry of Health, 2001). Homicide rates per 100,000 population were reported by five broad age groups and sex;

the average age adjusted rate of homicide deaths for males was 16.5/100,000 and for females 3.4/100,000 (Moshiro et al., 2000).

The World Report on Violence and Health (WRVH) (Krug, Dahlberg, Mercy, Zwi & Lozano, 2002) presented alleged witchcraft as a possible risk factor for homicide death of elderly women in Tanzania. Before that Neki, Joinet, Ndosi, Kilonzo, Hauli, & Duvinage (1986) broached the subject of witchcraft in TZ. The upcoming Africa Report on Violence and Health (ARVH), states that elderly women in Ghana and neighboring Kenya can be treated maliciously (Mba, in Kobusingye et al., 2007).

Because of the lack of systematic and generalizable prior research, this region-wide violent death survey was instituted in DSM for year 2005 in order to describe the homicide rate, the individuals who were murdered, and the contextual circumstances.

Methods

This study was developed by following the WHO/CDC *Injury Surveillance Guidelines* (Holder et al., 2001) and adapting them to (a) the setting in DSM and (b) the exploratory intent of the research. A mixed methods approach was used, following the premise that a combination of approaches would provide better understanding than either approach alone (Creswell & Plano Clark, 2007). Data were collected at the Muhimbili National Hospital Mortuary on all homicide deaths that occurred in DSM between 1 January 2005 and 31 December 2005. The methods used for data collection and analysis have been described in detail (Outwater, Campbell, Rose et al., 2007). Briefly, the quantitative data was obtained either through interviewing relatives or the deceased of through police data entered in the Mortuary Registry Ledger. The quantitative variables measured were: sex, year of birth, date of death, place of residence, place and site of death, occupation, cause

of death, activity at time of death, weapon(s) used, alleged reason behind death, and relationship of perpetrator to the deceased. The qualitative data were responses from close kin to an open-ended question "Is there anything else you would like us to know?" as well as daily observations at the mortuary, and newspapers. All cases were described through quantitative data; two thirds of the cases also had qualitative data.

Newspapers provide important information for researchers (Bernard, 2000). For this study, every issue of eight newspapers influential in Tanzania was examined from 1 January - 30 June 2005 for any mention of homicide (see Table 4.1) or efforts to decrease violence in DSM. Five Swahili and three English language newspapers were followed of which six were privately owned (two were government owned) and five were dailies (three were weeklies). Pertinent articles were clipped and filed with the victim's case number. Newspapers were used to verify that each victim had been recorded in the Registration Ledger. In addition newspapers accounts added qualitative information to individual cases as well as giving insight to the public's perceptions of the event.

Definitions

Homicide death: includes ICD-10 codes X85-Y09: "due to injuries inflicted by another person with intent to injure or kill, by any means" (WHO, 2003). It excludes deaths as a result of war and legal interventions.

Gangs: any durable, street-oriented youth group whose own identity includes involvement in illegal activity according to a consensus definition of 100 gang scholars in the USA and Europe (Klein, 2005)

Femicide: Homicide death of women aged 15 years and over (Mouzos, 1999)

Infanticide: Homicide death before one year of age (Paulozzi, 2002)

Assault: in which an individual or small group (<10 people) kills an individual

Mob killing: in which a medium to large group (dozens to hundreds) of people, using multiple weapons, acting on a continuum from spontaneous to planned action, in concert kills an individual or a small group (Outwater, Campbell, Rose, Kinabo, Tarimo et al., 2008)

First-day neonaticide: Killing or abandonment of a neonate on its first day of life.

Early neonatal death: Death within 7 days of life (WHOSIS, 2007)

Late neonatal death: Death 8-28 days after birth (WHOSIS, 2007)

Intimate partners: current or former spouses, cohabiting or dating partners, and rejected suitors (Mathews, Abrahams, Jewkes, Martin, Lombard & Vetten, in press).)

Relative: blood relatives, not including parents

Employed person: currently employed in the sense that he/she worked for at least one hour on any of the wide range of economic activities or was temporarily absent from such activities, during the last calendar week (NBS, 2001).

Data Analysis

Quantitatively, frequency distributions, means, standard deviations, proportions, rates, t-tests, and probability tests (Chi2 and Fisher's Exact) were calculated as appropriate for each variable. Stratified and univariate analyses, age-specific and cause-specific mortality rates were calculated. (Three neonates with unrecorded sex were proportionately distributed for analysis: 2 as males and 1 as female.)

Qualitative data were analyzed by categorizing victims (Adult male [assault and mob], Adult female [intimate and non-intimate perpetrators], children [neonaticides and non-neonaticides]), coding the responses, and developing themes according to procedures

described by (Creswell and Plano Clark, 2007). Quantitative and qualitative data were linked through the Case number.

Newspaper data analysis

All newspaper articles were collected and filed by victim case number alongside the survey questionnaire and other related materials. Coding was performed using codes developed a priori from the surveillance questionnaire. A matrix was built with five variables (sex, age group, perpetrator, weapon, and occupation) and their codes that appeared in the data (see Table 4.2). For example fire and firearms do not appear in the matrix because those codes were not mentioned in any of the newspaper articles collected. Other codes emerged from the articles.

A ratio of total stories to total victims (January to June 2005) was calculated to express intensity of coverage. Intensity of coverage is used as a proxy for pubic interest. A ratio of one represented one newspaper story per case and indicated moderate public interest. Less than one indicated decreased interest, and more than one indicated increased public interest.

Geo-mapping analysis

Geomapping is being used imaginatively in many police departments in the United States, and promulgated for homicide analysis by WHO-VIP (Butchart et al., 2004). To analyze the geographic data from this study, maps were created with the program ArcGIS version 9.2. The primary element was the map frame of DSM bordered by the Indian Ocean (blue), and other Regions (brown). Upon this frame, was layered the geographical entity of DSM's wards. Information about which wards were rural, urban, and peri-urban was drawn from the program (see Figure 4.2); on-site experience verified

this information was generally accurate. Another layer of rivers and roads were added. Finally a dataset in Excel, of homicide deaths per 100,000 population by ward (derived from the 2002 Census, with added population of 4.3% per years 2003, 2004, 2005) was input to the program.

WHO Population Standard

To facilitate comparisons of sets of age-specific demographic rates across populations with different age *structure,* it is useful to calculate summary health statistics which remove the effects of variation in age *compositions* (Ahmad et al., 2007). WHO has adopted a standard which is based on the average age-structure of those populations to be compared (the world) over the likely period of time that the new standard will be used (25-30 years). Using the United Nations assessment for 1998 an average world population age-structure was constructed for the period 2000-2025 (Ahmad, Boschi-Pinto, Lopez, Murray, Lozano & Inoue, 2007) (see Table 4.3). Age standardized mortality rates per 100,000 homicide deaths for DSM were calculated by applying this standard world population. The DSM population was re-adjusted to the standard and then the number of expected deaths and age specific rates to this "new" population were calculated. The standardized age groups were compared with the geographical regional estimates from the GBDR 2002 database Version3. This standardization allows comparisons through a ratio between international sites even when they have different age structures.

Results

The results presented below include first, an overview of the total homicide death results. Then the data are presented quantitatively and qualitatively by three major categories:

adult males, adult females, and children <15 years. Adult males are further stratified by type of death: assault or mob. Adult females are stratified as to non-intimate and intimate partner violence.

Homicide overview

In DSM in 2005, 458 intentional injury deaths (including deaths resulting from homicide (367), suicide (65), and law enforcement (26)) occurred. Of all violent deaths, 80% were homicides. The crude homicide rate was 12.95/100,000. The age standardized (to the WHO Population) rate was 12.57. One group of 5 outliers was not included in further statistical analysis: an adult female and 4 children died of fire in their room in an undetermined incident that was possibly politically motivated. They were omitted because the incident was undetermined as to whether it was accident or homicide. If included, sex, age, manner, weapon, activity, and cause of death variables would be skewed inappropriately.

Of the homicide victims, 338 (93.4%) were male and 24(6.6%) were female (see Table 4.4). Their ages ranged from less than one day to 78 years. Ninety-nine percent of those killed were Tanzanians; the others were a Kenyan, a European and two Indians. The crude homicide rate for all males was 23.7/100,000; and for all females, it was 1.7/100,000 (see Table 4.5). The age standardized rates for males and females respectively were 22.26 and 2.65 (see Table 4.6).

Numbers of homicide deaths by age fell into a normal distribution which did not show evidence of skewness (Pearson's skewness coefficient 0.09). Figure 4.3 depicts the homicide rate per 100,000 people in five year age groups. Each column represents an age specific homicide rate per 100,000 population. The homicide rate for DSM was

6.72/100,000 in the 0-4 year group, and then receded to almost nil in the ages 5-14. The rate escalated sharply at around age 17, and peaked at a mean of 28.12 years (Standard Deviation 12.0 years). Two thirds of homicide deaths (66.85%) were in the 20-35 year age group. The homicide rate decreased until age 50-54, after which time it increased to relatively modest levels.

The perpetrators of homicide across all age groups over 7 months were overwhelmingly male. About 6% of overall murders were female perpetrated: a sister who stabbed her brother for attempted rape as part of an ongoing inheritance quarrel and 21 mothers who committed infanticide.

Location of Fatal Injury by District and Ward

Administratively DSM is divided into three districts, each of which is partially rural with one border on the Indian Ocean and another in the city center. Ilala, had the highest homicide rate per 100,000 of the three districts studied in DSM (see Table 4.7). Given the distribution of inhabitants among the three districts, we would expect the homicide rates to mirror the population proportions within each district after accounting for sampling variability. However, the homicide rate in Ilala, the central district and most urbanized was significantly higher, than the other two.

Excluding visitors (8) and those whose residence was not known (50), 91.1% of homicide victims died in the district in which they lived (see Table 4.8).

Administratively, DSM has 73 wards. Of the 273 victims for whom the ward where they had lived and where they were fatally injured is known, 67.4% (184), were killed in the same ward in which they had lived. The overall rate of murder ranged from zero in 22 wards to 89.1 per 100,000 in Jangwani ward. Eleven wards had more than ten

fatal injury events, including two wards with 28 deaths each. Less than nineteen per cent of the population experienced 49.1% of the homicide deaths (see Table 4.9).

A map of DSM was created depicting the analysis of homicide death per100,000 male population according to the ward in which the injury occurred (see Figure 4.4). The lightest areas depict the 22 wards in which no homicide deaths occurred. The darkest area denotes the ward Jangwani, in which the male homicide rate (137.9/100,000) was the most intense. Fourteen people were killed there, but only 6 were residents there. Jangwani neighbors the Central Market in the ward of Kariakoo, which had comparatively few assault deaths (3).

Very few urban wards experienced no homicide deaths; few very rural areas experienced any homicide deaths. Areas of high homicide risk are along major roads and new construction and the geographic center of homicide deaths is located near the urban center. The lowest levels of violence/100,000 population are almost all rural areas. Most pockets of low violence amidst high violence wards are usually still rural in character - such as the ward Goba (see Figure 4.4, 114) where there is not enough available water for viable settlement.

Although it was not possible to map the street of the fatal injury because of the lack of known street names in many areas and the vagueness of the data collected for this variable, it is possible to note from the verbal descriptions that most homicide injuries occurred in or near the area in which the deceased had lived. Of the victims for whom both the street where the deceased lived and the street where he was fatally injured (188, 52% of total deaths) was known, it was the same for 65% (122). Even for those for whom

different streets of residence and injury were recorded, the places were often within a kilometer.

Weapons

A variety of weapons were used. Half of homicide deaths were caused by blunt or sharp objects, (24.3% and 23.2% respectively). Being killed with kicks and punches (14.4%), strangling or asphyxiation (9.7%), fire (12.4%), or firearms (12.2%) was less common. Firearm deaths were usually victims of a robbery attempt, the robbers themselves, or bystanders. Guns were never wielded by relatives against each other.

Firearm deaths were usually victims of a robbery attempt, the robbers themselves, or bystanders (see Figure 4.5). Reasons for firearm deaths were significantly different between males and females X^2 (5,43) = 14.027, p = .015 (see Table 4.10) Males were more likely to die because of robbery attempts and females were more likely to die as bystanders to those events. Bystander events caused by firearms were evenly divided between the male and female populations.

Occupation

Some occupations did not experience homicide in DSM 2005: religious workers, NGO workers, tourists, refugees, elected officials, foreign officials, lawyers, bus drivers, journalists, musicians, sports figures, gas station attendants, hotel workers, and craftspeople. One homicide may have been politically motivated. A 40 year old ruling party youth leader from Zanzibar came to DSM for a meeting in November in preparation for the December elections; while staying at a guest house, he was shot by an armed robber. No evidence was found that any homicide was based on ethnicity or religion.

There were three general types of homicide: (a) assault, (b) mob killings, and (c) neonaticide.

Adult Males

In DSM 2005, 88.7% of all homicide deaths were adult males. All, except four, were native Tanzanians. Of the exceptions, one was a visiting Kenyan, and the others were long-term residents in Tanzania. Adult males died by two principle types of violence: assault or mob. There was newspaper coverage of 11.1% of the adult male homicide cases (see Table 4.2). The total stories/total cases ratio was 0.17 indicating that homicide of adult males is perceived to be of relatively low interest to newspaper readership. One of the two stories that received universal coverage was a man, but the universal coverage was due to the fact of the unusual circumstance that the perpetrator was a female relative, his sister.

Table 4.11 compares the percentages of occupations held by working age adults (NBS 2000/01, the closest year available) to those held by adults who died from homicide in 2005. Students, unpaid family help, and those who were self-employed with more than one employee, were murdered with a probability far less than chance would predict. While fewer employees were murdered than would be expected by chance, specific categories of employees were at high risk, especially taxi drivers. The large majority of homicide victims are working age males. More than half of male homicide victims were unemployed, Unknown (Unclaimed bodies buried by the City), or described as thieves; the probability of this happening by chance is extremely unlikely.

Assault

Quantitative data

In DSM in 2005, 108 adult males died from assaults which was 33.6% of all male homicides giving a rate of 11.12/100,000 assault homicides per adult male population. Adult males who died by assault ranged in age from 17 to 78 years (mean 34.5 years). In four incidents 2 people were killed. Four men were killed by relatives: 2 by their brothers, one by his sister, and a nephew by his guardian uncle.

About one-quarter of homicide deaths by assault took place in streets – many of the streets were smaller ones, and some, mere passageways between houses where people could be trapped. Thirty assaults occurred at a work place (including vehicles).

Knives were the most common weapons used against males who died in assaults (28.7%) (see Table 4.12). Firearm deaths (26.8%) were second most common and were not typically accompanied by other weapons; they were almost exclusively used in armed robberies. Twice armed robbers killed each other during a robbery. The three non-Tanzanian DSM residents, all died by firearms: one European as a bystander to a robbery, and two Indians by robbers. Guns were never wielded by relatives against each other.

The precipitating factors of 25 assault deaths were not known. Of known causes, most were related to theft: 42 (48.8%) were killed by robbers, 4 (4.65%) were killed as bystanders, and 10 (11.6%) were killed in the act of stealing.

The occupations of the men that suffered assault were varied and included drivers (15), small business owners (13), guards (9), skilled laborers (6), large business owners (4), professionals (4) and retirees (3).

Qualitative

There is qualitative data on 82 of the 108 (75.9%) men who died from assault. They died for various reasons. Six men died because of relationships with women. A

girl's mother killed the suitor caught inside the house, and an uncle killed his guardian nephew for bringing a girl in the house. There were two passion killings such as Case 09-2005 which was explained by an uncle:

> *Alikuwa anatembea na mke was mtu. Mume wa huyu mwanamke alikuwa amefungwa jela. Aliachiwa last November. Alifumamwa na mke wa mtu.*
>
> He was moving with the wife of a person. The husband of this woman had been jailed and was released last November. The deceased was caught in action with the wife.

Twice women arranged for their husbands to be killed. One of the husbands was semi-dependent and one was a professional accountant. A friend described what happened in the latter Case 258-2005, a 41 year old man.

> *"Aliende nyumbani saa 1 ½ usiku – mkewe hakuwepo...mlango ufunguliwe – mara waliingia majambazi wakambia marehemu sisi hatutaki chochote, tunaitaka roho yako. Tumetumwa na mkeo. Walianza kumshambulia kwa mapanga. Kichwani na tumbon walimchoma kisu. Mama yake marehemu walipiga panga la kichwani.*
>
> "He returned to the house at 7:30 PM – his wife was not there...the door opened – then armed robbers entered. They told the deceased we don't want anything, we want your soul. We are sent by your wife. They began to attack him with machetes. The head and stomach they stabbed with knifes. The mother of the deceased they hit with a panga in the head.

Men were also killed due to inheritance quarrels, and as bystanders to armed robbery. Occasionally during armed robberies, the criminals killed each other when

"his fellow made the bullet crazy" (Case 304-2005). Men were killed by paid guards for trespassing in agricultural fields. Drivers, especially taxi drivers, were at special risk. The stories behind taxi driver deaths were similar to one another. The police reported on Case 204-2005, a 23 year old man:

> *Siku ya tukio alichukuliwa na abiria waliomwambia awapeleke Ubungo. Njiani walio mwambia wapitie kwanza Mburahati. Tax driver alikubali. Walipofika Mburahati walimnyan'ganya gari. Walipiga risasi mgongoni. Risasi moja ilikutwa kwenye mabavu. Majambazi walitokomea na gari.*
>
> The day of the event he took some passengers that asked him to take them to Ubungo*. On the way they told him to pass first at Mburahati*. The taxi driver agreed. When they arrived at Mburahati they seized the car. They shot him in the back. One bullet was found in the ribs. The armed robbers went off with the car.

(* See Figure 4.4 to follow the route.)

Friends and acquaintances killed one another for many different, seemingly petty reasons including refusing to: pay for a TZS.50 ($0.05) piece of pineapple or a cigarette, repay small loans of ($0.05, $5, $7), and give small loans ($2). A relative described what happens when resources are scarce even when people know each other well. Case 333-2005 was a thirty-nine year old man who was stabbed by a friend:

> They were from one village. They studied together. They worked together washing cars. Three times they fought – about water to wash the cars. If there is no water there is anger. There is no water any place. If there is no money, life is short.

Many people were victims of robbery. A special group was owners of small kiosks. On their way to the large central market vegetable and fruit wholesale market, carrying money to buy goods to sell in their small retail shops they were attacked by thieves. Several men were killed on the way to Kariakoo in the manner of Case 41-2005 as described by his brother.

> *Alikuwa mfanyabiashara wa genge – Vingunguti. Alitoka nyumbani asubuhi saa 12 kwenda Kariakoo kununua vitu. Hakurudi tena nyumbani. Ndugu walijitahidi kumwita. Waliimkuta Morchuari. Aliokotwa Jangwani ...Alishambuliwa na vibaka hadi kumua. Shingo limevunjikwa.*

> "He was a businessman of a kiosk in Vingunguti*. He left the house in the morning at 6, to go to Kariakoo* to buy things (wholesale). He didn't return home again. His relatives... met him at the Mortuary. He was found at Jangwani*.... He was attacked by robbers until they killed him. His neck was broken."

(* See Figure 4.4 to follow his route.)

Mob

Quantitative

In DSM in 2005, 205 males died due to mob violence, (57% of all homicide deaths, and 61% of all male homicide deaths), giving a rate of 21.2/100,000 adult male population. Those who die from mob violence are significantly different from those who died from assault in age, occupation, weapons used, and injury site (see Table 4.12). The median age for those who died of mob violence was younger and the age range more narrow; the mean age of those who died from mob violence was 7 years younger than those who died from assault, t (313) = 6.5035, p = <0001. (Note: The actual age range is even wider since assault deaths occurred throughout the lifespan [from several months -

78 years] and mob deaths occurred to young and middle aged adults [17 - 50 years]). Occupations of those who died from mob violence and assault were significantly different, X^2 (7, 313) = 68.1534, p = <0001. Seventy four per cent of mob deaths vs. 31.5% of assault deaths were unemployed, alleged thieves, or buried by the City as unknowns. Employees consisted of 7.8% of mob deaths vs. 36.1% of assault deaths.

Different weapons were used in mob and assault deaths, X^2 (6, 313) = 80.46, p = <0001. Weapons in mob deaths were often materials at hand including bodily force through fists and feet, blunt objects such as stones, cement blocks and iron bars, and sharp objects such as knifes and machetes. Fire accounted for 20% of mob deaths. Firearms were rarely used (2.4%). In contrast, assault deaths were rarely caused by fire (3.8%) and most commonly caused by guns (26.8%) and sharp weapons (28.7%).

The fatal injury location was also significantly different for males who died from mob violence compared to those who died from assault X2 *(5, 313) = 124.43, p = <0001.* Streets or other public spaces were the injury sites for three-quarters of mob deaths. Only 27.8% of assaults occurred in public spaces, while one third occurred at places of businesses. All male homicides that occurred in a person's own home were assaults. At least three cases of mob violence involved the death of two people.

Qualitative

Of the 205 male mob deaths, qualitative data were available on 129, much of which has been reported in Outwater, Campbell, Rose, Kinabo, Tarimo et al. (2008). Although only 6.3% of deaths due to mob violence were reported by any newspaper (see Table 4.2), newspapers provided the most information about what triggered the mob:

" ...the driver raised alarm and some people around came to his rescue..." (Case 430-2005) "The inhabitants...at 3AM...awoke to the shouts of thief, thief...from one of their neighbors..." (Case 422-2005). "ZA [name given] (45)...untangled herself [from attempted rape] by shouting for help, upon which a group of people appeared for the reason of giving help..." (Case 188-2005) "...three bandits ambushed SS [name given] (38)...she raised an alarm, Good Samaritans gave chase..."(Case 339-2005)

Two men were killed by a community mob for murdering a respected elderly man who was a witness to a case. One man was killed after the 45 year old woman he was attempting to rape cried out. All other male victims of mob violence were killed as thieves or as alleged thieves. These data cannot differentiate between mob violence and vigilantism in every case. Although most mob deaths appear to be a result of spontaneous citizen action, there is also evidence of several cases of vigilantism around the Central Market of Kariakoo as was reported by an uncle of Case 106-2005:

> Alitoka nyumbani kwenda sokoni Kariakoo. Alikuta na watu waliokuwa wanafukuza kuwa ni wezi. Wali watu waliokuwa wanawafukuza wezi bila hata kujua huyu sio wmizi. Walianza kumshambulia na mapanga hadi kufa.
>
> He left the house to go to the market in Kariakoo. He met together with people who were chasing away thieves. Those people who were chasing away thieves without even knowing that he wasn't a thief. They began to attack him with a machete, until he died.

Adult Females

Assault

Quantitative

In DSM in 2005, 17 adult (≥15 years) females were murdered (4.7% of all homicide deaths) for a rate of 1.82/100,000 adult female population. Femicides occurred in all three districts without significant difference. The ward with the most male homicide deaths had no female homicide deaths; in Mbagala the rate of being murdered and male was 28/40220 = 69.62/100,000, while the rate of being female in Mbagala and murdered was nil. Femicides occurred in 13 different wards and no more than two women died in any one ward. No ward had only female deaths. Women killed ranged in age from 20-62 years. Their mean age of death was 33.5. Femicides were perceived to be of great interest to the newspaper readers with an interest ratio of stories: cases of 1.27 (compared to the male ratio of 0.17)

When adult male and female homicide incident characteristics are compared, they were significantly different in type of homicide X^2 (2, 338) = 25.4226, p = <0.0001, perpetrator, primary weapon used, and injury site (see Table 4.13). With the exception of one who died of mob violence, all females died of assault.

When female assault victims are compared to male assault victims (thereby not including mob victims) no significant differences are found for mean age t (124) = 0.5281, p = .5984) or primary weapon used X^2 square (5,124) = 16.0458, p = .6431 (see Table 4.14). Equal numbers of men and women died as bystanders to robberies, as could be expected from an apparently random event. Large differences between males and females were found for perpetrator X^2 (6, 124) = 43.4861, p = <0.0001, injury site X^2 (5, 124) = 16.0458, p = 0. 0067 and reason for death X^2 (6, 124) 28.8952, p = <0.0001 respectively. Males were most likely to be killed by acquaintances and strangers, while females were most likely to be killed by intimate partners. Males were more likely to be

killed in the street, other people's homes, and places of business. Females were more likely to be killed at home (although more men died at home [11] than women [8]). Males were more likely to die as victims of robbers, while females were proportionately more likely to die as a result of arguments and as bystanders. No females were killed as a result of stealing.

In Tanzania almost equal numbers of women died inside their home compound (8) as outside it (9) (Table 4.15). A larger number of non-intimate femicides (5) took place in the home than intimate partner femicides (3), although the percentage was smaller (41.7% and 60% respectively). In Tanzania, equal numbers of women and men died as bystanders (4 each) and equal numbers of women died as bystanders inside (2) and outside their homes (2). The home does not seem to be more or less dangerous than the streets for a woman.

While the sample of murdered females was too small to draw definitive conclusions about occupation, homemakers were most protected from homicide death and that those who were self-employed without employees were most at risk (see Table 4.11). The female sample size was too small to be able to discover significant patterns in the type of weapons used but it appears similar to males who died from assault. The deaths of most women were precipitated by on-going arguments (6) with those with whom they were close, and as bystanders to an armed robbery (4). Sexual assault homicides were two, both whom probably died of strangulation.

Qualitative

Qualitative data (including interviews with next of kin, friends, and police, newspapers and mortuary-based observations) were available on all femicides, except

one. One woman died from mob violence - a middle-aged women reported to have been retarded due to epilepsy who was killed as a witch (Case 253-2005). Two-thirds of the female victims were covered in the media, including two of the five intimate partner femicide. Stories about homicides involving females were of strong interest to the media (see Table 4.2). The one case reported in (a) in every local newspaper, and (b) followed up, was when a son killed his mother. The other story that appeared in all newspapers was when a sister killed her brother, the only homicide of an adult by a female. Both were outlier singleton events and involved on-going inheritance quarrels focused on houses in which both parties were living.

Little information is available about the two women who died of sexual assault; one of them was the only woman never identified. Three other women were killed by robbers. Four femicides were bystander events and were described similarly such as the description of the homicide of a sixty two year old woman (Case 342-2005), by her relatives

> This was an accident. Armed robbers were trying to steal from the shop next door. She looked outside her door carefully to see what the shouting was all about. And they shot her dead.

Intimate Partners

Quantitative

Of all homicides, 1.94% (n=7) were by intimate partners. (Two men, who were killed by groups of men at the behest of their wives, were coded as intimate partner homicides for a rate of 0.14/100,000.) Five women intimate partner deaths occurred for a

rate of 0.535/100,000 among females 15 years and older. One woman was killed by her husband, 2 were killed by cohabiting or dating partners, and 2 by rejected suitors.

When comparing the sample of intimate partners (5) with non-intimate partners, no significant differences were found for mean age t (17) = 1.0448. p = .3127, weapon used X^2 (5,17) = 8.5708, p = .1275, or injury site X^2 (5,15) = 7.9688, p = .158 (see Table 4.15). Of the five women who died from intimate partner violence only one was a dependent (a diploma student); of the remaining, 2 were employed and 2 were small business owners (without employees). Lack of statistical power limits the ability to know if the non-significant results would have been significant with a larger sample.

Qualitative

The stories behind intimate partner violence were varied (see Table 14.16). One was killed by her husband for unknown reasons; the other four women were killed because of jealousy (2) and by rejected suitors (2), one of whom attempted suicide after the murder. No woman was described as pregnant when she was killed.

Children

Quantitative

In DSM in 2005, 24 children died from interpersonal violence (6.6% of homicide deaths), giving a rate of (24 / 931,301) 2.57 per 100,000 population under fifteen years. Only two of these children were older than four years old, and both of them, a boy and a girl, died as bystanders to other crimes. A two year old boy was found in a graveyard and was believed by relatives and neighbors to have been taken for witchcraft.

Twenty one (87.5%) children were classified as infanticides (killed at < one year of age). Fifteen infanticides were male (95%CL 47.8 – 88.7) and six were female (95%

CL 11.3 – 52.2), which is not significantly different, and suggests that girl children were not selectively killed. The infanticides were all less than seven months.

Nineteen of the 21 infanticides were apparently abandoned or discarded on their first day of life and were categorized as first-day neonaticides. Therefore, nineteen of 68,554 children born in DSM in 2005, were first-day neonaticides for a rate of 27.7/100,000 (43.3/100,000 male births and 17.6/100,000 female births (see Table 4.5).

Qualitative

There were no responses to open-ended questions regarding the child homicides. Children were of low-moderate interest to the media, one-quarter of cases were reported (see Table 4.2). Newspaper entries were typically brief on neonaticides, as was reported in the *Daily News* on Case 432-2005 :

> "…a one day old baby girl, whose body, which was wrapped in a paper bag, was found dumped at a bus stand. No one was arrested in connection with the incident and the police are continuing their investigation…"

Neonaticides were brought into the Mortuary by the Police wrapped in a khanga (traditional cloth) or a cheap basket woven from palm fronds. Often the placenta would be tucked underneath, confirming age.

The perpetrators were assumed by police to be the mothers. Two perpetrators were discovered. One mother was a single primapara aged 22, and the other was aged 31 with 3 children whose husband had traveled to his village a long time ago seeking treatment for an undisclosed illness. Both women believed that her employer was the

father of the neonate. Both cases received coverage in more than one newspaper accompanied by photos. The newspaper articles about these two cases expressed outrage. One headline read "*Huu ni Uhitler*" ("This is Hitler-ian"). The mother of Case 134-2005 is shown in the accompanying photo to be wearing the conservative clothes of a poor but respectably attractive middle aged woman. The 600-word front page story was based on an interview with the neighbor who confirmed they had lived as good and close neighbors. Embedded in the story were sympathy for the woman and the consequences of her being taken to prison.

> *" Kabla ya tukio hilo kutokea tumekuwa tukiishi naye vizuri na hakuna mtu aliyewaza kwamba angeweza kufanya kitendo kama hicho... mtoto mwenye asili ya Kiarabu wakati mumewe ambaye ni Mswahili akiwa amesafiri kwenda kwao...Kwa kweli inasikitisha sana kwani ameache wanae hapa nyumbani wanateseka sana hasa huyu mdogo ambaye haishi kulia japo shangazi yao ndiyo amekuja kuwalea."*
>
> "Before this event occurred, we have lived with her well and there is not a person who would imagine that she would do a deed like this....The child himself has the origins of an Arab while her husband who is a Swahili was traveling to their home...For truth it makes me very sad because she has left her (three) children here at the house. They are suffering a lot especially that little one that does not stop crying. A paternal aunt indeed has come to raise them."

Discussion

In the next section, the overall homicide rate is discussed first, including male: female ratio, age, urbanization, weapons, occupation, and political factors. Then rates among adult males, adult females and children are discussed followed by the value of newspaper coverage.

In DSM, the Household Budget Survey reflects the fiscal constraints imposed by Tanzania's structural adjustment program, i.e. World Bank conditions that led to privatization of government owned assets and government retrenchment in the 1990's (NBS, 2002). These policies have led to an overall sharp decrease from 1991 to 2000 in: formal employment, businesses with more than one employee, male and female students, and fishing (NBS, 2002). Agriculture gained slightly in importance (with a changed emphasis of selling food crops over cash crops), as did the percentage of unemployed, those working without pay, the "self-employed without employees", the precarious life of the "informal business sector", (selling farm produce and small goods on the street) increased 14-fold and has become the main economic pursuit of about one-quarter of adult males in DSM.

The age standardized rate for males was 22.26/100,000 is below the rate for most major cities in the United States (CDC Wonder, 2004) (see Figure 4.6). For males the DSM: Global Comparative Mortality Ratio was 1.56 and the DSM: Africa ratio was 0.7 (see Table 4.19). The age standardized ratio of the overall male homicide Comparative Mortality Ratio in DSM and in South Africa (Norman et al., 2007) is 0.19. In other words, for males, risk of homicide is greater in DSM than the world average, but is lower than what is estimated for Africa or South Africa. For females, the DSM: Global Comparative Mortality Ratio was 0.72 and the DSM: Africa ratio was 0.33 (see Table 4.19). The comparative mortality ratio with South Africa (Norman et al., 2007) was 0.13 showing that the female ratio is low compared to global and Africa Region ratios. Because of the large variability in estimates in data for Africa Region (WHOSIS, 2007), little can be said about comparing Africa and DSM mortality rates at this point except

that these data suggest that DSM rates are lower than at least some in Africa and support the ongoing trend of decreasing homicide estimates in Africa Region.

The UN Crime Trends Survey which relies largely on interviews with the populous, reveals regional differences in the incidence of fatal violence in Africa; South and West African regions have considerably higher rates of murder than the relatively low incidences recorded in East Africa (Naude, Prinsloo & Ladikos, 2006).

In South Africa, the only other SSA country with comparable figures, the age standardized homicide rate in 2000 was 64.8/100,000 (Norman et al., 2007). The age standardized Comparative Mortality Ratio of the overall male homicide death rate/100,000 in DSM and in South Africa (Norman et al., 2007) is 0.19. It should be noted that South Africa (contrary to usual practice) does not distinguish between legal (police) (which were a "probably small" number) and civilian homicides in their overall rates (Norman et al. 2007, p.21). However, in spite of that slight homicide rate inflation, comparing the data reported here to South African data confirms that homicide rates in SSA vary. There are considerable differences in the homicide rates between major South African cities, ranging from Cape Town (population 3.1 million) with a homicide rate of 60 per 100,000 population to Pretoria/Tshwane, (population 2.1 million) with a homicide rate of 20.7 per 100,000 population (Prinsloo et al., in press) (see Figure 4.3). The rate in DSM at 13 per 100,000 population was lower than any South African city.

The homicide rate is not extremely low in DSM, as is found in cities such as Hong Kong (1.3/100,000, one third of which are female) (Broadhurst, 1999). However the overall rate is relatively low compared to many cities around the world (e.g. in the US) and for other comparable cities in low income settings(see Figure 4.6).

DSM AMMP data

In DSM there are differences between the Adult Mortality and Morbidity Project [AMMP] (Moshiro et al., 2000) and the current data set (see Table 4.17). The differences in rates may be due to change in incidence of homicide between the 1990's and 2005; this possibility cannot be evaluated. Some of the differences may be due to randomness from a small sample size for infanticides (0-4 years), children (5-14), and adults older than 60. In 2005, in those wards of Keko, Ilala, and Mtoni (where the AMMP data were collected), only one infant, and no children or elderly, were recorded as having been killed.

Some of the differences between the data sets are likely due to the results of different study designs. The present study was mortuary-based. The AMMP was based on a population-based household survey. Enumerators visited the same households every six months, asking a responsible adult through the technique of verbal autopsy about household mortalities in the previous period.

Verbal autopsy, a method of finding out the cause of death based on an interview with next of kin or caregivers, is being used more frequently in places where civil registration and death certification systems are weak, and was used in the AMMP study. When evaluated, verbal autopsy has been shown to be able to distinguish homicide as a cause of death with a high level of accuracy (Adjuik et al., 2006; Baiden et al., 2006; Chandramohan, Setel & Quigley, 2001). In Cape Town, for example, a study to investigate the quality of cause of death information, found that agreement of homicide determined by verbal autopsy (n=53) with the ICD (International Classification of

Disease) was 98% (Bradshaw, Groenewalk, Bourne, Mahomed, Nojilana, Daniels & Nixon, 2006).

However even if the data collected through the population-based study using verbal autopsies were accurate, any deceased without an established household or living in a household of 1 would have been lost to the study, suggesting increased accuracy for the current investigation where any body of a person without an established household in 2005 would have arrived at the MNH Mortuary and been counted. The bodies of 23.4% of 2005 homicides were buried by the City as Unknowns implying that they did not have a household to identify and claim them.

Male: Female ratio

The findings of this study confirm what has been found in many settings around the world: overall, women have a lower risk of victimization than men (e.g. Krug et al., 2002; Mouzos, 1999; Murray & Lopez, 1997). The global male: female ratio is estimated to be 14.22: 3.69 or 3.85 (see Table 4.19). In Africa Region, previous research indicates that males were four to ten times more likely to be murdered than females (Outwater et al., 2007).

The ratio of male:female homicide death found in DSM was 14. This extreme male:female ratio has been reported once before in the academic literature of Africa region - in South Africa at the height of the fight against apartheid (see Table 4.18). A similar ratio was found in Cali, Colombia in the early 1990's during a time of drug-related violence, when the crude homicide rate had skyrocketed from 23/100,000 to 124/homicides per 100,000 residents in one decade (Concha-Eastman et al., 2002). The overall risk for homicide for males was 16 times higher than for females (209 and 13 per

100,000 respectively). Men aged 25-29 years had the highest rate of homicide: 450/100,000. During this time the rate of femicide remained relatively constant. The gender gap narrowed when the male homicide rate decreased.

By way of comparison, a sample of all homicides identified by the Australian Police from 1989-1998, revealed an annual rate of 2.4/100,000 males and 1.4/100,000 females, with an overall ratio of 1.7 (1913:1125) (Mouzos, 1999). In Scotland, the ratio was 4 (Scottish Government, 2005) (see Table 4.18). From 1995-2004 in Scotland, as was found in Cali Colombia, the female homicide rate was relatively stable while the male rate fluctuated dramatically from year to year (e.g. from 4.7/100,000 in 1998 to 9.8/100,000 in 1999).

In Dar es Salaam the gender ratio in the male: female homicide rates of children under age 15, was 2.43, however the rates between the sexes were not significantly different,t X^2 (3, 24) = 3.2557, p = 0.354 . Similarly, Knobel, De Jilliers, Parry, & Botha, 1984 found that over a fifteen year period in Cape Town South Africa, the gender ratio for children's homicide death was 1.3. For children 0-4 years old, the male:female ratio was estimated to be 1.41 in Africa; in DSM the ratio was 2.66. The difference between the rates of homicide between boys and girls in DSM was not significantly different (Fisher's exact p-value 0.727).

Age

Although there is considerable variation in the incidence of homicide within specific age categories from region to region, the demographic distribution of homicide in Africa in terms of age and sex is broadly consistent with other regions of the world (Reza, Mercy & Krug, 2001). Children appear to be relatively protected, with the risk of

homicide rising sharply in the 15-19 year group, peaking in the 20-29 year group and remaining high until about 44 whereupon the risk drops.

While overall rates of violence in Africa differ, it is apparent from Table 4 that the overall pattern is the same: a risky first day, a relatively protected childhood with risk, especially for males, increasing sharply from ages 15 - 17 peaking at around 30 years and decreasing to moderate rates in ages 50-60. The overall pattern of homicide death is similar in these 5 African cities with DSM's overall homicide risk peaking at 30.4/100,000 in the 30-34 year age group with an overall risk of 13/100,000. In South Africa, the Cape Town and Durban homicide rates peaked earlier in the 25-29 age group (at 142.6/100,000 and 123.5/100,000 respectively). Like DSM, homicide rates in Johannesburg and Tshwane peaked in the 30-34 year age group, but their rates were much higher (91.2 and 43.3 respectively). The only DSM ward that equaled Cape Town and Durban homicide rates was Jangwani.

The same pattern was seen in Cali, Colombia (Concha-Eastman, Espitia, Espinosa & Guerrero, 2002). Likewise in Australia, Mouzos (1999) reported a relatively high homicide rate on the first day of birth (2.6/100,000) which declined to almost 0 at age 12 years, at which point the rate started to increase to a relative high between age 20-32 (3/100,000), and decrease to a mid-range from *45-55* through old age, for males and females (Mouzos, 2005).

Urbanization

The scenario for DSM is similar to that of many other major African urban centers in terms of urbanization. In Africa, urbanization has steadily increased from 11.2% of the population in 1950 to 35.2% in 2005, an increase which is expected in 2030,

to include 48.3% of the population (United Nations Secretariat, 2006). There are different types of transition zones between city and countryside, between what is unambiguously "urban" and supposedly typically "rural". These transition zones – generally known as "peri-urban areas" in English - vary in width and nature, and are subject to rapid change with increasing urban pressures (Simon, McGregor & Nsiah-Gyabaah, 2004). Many indigenous villages, previously located in rural areas at considerable distance from the city, have experienced inmigration, growth, changes in population composition, land use and economic base. As a generalization, the closer the city comes, the more pronounced is the transition from "rural" to "urban" characteristics. Eventually, these settlements become part of the built-up urban area, which then comprises a complex mixture of formal houses, shanties, rural huts and other dwellings (Simon et al., 2004). Urbanization in itself may be an important structural risk-factor for interpersonal violence, even as it is also an important factor in driving economic growth and development (Kobusingye et al., 2007).

The built-up areas of DSM increased at an annual rate of 2.2% between 1945 and 1967, but between 1992 and 1997 the annual growth rate increased to 10.1% (Caldas de Castro, Yamagata, Mtasiwa, Tanner, Utzinger, Keiser, & Singer, 2004) (see Figure 4.2 for urbanized areas in 2005). It is estimated that the urban area in DSM expanded from approximately 93 km^2 in 1978, 259 km^2 in 1992, and 418 km^2 in 1998. Until about 1992 urban development had occurred in a ribbon-like fashion along the main roads. Now this pattern is changing to infill of the ribbon developments, and increasing housing density, especially along the main roads (Briggs & Mwamfupe, 2000).

Map analysis in DSM revealed that high levels of homicide deaths clustered around the city center and the more urbanized areas, and were not present in rural areas. It becomes clear by triangulating the quantitative and the qualitative data, with the mapping, that the ward of Jangwani is of special concern. It has the highest deaths per 100,000. Of the 14 people killed there, only 6 were residents. The others were mostly small businessmen walking from other parts of the city to the central market Kariakoo with enough money to buy wholesale goods for their retail kiosks. They were killed during the commission of a robbery.

The finding that the death rate is correlated with urbanization is consistent with other research. Crime rates are generally found higher in urban areas in both high and low income countries (Leggett, Louw, Schonteich & Sekonyane, 2003). In Dar es Salaam there was extreme variability between ward homicide rates (from 0 to 89/100,000), with clustering in more urban areas. Nineteen per cent of the population lived in the area where almost half of the homicide deaths occurred (see Table 4.9). Clustering was found to a lesser degree in Cali, Colombia where 37% of the population lived in the area where 50% of the homicides occurred, and the highest rate was at a location near city center (for map see Guerrero, 2007). In Cape Town Metropole, according to spatial data, 60% of homicides were concentrated in 10 'homicide areas" (Lerer, Matzopoulos, & Bradshaw, 1995).

As in DSM, almost ninety percent of homicide deaths in Cali, Colombia occurred in the same area in which the victim had resided. In both cities, the large majority of homicides took place in streets or other public places. In DSM and Cali, 16.8% and 6% respectively of homicides occurred in homes or other residential settings. In Cali the

gender differences were not reported. In Tanzania a lower percentage of men were killed at their homes than women (3.5% and 41% respectively), as was also found in South Africa (32% versus 42%), although the difference was not as extreme. In TZ, although a far smaller percentage of male homicides occurred in the home, the actual number of males who died at home (11) was larger than females (8).

Weapons

It is estimated that the African continent carries approximately 18% of the global burden of firearm deaths – the vast majority of which are homicides (Krug et al.2002). In the extreme case of South Africa, gunshot injuries were the most common cause of death, accounting for more than half of all homicides (Matzopoulous et al., 2005). In contrast, firearm injuries accounted for 12.2% of homicide deaths in DSM in 2005. Firearms are generally illegal to own, and anecdotally cost about $400 (more than the average per capita annual income). It is believed that firearm ownership in DSM is relatively low.

In Europe and North America, a positive correlation between national rates of household gun ownership and homicide has been discovered (Killias, 1993). Since the homicide rates by means other than a gun were independent of the rate of gun ownership, it appears that residents of countries with low rates of gun ownership did not use other means more frequently to commit homicide. A recent study showed an even stronger correlation between homicide rates and firearm ownership across five African countries (0.917) compared to 0.522 in 34 other countries globally (Naude, 2007). The availability and use of firearms in interpersonal violence is a strong predictor of more serious injuries and higher mortality rates.

Firearm use in Africa region may be increasing (Kobusingye et al., 2007); trends in Cape Town, South Africa appear to support this (Outwater et al., 2007). However, most homicides in the Africa region are probably committed using sharp weapons, and firearms do not appear to have historically been a predominant cause of homicide death (Outwater et al., 2007). This was the case in Tanzania, but no agent was predominant. Most homicide deaths in DSM were mob related; and then, weapons at hand were used.

In the United States since 1970, 60-70% of homicides have been committed by people using guns, which are cheap and easy to procure (Cook & Moore, 1999). The type of weapon used is important in determining whether the victim survives; for example, the fatality rate for gun robbery is 3 times as high as for robberies with knives and 10 times as high as for robberies with other weapons (Cook, 1987). Many juvenile homicide offenders in the US did not have "the physical ability or the emotional detachment to use other weapons such as knives or fists" (Heide, 1999). In the US, 41% of households have at least one firearm (Cook & Moore, 1999). The easy availability and low cost of firearms, especially handguns, is believed to be an important component of the relatively high homicide rate (Teret, 1986; Webster, Vernick & Hepburn, 2002). In DSM, the low rate of firearm ownership and use may be reasons why the homicide risk is not higher.

Occupation

An extremely high youth unemployment rate in Sub-Saharan Africa is widely acknowledged. Even the official unemployment rate of approximately 20% "suffers from mis-measurement and does not capture the working poverty and underemployment"

(United Nations, 2005). South Africa during the most violent years reported 40% formal sector unemployment in the economically active population (Gilbert, 1994).

In Los Angeles, Leovy (2007) has documented a close homicide - unemployment lagged correlation between the years 1991 to mid-2007. Oscillations in the unemployment trend follow those of the homicide trend. For example when the number of homicides was low in 1999, the unemployment rate was low in 2000; when the homicide number increased and then moved down in 2002 the unemployment rate mirrored that change in 2003. Campbell et al. (2003) found that male unemployment was the strongest risk factor for intimate femicide.

Occupation is an especially important variable because it is potentially malleable through intervention (in ways that e.g. age, and sex are not). In DSM, the Household Budget Survey reflects the fiscal constraints imposed by Tanzania's structural adjustment program, i.e. World Bank conditions that led to privatization of government owned assets and government retrenchment in the 1990's (NBS, 2002). An overall sharp decrease in formal employment and businesses with more than one employee occurred from 1991 to 2000 (NBS, 2002). The percentage of adult male and female students also declined. Agriculture gained slightly in importance (with a changed emphasis of selling food crops over cash crops). The importance of fishing as a source of cash income decreased (NBS, 2002, p.60). The unemployed and those working without pay have increased (NBS, 2002). Small and petty business increased 14-fold. Coded as "self-employment without employees", the precarious life of the "informal business sector", selling farm produce and small goods on the street has become the main economic pursuit of about one-quarter of adult males in DSM.

That more than half of male homicide victims were unemployed, buried by the city, or described as thieves underscores Naude et al.'s (2006) observation that petty crime and its associated violence is sharply exacerbated by millions of uneducated, unemployed male youth (Naude et al., 2006).

Politics

Politically, 2005 was an election year which some observers feared could be violent. During 2005, government, secular, and both Christian and Moslem religious leaders campaigned vigorously for an election year of peace and stability (ref. newspaper articles). New voter registration cards were printed for each adult, and voting procedures were posted at accessible public places. Churches and mosque preached for peace. The effectiveness of the approach is supported in DSM in that only one person seems to have died from political violence.

Adult Males

The precipitating factors of 90% of all murdered males in DSM were directly related to resources as: thieves and alleged thieves (69%), victims of armed robbery (13%), bystanders (4%) and quarrels around payment and sharing (4%). This appears to contrast with other findings. For example, using Interpol data (based on crime reported to the police), Ortega, Corzine, Burnett and Poyer (1992) (as reported in LaFree, 1999) found a negative correlation between homicide and theft rates on the African continent during the years 1969-1982; however the data sent to Interpol by individual countries at that time, would have been inadequate to arrive at a meaningful conclusion (see Outwater et al., 2007). In Nigeria, psychiatrists interviewing jailed perpetrators found that less than 20% had committed murder for economic, criminal or psychological reward; however

this may be a result of a skewed sample of perpetrators expressing socially acceptable motives before trial (Ogungbemi & Ahmed, 1993). Therefore, it is not known if the preponderance of homicides around resources as found in DSM, is representative of Africa or not.

In the US though, where homicide statistics were reliable, between years 1976 - 1994, homicides related to index crimes of rape, robbery and burglary varied between 10-22%, decreasing over time. Narcotics crimes (which could be categorized as resource related crimes) never rose above 6% of the total number of homicides. Thirty-forty percent of US homicides were categorized as having been the result of arguments (Zahn and McCall, 1999). By contrast in DSM, where lack of economic resources appear to be driving homicide rates, only 9.4% of homicides were precipitated by arguments (35.3% of adult females and 8.7% of adult males).

Mob Violence

Mob violence at the community level is recorded all over the world and has been documented in organization reports (such as Humans Right Watch, and the United States Department of State Country Reports), newspapers and travel literature. Recent accounts of recent mob and vigilante violence in Africa have come from within the countries of Benin, Burundi, Cameroon, Central African Republic, Democratic Republic of Congo, Ghana, Kenya, Liberia, Malawi, Mozambique, Niger, Nigeria, Sierra Leone, South Africa, United Republic of Tanzania, Uganda, and Zimbabwe.

It is not known how many of Africa's homicides are a result of mob violence but it is believed to vary widely. Mob violence has been reported before in Tanzania (Neki et al., 1986; Ng'walali & Kitinya ,2006). Ng'walali and Kitinya found that in DSM from

2000-2004, 1249 people were killed by mob violence (mean/year: 252, range: 198-301). Since this present research found that in year 2005, 205 males and 1 female were killed by mob violence, it appears that mob violence is an ongoing phenomenon and it cannot be ascertained yet whether or not the trend is increasing or declining. In DSM 2005, it was found that 57% of all homicides were committed by mobs (Outwater et al., 2007). In Uganda, between January and November 2004, the Uganda Police registered 146 cases of mob violence (Mugunga, 2005) (see Table 4.20). (How many other cases of homicide were registered or the base-line population were not reported.) Otherwise, mob violence is little described in the academic literature of Africa.

Mob violence is a collective action arising against individuals or small groups, who are perceived as threatening social safety, stability, or norms (Mugunga, 2005). In Bahia, Brazil it was concluded that dissatisfaction with the police, the justice system and prisons increased the use of unofficial modes of justice (Noronha, Machado, Tapparelli, Cordeiro, Laranjeira, & Santos, 1999). A distinguishing feature of mob violence is that the main goal is not personal gain, but rather a way to protect the community.

Mob violence occurs on a continuum of spontaneity (Mugunga, 2005):

Mob "justice"	Vigilantism	Vigilantism
No prior mobilization	Temporary	Formal, Registered
Spontaneous		Planned

On one end of the continuum, there is no prior mobilisation, no structures and the mob is restricted to those who happen to be at the scene or within the community (Mugunga, 2005). On the other end is vigilantism which refers to a group that has used

forethought in the punishing of an individual (Mugunga, 2005). Vigilantism includes semi-organized groups that decide to address a problem. An organization or committee may be formed for the pre-meditated purpose of protecting the community, by suppressing and punishing deviants as has been seen in South Africa and Nigeria (Buur & Jensen, 2004). The most well-researched cases of vigilantism are the historic "lynchings" that occurred in the United States (e.g. Allen, Als, Lewis, & Liwack, 2000; Corzine, Huff-Corzine, & Nelson, 2006; Leader, Mullen, & Abrams, 2007). Many of them occurred when a community mob forcibly took alleged perpetrators already under legal custody (Allen et al., 2000).

The finding that mob violence is largely directed against male thieves, is confirmed by data from neighboring Uganda (FHRI, 2004; Mugunga, 2005) (see Table 4.20) and numerous reports and newspaper articles from throughout Africa region (British Broadcasting Company [BBC], 2000; Buur & Jensen, 2004; Winslow, 2007;,) including: Benin (United States Department of State, 2002), Burundi (Winslow, 2007), Cameroon (Mbori & Tebug 2007), Ghana (Statesmen, 2007, Ghananian Times 2007), Kenya (Winslow, 2007), and Nigeria (Winslow, 2007).

Mob violence has been documented against males and females perceived as practicing witchcraft in Burundi (Winslow, 2007), Democratic Republic of Congo (Dynes, 2000), Kenya, (BBC 2000, Winslow 2007), South Africa (Duflou, Lamont, & Knobel, 1988; Scholtz, Phillips & Knobel, 1997; SAPA, 2006; SAPA, 2007), Tanzania (Neki et al., 1986; Ng'walali and Kitinya, 2006; Outwater et al., 2007), and Uganda (Mugunga, 2005).

Although it was not possible from these data to reliably differentiate between spontaneous and vigilantism in every case, the existing data supports that most mob killings in DSM were a result of spontaneous citizen action. However it is possible to conjecture for example, that the epileptic woman who was killed as a witch by a mob in her home back yard, was the victim of premeditated action.

The proportion of all homicides due to mob violence is unusual. The victims of mob violence are demographically similar to the primary perpetrators and victims of collective violence, in that they are unemployed males between the ages of 15 and 29, with low levels of education. It is noted that people with demographics such as these are more susceptible to voluntary and forced recruitment into both armed groups and organized crime (Muggah, in Kobusingye et al., 2008). For these reasons alone it is important to address the issue of unemployed young adult males that is highlighted by the many deaths caused by mob violence.

Since mob violence is directed at habitual thieves usually caught stealing, an important challenge is that simply decreasing the number of deaths due to mob violence, would probably result in an increase in petty crime, further diminishing the quality of life of the community as a whole. Victimization rates in much of Africa are already very high (Naude et al., 2006). Measures to decrease deaths from mob violence, must therefore, simultaneously address the reason that the victim risked his life. Further research is needed on ways to increase employment for this segment of the population and/or increase legitimate police response to crime.

Gangs

Gangs and mobs have similarities in that they are groups of people, but they have different etiologies and aims. The goal of gangs is economic gain through illegal activity. The goal of mobs is to protect the status quo and personal gain is not the primary motive. These data can ascertain little about gangs in Tanzania. It was possible to learn that most deaths occur through groups (see Table 4.13), including homicides by mobs and robbers. How durable the DSM groups are is not known.

There is little research on gangs in Africa with the exception of South Africa. It is estimated in South Africa that 90,000 young adults, are members of youth gangs (Cerda, in Krug et al., 2002). Street gangs are a common feature in urban centers in South Africa. Mokwena (1991) describes the emergence of street gangs in Johannesburg: (a) at the end of the 19th century as a result of the marginalisation and impoverishment of migrant workers, (b) in the 1950s following the establishment of urban townships and (c) during the height of apartheid from 1960 to 1980. In the Western Cape these circumstances took the form of 'growing youth unemployment, an education crisis, social breakdown and the consequent collapse of civic culture' (Matzopoulos, in Kobusingye et al., 2008).

Carl S. Taylor (1990), based on his research in Detroit in the 1980's, described three types of gangs, categorized by their motivational categories: scavenger gangs, territorial gangs, and corporate gangs. Scavenger gangs are described as 'the least organized and least "successful" gangs. Members are likely to be low-achievers and drop-outs, with short attention spans and erratic behavior. Members of the scavenger gangs ' survive off the environment, by means of criminal activities' (Taylor, 1990, p.8). Leadership changes often – even daily. Because scavenger gangs have no pre-planned

goals, crimes are spontaneous. 'They become isolated from mainstream society (Taylor, 1990, p.5).' This description fits what is known about many of those in DSM who were killed by mob violence.

In Detroit it was found that scavenger gangs, bonded together as misfits, and if successful evolved into territorial gangs. Territorial gangs were described as highly organized defenders and controllers of "turf" often for economic purposes [such as for drug business]). No evidence of territorial gangs was seen at the mortuary in DSM.

Scavenger / territorial gangs can evolve in Detroit into corporate gangs which are motivated by monetary profit. Discipline, seriousness, and a strict code of behavior are expected of every member, and punishment for mistakes can be extreme. While members of corporate gangs may not be well educated, they are often highly intelligent. Leaders must be capable of strategic planning, personnel management, and money management. In DSM, is possible that car thieves are part of corporate gangs and could account for the deaths of up to 11 drivers who were killed for their vehicles.

Adult Females

The sample of 17 femicides was too small for in depth quantitative or qualitative analysis. The crude female homicide rate was 1.7/100,000. Standardized to the world population, the rate was 2.65 which is low compared to the world average of 3.69/100,000 (see Table 4.19 and Figure 4.6). It is not known exactly why the femicide rate is so low. 2005 may have been an unrepresentative year. Even so, the evidence suggests that woman are not at high risk of homicide death in DSM and may be demonstrating the strong cultural imperative for the protection of women and children by men in Tanzania (personal communication, Prof. E.F. Lyamuya).

Traditional roles for women in TZ include household and child rearing duties, and farming. Petty business is also a traditional role for women in TZ. Women in fact were never coded as unemployed; if they had no job or business the relatives designated their occupation as homemaker. In these data there were no proxies for socioeconomic status for women. However it has been found that female headed households are not less well off than male headed households (NBS, 2002) which may be reflective of the fact that more girls attend primary school than boys (UNDP, 2005).

In DSM 29.4% of femicides were killed by intimate partners. Only two studies on the phenomenon of intimate partner femicide have been published for Africa. Women in Law and Development in Africa (WILDAF) undertook a study on femicide in Southern Africa (Watts, Osam, & Win, 2001). This study reviewed cases from Botswana, South Africa, Swaziland, Zambia, and Zimbabwe over a 10 year period, using qualitative and quantitative data sources (police, court, newspaper, and oral accounts) varying between what was available in the different countries. The study found that most perpetrators were current or previous intimate partners with most cases being linked to previous partner violence.

The only national prevalence study on intimate femicide was conducted in South Africa (Mathews et al., 2004). This study found that 50% of all murdered women were killed by an intimate partner (see Table 4.16). This intimate femicide rate of 8.8/100 000 (females aged 14 years and older) is the highest globally reported rate (Mathews et al., 2004). The 5 intimate partner femicides in DSM 2005 offer a rate of 0.535/100,000 (among females 15 years and older) for a DSM: South Africa ratio of 0.06. Mathews et al. (2004) found that women killed by an intimate partner were more likely to be killed in

their home. In DSM it was found that 47% of all women were killed in their own homes including 3 of 5 intimate partner homicides. In South Africa it was found that blunt force and legal firearms were the most common weapons and that the ownership of a legal firearm by the perpetrator was strongly associated with intimate partner homicides. In Tanzania patterns were unclear due to the small sample size, except that no intimate partner homicides were killed with a gun. In South Africa it was found that victims were younger than their partners, which could not be determined in TZ with the available data.

In Australia, it was found that 61% of the killings of adult female occurred in an intimate relational context. "Domestic altercations involving desertion, termination of a relationship, or jealousy were found to provide the motives for the deaths of approximately 40 per cent of the femicide victims (Mouzos, 1999, p.2)". In Hong Kong women were most often victims of "family homicide, especially spousal/lover homicides" (Broadhurst, 1999, p. 7). In the US when hand searches of homicide records were conducted, it was found that approximately 40-50% of women in urban settings were killed by intimate partners (Campbell et al., 2003). In addition, this multisite case control study found that "strongest sociodemographic risk factor for intimate partner femicide was the abuser's lack of employment (Campbell et al. 2003, p.1090)". Thus, Tanzania's proportion of femicides that are intimate partners appears to be lower than those of other countries, especially the lower income nations, although more years of data are needed in order to form more definitive conclusions.

Violence against women

Homicide is often used as an indicator of overall violence. The low rate of homicide does not seem to correlate with the moderate levels of violence against women

measured by the WHO Multicountry Study on Women's Health and Domestic Violence against Women (Garcia Moreno, Jansen, Ellsberg, Heise, & Watts, 2005). This important study examined non-partner and intimate partner violence in 15 locations in ten countries. The respondents in TZ were 3259 women aged 15 – 49 years (1,816 were in DSM and 1,443 in Mbeya [provincial Tanzania]). Of the 15 locations, respondents at 7 sites reported more current violence (including Mbeya) than DSM and 7 had less. The definition of physical violence included being slapped or having something thrown at her, pushed or shoved, punched, kicked, choked, threatened with a weapon or had one used against her. Severe physical violence included being punched, kicked, dragged, choked, beaten up or threatened with a weapon. The definition of sexual violence was having been physically forced to have sexual intercourse, had sexual intercourse because she was afraid of what her partner might do or been forced to do something sexual she found degrading or humiliating. More than half of the women had experienced physical or sexual violence as an adult (49.9% in DSM and 60.2% in Mbeya).

Women in DSM and Mbeya reported non-partner violence since the age of 15 years: 26.7% and 22.1% respectively. These 803 women reported violence perpetrated by family members (30.4%), acquaintances which included teachers, boyfriends, or someone at work (69.6%), and strangers (4.3%). More than half of all women who reported physical abuse by non-partners mentioned their teachers as perpetrators. Sexual abuse was reported by 11.5% – usually by boyfriends and strangers.

In almost all 15 study settings of the WHO multi-country study the majority of violence against women had been perpetrated by their intimate partner, rather than other persons (Garcia Moreno, Jansen, Ellsberg, Heise, & Watts, 2005). Most violence against

in women in TZ was perpetrated by intimate partners. Within the previous 12 months, 21.5% and 29.1% of women in DSM and Mbeya respectively, experienced intimate partner violence. In DSM, 41.3% of ever-partnered women reported that they had ever experienced physical and/or sexual violence from an intimate partner; and in Mbeya 55.9% had experienced such violence.

For ever-partnered women 14.8% in DSM and 18.7% in Mbeya had experienced physical violence in the past year. About half of the physical violence experienced by ever-partnered women by their intimate partners exceeded a slap, a push or having something thrown at them (Garcia Moreno et al., 2005a, p.30). In DSM and Mbeya, compared to women who had experienced violence, women who had not experienced violence were less likely to agree that a man had a good reason to hit his wife if she did not complete housework, disobeyed her husband, refused sex, or asked about other women. An unusually high proportion of women in TZ stayed with their partners who had used violence against them, because they forgave them.

A full 25% of the respondents in DSM and 9% in Mbeya had more than primary school education. Since about 5% of females attend secondary school, the sample was more educated than one of average Tanzanian women. Lower educational level was associated with increased risk of violence in many countries including Tanzania which may explain the overall higher rates of violence found in Mbeya where fewer women were educated. That non-partner violence was higher in DSM may reflect that a larger portion of the sample had more than primary school education than in Mbeya, and teachers are primary perpetrators of non-partner violence. But overall, the non-fatal violence reported by women in DSM was average compared to the other sites.

HIV positive women had more sexual violence in their relationship, a large mean number of physically violent partners in their lifetime, and a larger number of physically violent episodes than HIV-negative women (Maman, Mbwambo, Hogan, Kilonzo, Campbell, Weiss & Sweat, 2002). It was found in this study that 37.6% of women had had at least one physically abusive partner and 16.3% had one or more sexually abusive partners in the last three months. These percentages are higher than those reported for ever-partnered women in the Multi-Country Study: 14.8 and 12.8 for physical and sexual violence in the last year (Garcia Moreno et al., 2005, p.28). The differences may be due inherent to populations in that 29.8% of Counseling and Testing Clinic sample (Maman et al., 2002) were HIV-positive (which is much higher than adult female prevalence rates in Tanzanian urban areas (12%) [NBS, 2005]) and violence was found to be positively associated with HIV status. "Kupigana is the term that comes closest to the meaning of physical violence. Informants described it as an argument that crossed the threshold into physical violence." (Maman et al.,2002, p.1332) Not addressed in the study is that "*kupiga*" (which is not the word that was reported and **is** the word used for victims of mob violence) means to beat, while "*kupigana*" (through the verb ending meaning"each other") means "to hit each other" or "to fight". Kupigana implies a mutuality in the violence.

Complex interactions among violence, forced sex, and infidelity, were reported in a sample of 60 young lower middle class men and women (16 – 24 years) in DSM (Lary, Maman, Katebalila, McCauley, & Mbwambo, 2004). An author-described limitation to the study was that these youth were recruited at public venues such as sports grounds, bus stops and bars where females under parental supervision would not be socializing. The

data therefore, may not reflect the reality of the majority of females. While some youth felt that violence could not be justified, violence was condoned by many men, and some women under some circumstances. According to men, violence against intimate partners is justified by infidelity, when women lie to their partners, make public things that men consider private, and disagreements about financial matters. Some women felt that infidelity was justification for men's violence towards female partners. In one quote, a young woman was reported as having beaten her husband publically for suspected infidelity to which his reaction was to beat her "very severely" (Lary et al., 2004, p.203). Violence is more justified in long-term intimate relationships as an effort to mold or control behavior; in short-term relationship it was expressed that it was best to simply end the relationship. Violence is therefore sometimes used to communicate a desire for increased commitment (Lary et al., 2004, p.7) and may partially explain the finding in the multi-country study (Garcia Moreno et al., 2005) that young women and unmarried women report more violence in the last year than do married women. .

Non-fatal violence against women in DSM has been shown to be a complex interaction of many aspects including but not limited to infidelity, culture, comparative age and poverty. The rates of non-fatal violence against women have not been shown to be low in comparison to other nations. That the homicide rate of women in 2005 was low compared to other nations, may be indicative that culturally acceptable levels of physical violence (such as being slapped once) have substantively different consequences than severe violence or sexual violence that can lead to death through HIV. It may also indicate that the homicide rate of 2005 was not representative and highlights the importance of continuing data collection over time.

Children

Krug et al. (2002) estimated that the highest homicide rates in the world for children under age 5 years were in Africa, (17.9 per 100,000 for males and 12.7 per 100,000 for females) which is 3.46 times the overall rate in DSM where the rate of homicide for children under 5 was 9.63 per 100,000 for males and 3.68 per 100,000 for females. In South Africa the overall rates per hundred thousand in Cape Town, Durban, Johannesburg, and Tshwane were 3.0, 5.0, 6.9, and 4.7 respectively compared to DSMs 6.7 (see Figure 4.3).

In DSM no child over 7 months was killed by a relative. Of the 24 children less than 15 years old who died of homicide, 19 were first day neonaticides. Neonaticide was not mentioned in the WRVH (Krug et al., 2002). First-day neonaticide has been recorded in many places around the world (Ember and Ember, 1993; Resnick, 1970; Sharma, 2006). It is a poorly understood event for lack of research specific to the issue. Most statistics available for young children use age groupings of "< 1 yr" or "0 -4". The results in DSM show that broad age groupings such as " <1 year" or "0-4 year" mask a high incidence of first-day neonaticide. DSM has a high rate of neonaticide (27.7 per 100,000) but a low rate of homicide incidence for children older than one day to 5 years (0.91 per hundred thousand) and from one day to 15 years (0.54 per 100,000).

That being said, in the United States the homicide rate on the first day of life has been found to be at least ten times greater than during any other time of life (Paulozzi & Sells, 2002). In North Carolina, over 16 years, 31 newborns were known to have been killed or discarded by a parent, for a rate of 2.1 per 100,000 per year (Herman-Giddens, Smith, Mittal, Carlson, & Butts, 2003). Of those killed, 58.8% of the deaths were male,

which was significantly more than females (test statistic: $z=1.99$, $p = .045$). The mother was the perpetrator in all known cases ($n = 29$). As in North Carolina, more males than females were killed (58.8%) but in DSM the lower number (22) resulted in a lack of significance. In DSM it was believed that the mother was the perpetrator in all cases.

First day neonaticide is believed to be fundamentally different from other child homicide. Minturn and Stashak (1982) examining data on 57 societies found that infanticide occurred most often at birth, was most often performed by the mother, and the infants killed were most often twins, weak, deformed, or illegitimate.

Most literature on neonaticide focuses on the perpetrator. In one well-studied area of northern Ghana, of 1118 neonatal deaths between 1995 and 2002, recorded through Verbal Autopsy, 4.9% were attributed to infanticide (Baiden, Hodgson, Adjuik, Adongo, Ayaga & Binka, 2006). Infanticide is reported to be a customary and public practice among some communities in Ghana in that a soothsayer performs rituals within the compound of the suspected spirit child, who is then forced to take a portion of herbs. The practice originates from the belief in the 'spirit child' phenomenon – that some children are born with supernatural powers that could be harmful to the family into which they are born and this could be only be averted by killing such children (Baiden et al., 2006). Four percent of all early neonatal deaths were attributed to infanticide, and 8% of late neonatal deaths were attributable to infanticide.

This does not appear to be the case in Tanzania, where the pattern seems more like that described by Menick (2000) in Senegal. He found that effectively single, mentally sane, women committed first-day neonaticide as a defense against social exclusion through moral rejection. Resnick (1970) in an early review paper of first-day

neonaticide found 37 cases reported in the world literature from 1887-1968. He found that 89% of the mothers of these cases were under age 25 and 81% were not married. Seventeen percent were "psychotic". The main motive behind committing neonaticide was that the child was not desired because of extra-marital paternity, and the stigma of having an illegitimate child.

The ongoing plight of "housegirls" in Dar es Salaam was first brought to public attention by the media in 1990's. Some of the neonaticides found in this study support the media claims. The findings have been corroborated by research in England (Sharma, 2006). In Great Britain, during the Victorian era infanticide was accentuated by "the habit of many employers regarding young unmarried women in service as "fair game". But for the woman, an illegitimate baby meant almost certain loss of employment and public censure (Sharma, 2006)."

In 1959 Adelson reported that in the United States it was "a common occurrence to find dead newborn infants in sewers, alleys, and incinerators in any metropolitan community". This is no longer common in the United States, and Resnick (1970) suggests a decline in first-day neonaticide occurred after (a) abortions were no longer life-threatening following the advent of antibiotics and (b) effective birth control became available. In addition safe alternatives are available for unwed mothers and some public support programs ease financial strictures for young mothers.

Changes in the availability of abortion have been shown to decrease infanticide, while maintaining historical reasons for it. For example, female infanticide has historical roots in China and India (Sekher & Hatti, 2005) and has been attributed as a possible explanation for the present female deficit (George, Rajaratnam & Miller, 1998). In India

in 1998 a Special Fertility and Mortality Survey was undertaken, as part of an ongoing large-scale demographic survey that provides reliable annual estimates of fertility and mortality indicators at the national level and for major states. Sex ratios for second-and third-order births are skewed towards males, and with the advent of ultra sound, the practice of female infanticide has been largely replaced by selective abortion (Jha, Kumar, Vasa, Dhingra, Thiruchelvan & Moineddin, 2006; Sekher & Hatti, 2005). In China as well, in recent years, skewed sex ratios seem to be driven now more by selective abortion, than by infanticide (Zeng, Yu, Gu, Xu, Li & Li, 1992). As described above, the sex ratio for the DSM neonaticides did not suggest any selective disadvantage for female infants.

However, abortion is prohibited in Tanzania except to save a woman's life (PRB, 2006). In practice, abortion can be obtained in at least one private hospital in DSM but the cost would be prohibitive for almost all women. Birth control is also difficult for the poor to obtain. In South Africa where four city rates of homicide deaths to children under five years were low compared to DSM, birth control and abortion are easier to obtain.

Newspaper coverage

At least 42 homicide cases (24.2%) in the first half of 2005 received coverage in at least one newspaper and were an important source of data in thirteen cases, when news reporters personally investigated. Most comprehensive coverage was given in a Swahili language privately owned and the English language government newspaper (see Table 4.1). Newspapers were least effective at reporting the norm, i.e. the un- or marginally-employed, thieves, a person killed by a mob or by bodily force (see Table 4.2). The

interest ratio was highest when the victim was female and/or the perpetrator was a relative (1.27 and 1.5 respectively). Newspaper coverage in DSM highlighted outlier cases, about which the information was sometimes detailed, varying between newspapers. Two cases (a sister who killed her brother and a mother killed by her son), both outlier cases involving women and relatives, received coverage in all newspapers. Only one case (the matricide) was followed over time. Outside Tanzania no coverage was given to DSM homicide cases.

Sorenson, Peterson Manz and Berk (1998), examining coverage of the Los Angeles Times of 9442 homicide deaths in Los Angeles during 1990 - 1994, found that 13.1% of homicide victims were reported. Most of the covered homicides (72.4%) received multiple stories. Coverage of male and female victims was 11.4% and 23.9% respectively. They found that newspaper presentation of homicide did not necessarily reflect actual patterns of homicide and homicide risk.

A study examining the three national dailies in English and Wales for the period 1993-1997 found that homicide reporting was "distorted" (Peelo, Francis, Soothill, Pearson & Ackerley, 2002). Newspapers had a narrow focus on exceptional and dramatic cases. The circumstance of the killing played a crucial role in whether a homicide was reported, with sexual homicides and motiveless acts, and a female victim were more likely to be reported (Peelo et al., 2002). In the United States as well, homicide coverage is a significant and constant aspect of total news coverage, that "distorts or misrepresents crime" though focusing on non-representative crimes (Paulsen, 2002). "Statistically deviant incident characteristics (female, young, and multiple incidents) are more likely to be covered by the media than homicide incidents involving statistically normal incident

characteristics (i.e. male, minority and single victim incidents)." (Paulsen, 2002). These findings about the coverage of crime are consistent across historical time periods, political boundaries, and city size (Paulsen, 2002).

Some newspapers however, report comprehensively and impressively, and serve as examples of what can be done. In Baltimore's weekly *City Paper*, Anna Ditkoff brings every Baltimore murder victim to light equally in her column "Murder.Ink". The Los Angeles Times, perhaps as a response to the research mentioned above, now has an excellent ongoing interactive blog (http://latimesblogs.latimes.com/homicidereport/) based on county coroner data and *Times* research. It includes an interactive list of variables of victim demographics and incident characteristics of every victim, including multiple photos and an active chat room. Following the Ecological Model this website serves as a link between family and friends of the deceased, the larger community of Los Angeles, and to the world beyond (including to this researcher). It can be imagined that the decreasing homicide trend in Los Angeles, is being aided by (a) the complex and multiple interactions engendered by the web site, and (b) the increased knowledge created and disseminated.

Almost one quarter of DSM homicides received newspaper coverage. However as has been reported elsewhere, the coverage was biased against the statistical norm, with most reporting coverage of the most uncommon events. Newspapers have been shown to have a larger impact on public perception of violent crime than any other news source (Wright & Ross, 1997) and yet they do not usually reflect the actual patterns of homicide. In Tanzania, non-representative data may lead the public to believe that femicides and neonaticides are more common, and that the killing of young men by mobs is less

COLLEGE LIBRARY
MUHIMBILI UNIVERSITY

common than the reality revealed at the Mortuary. However as has been shown by the Los Angeles Times, a partnership with community can be developed to enhance understanding of homicide and influence interventions to reduce homicide rates.

An important component of such a project in Tanzania will be that increased coverage is in the national language, Swahili. This will enable the discussion to be accessible to those most involved.

Limitations

External Validity

Sample Selection

Because it was necessary to rely on proxy respondents, little information was gathered on the 84 (24%) victims who died of homicide and were buried as Unknowns. Of those, police data provided: place of injury, cause of injury and weapon used. Year of birth was estimated by the mortuary manager or the police. Their place of residence, and occupation were usually not known. Likewise little qualitative data could be gathered.

Because of the study's one year time frame, it was not possible to gather a sample size of females or children sufficiently large for detailed quantitative or qualitative analysis.

It is not known how many first day neonaticides were undiscovered. Also some cases may have been misdiagnosed, e.g. counted as neonaticides but in fact not viable.

Content validity

Instrumentation

The "occupation" variable was difficult to operationalize – partly because the next of kin would describe the deceased as having an unknown occupation when probably

more often, the deceased had been unemployed. Content analysis of the qualitative data revealed that 90% of those quantitatively coded as "insufficient data" were qualitatively described by their next of kin or the police as a "thief". A person was coded as a thief only when he was described as such (and the respondent's report was assumed to be true), and not coded as unemployed or as Unknown. Thus, the quantitative data would have been far less complete by itself without augmentation with the qualitative data.

Protective factors including family, education and training, religious institutions, and a criminal justice system, were not adequately addressed.

Generalizability

The results of this survey are not generalizable to other places in Tanzania. DSM is representative of TZ in that it is believed that members of all of TZ tribes live there, but it is atypical in important ways: (a) the male: female population ratio is unusually skewed in DSM towards males, who are at higher risk for homicide death, (b) the unemployment rate, another risk factor for violence, is higher in DSM than in other regions and (c) DSM is the most heterogeneous and fastest growing urban area in the country, and our data show that violence is highly correlated with urbanization. National rates should not be extrapolated directly from these data.

Recommendations

A. The survey initiated in 2005 should be continued and expanded into an ongoing surveillance system. Although some countries with guidance from WHO, have initiated morbidity and mortality surveillance and collaborative research, greater effort

needs to be applied to describe the extent of the problem, to identify and measure risk factors, and to provide the foundation for the ongoing monitoring and evaluation of promising prevention initiatives. If it is not possible in DSM to immediately support a continuous active surveillance system, passive surveillance should be implemented by enhancing extant routine data collection systems

The surveillance system should be thoroughly integrated with the management structure of the City health system. Being embedded in the current organizational structure of health system management put together by the DSM City Council has been shown to be an "excellent vehicle though which to implement urban malaria control." (Caldas de Castro et al., 2004) and could be adapted for injury death (personal communication, Dr. Deo Mtasiwa, Regional Medical Officer, DSM, 2005). The process of integrating the study into the ongoing surveillance system should be documented *in* such a way that "lessons learned" can be evaluated for use in other low-income settings..

B. Developing in-country capacity for surveillance and data analysis to impact on policy and intervention is key to developing effective in-country responses. Underlying all of these requirements is the need for people trained to develop fields of research and implement programmes. Towards that end, it is hoped and believed possible by the PI and colleagues in TZ to integrate surveillance capacity development into the Muhimbili University curriculum.

Newspapers in Tanzania have shown on-going interest in homicide; the coverage patterns have much in common with coverage in Europe and North America. Ongoing interest and willingness to report on violence and homicide in TZ could be partnered with training for more in-depth and broader coverage. Training of journalists and editors could

lead to more representative coverage, as well as produce partners to assist dissemination of surveillance and programmatic results.

C. This exploratory research has opened many important avenues for inquiry. In order to design meaningful interventions, more qualitative and quantitative research is needed to:

- Further describe homicide victims, by interviewing close kin, with variables such as education, socioeconomic status, and levels of interaction with their families and community, and compare them to people with similar demographics who did not get killed. In addition, because unidentified homicides were such a large proportion of all homicides (23.5%), it is important to learn more about who this demographic is.
- Answer programmatically important questions such as: What work can the high risk group of unemployed males do? What work is available?
- Describe the motives of the perpetrators of mob killings in greater depth, in order to be able to design appropriate culturally sound interventions.
- Clarify ways for community participation in creating safety and security within their neighborhoods, that follow the Universal Declaration of Human Rights which includes Article 10 "...full equality in a fair and public hearing by an independent and impartial tribunal..." and Article 11 "Everyone charged with a penal offence has the right to be presumed innocent until proved guilty according to law in a public trial at which he has had all the guarantees necessary for his defense." (United Nations, 1948).

- Compare wards by examining the correlation of high and low levels of violence and prevailing economic, social and environmental factors. Future comparisons should include rural and urban wards with high and low rates of violence. Mbagala with its extreme male: female ratio and Jangwani with its small population and high homicide rate, seem especially important.
- Further describe and evaluate and local cultural, economic and political factors in reference to violent death in nearby regions and countries.

D. Locally designed interventions, need to be supported, implemented, and rigorously documented and evaluated.

The strength of traditional African legal institutions lies at the family and community level where most violence takes place (e.g. Ayittey, 1991; Mugunga, 2005; Rucyahana, 2007). Traditionally, according to Ayittey (1991), the maintenance of peace within most African communities followed four principles: i/settlement of disputes by deliberation and discussion, rather than force, ii/ correction of wrong doing by compensation, rather than punishment, except in serious offenses such as murder, iii/ adjudication and assessment was done by elders who were considered to be impartial and iv/ fairness. Some of these concepts, along with the obvious willingness of people to be involved in community policing, may be useful in developing interventions.

Community policing is being attempted in South Africa in which each police post of the South African Police (SAPS) is coordinating with the community to decrease crime (Pelser, 1999). Key concepts are : service orientation, partnership, problem-solving, empowerment for the creation of joint responsibility, and accountability. The concept has been recently introduced to Liberia.

In TZ, elder's courts, courts of village headmen, and courts of chiefs were forums for dispute settlement. SunguSungu is a fairly well documented community policing phenomenon that first evolved among the Sukuma and Nyamwezi in the 1980's to 'pursue and deal with suspected cattle rustlers and other kinds of rural robbers even beyond the village boundaries' (Bukurura,1995, p.11) and in some place witches (Fleisher, 2000). It seems to have evolved at a time when a gap in the social structure was formed by 'the abolition of chiefdoms and the reorganization of the administrative system and the impact and consequences that this had on local communities, especially with regard to the weakness and inadequacies of state machinery, increase in criminality, and lack of security and protection of lives and property (Bukurura, 1995, p.6)'. Research is needed to learn about its ongoing significance and evolution in different places, and its relationship to mob violence. As suggested by Bukurura "the weaknesses should not overshadow the strengths" and we need to understand "these indigenous communication mechanisms and their potential for long-term use and sustainability (1995, p.12)."

E. Establishing job-creation programs with fair reimbursement especially for chronically unemployed males is urgent. Interventions such as microfinance with accompanied training have been shown to decrease violence against South African women and could perhaps be adapted to young men. The IMAGE Project, a study conducted in rural villages in South Africa's Limpopo Province, focused on women living in poverty (Pronyk et al., 2006). Loans were provided to randomly selected women who were entered into the intervention arm of the study and a participatory learning curriculum training programme were offered at bimonthly loan meetings for a 12-15 month period. The intervention integrated a community mobilisation component

involving both youth and men in the intervention communities. Participants were followed up for 2 to 3 years and showed a 55% reduction in experience of intimate partner violence for those women who were exposed to the intervention.

Microfinance programs usually find that older women are the most successful candidates (personal communication Prof. Charlotte Watts, July 2007). Programs for young men will have to be imaginatively adapted to their circumstances and responsibilities.

F. Because so many of the infanticides were in fact first day neonaticides, efforts to prevent infanticide should focus on the events preceding the child's abandonment. Places of 'Safe surrender' which would allow parents to anonymously transfer unwanted newborns to certain persons, or authorities (Herman-Giddens, 2003; Sharma, 2006) such as religious institutions may be a way of decreasing first-day neonaticides. However the question then quickly arises about how to take care of the infants in a poor country, traditionally opposed to outside adoption as reminiscent of slavery. Easier access to birth control might be helpful. Access to abortion has also been found to decrease first day neonaticides (Jha et al., 2006; Sekher & Hatti, 2005).

Conclusion

The homicide pattern in DSM appears unique in important ways. While the homicide rate is not extremely low as is found in cities such as Hong Kong the overall rate is relatively low compared to many cities around the world (e.g. in the US) and for other comparable cities in low income settings. The rate of femicide is low and the gender gap is wide. The rate of mob violence is high - punishment for petty theft can be extreme. In DSM there is clear need to decrease homicide rates, and also, because of the already

relatively low rates, clear evidence of important lessons yet to be learned around the low firearm violence, low risk for females, high community participation and willingness to maintain order and uphold values. The challenge is to develop coordinated strategies at all levels of the Ecological Model that not only incorporate good public health injury prevention practices, but which also address the underlying human rights and macroeconomic factors.

Table 4.1

DSM, TZ 1 January – 30 June 2005, Media Coverage of Homicide, by Newspaper, Incident Characteristic and Case Number

Newspaper Characteristic	Alasiri [a,d,e]	Mtanzania [a,d,e]	Nipashe [a,d,e]	Uhuru [a,c,e]	Uwazi [a,d, f]	Daily News [b,c,e]
Sex						
Male	32,45, 65(2),74, 422	73,74,76	55,60,73,74, 76,119,143, 169,410,430	74,430	53,74,13 4	74,143, 430, 498
Female	123	123	51,123	123(2)	123	51,71,96, 123(2), 432
Age Group						
Adult	32,45,65 74,123, 422	73,74,76, 123	51,55,60,73,74 76,123,143, 169,410,430	74,123(2), 430	53,74,12 3	71,74,96, 123(2),143, 430,498
Child		134			17,134	17
Perpetrator						
Relative	74,123	74,123	74,123,169	74,123(2)	17,74,12 3	74,123(2),43 2
Sex Assault						
Mob	32,65,422	73	73,430	430	53	143,430
Weapon						
Bodily Force						498
Blunt	32,123	123	123	123(2)	132	123(2)
Sharp	45,74,422	74	74,169	74	53,74	71,74,96

Newspaper Characteristic	Alasiri [a,d,e]	Mtanzania [a,d,e]	Nipashe [a,d,e]	Uhuru [a,c,e]	Uwazi [a,d, f]	Daily News [b,c,e]
Occupation						
Employed	45					71,
Small business	123	123		123	123	123
Unemployed			55			
Thief	65		143,430	430		143,430
Neonate		134			17,134	432
Total Points Covered	26	16	34	18	19	36

Note. There was no coverage of DSM homicide by two other newspapers that were investigated: the *East African* (which focuses on East Africa) and the British *Guardian Weekly* (which focuses globally).

(n) denotes number of stories about the same case, indicating follow-up. Empty cells designate no mention of the associated variable.

[a] Swahili language [b] English language

[b] Government owned [d] Privately owned

[e] Daily [f] Weekly

Table 4.2

DSM, TZ 2005. Newspaper Coverage of Homicide, January-June 2005, Interest Ratio by Incident Characteristics

Characteristics	No. of cases	No. of stories	Cases covered n (%)	Interest ratio Stories : Cases
Male	162	28	18 (11.1)	0.17
Female	11	14	7 (63.6)	1.27
Age				
Child	12	4	3 (25.0)	0.33
Adult	161	36	20 (12.4)	0.22
Perpetrator				
Relative	12	18	7 (58.3)	1.50
Sex assault	1	1	1(100.0)	1.00
Mob	111	10	7 (6.3)	0.09
Weapon				
Abandonment	11	4	4 (36.4)	0.36
Bodily force	39	1	1 (2.6)	0.03
Blunt	31	9	3 (9.7)	0.29
Sharp	43	12	7 (16.3)	0.28
Fire	24	1	1 (4.2)	0.04
Occupation				
Employed	18	2	2 (11.1)	0.11
Small business	28	5	1 (3.6)	0.18
Thief	55	6	3 (5.4)	0.11
Unemployed	97	1	1 (1.0)	0.01
Neonate	11	4	3 (27.3)	0.36
Total	173	156	89(14.45)	0.90

Table 4.3

WHO World Standard Population for Age Standardization of Rates

Table 3. WHO World Standard	
Age group	World Average 2000-2025
0-4	8.86
5-9	8.69
10-14	8.6
15-19	8.47
20-24	8.22
25-29	7.93
30-34	7.61
35-39	7.15
40-44	6.59
45-49	6.04
50-54	5.37
55-59	4.55
60-64	3.72
65-69	2.96
70-74	2.21
75-79	1.52
80-84	0.91
85-89	0.44
90-94	0.15
95-99	0.04
100+	0.005
Total	100

Note. From Ahmad, O. B., Boschi-Pinto, C., Lopez, A. D., Murray, C.J.L., Lozano, R., Inoue, M. *Age Standardization of Rates: a New WHO Standard.* GPE Discussion Paper Series: No.31. EIP/GPE/EBD.World Health Organization. Retrieved 29 October 2007 at http://www.who.int/healthinfo/paper31.

Table 4.4

DSM TZ 2005, Characteristics of Homicide Victims, by Sex

Characteristics	Male n (%)	Female n (%)	Both sexes n (%)	p-value
Population	1,430,718 (50.48)	1,403,511 (49.52)	2,834,229	
Homicide victims	338 (93.4)	24 (6.6)	362 (100)	
Age (years)	CL95%90.2-95.6%	CL95% 4.4-9.8%		
Range	<1-78	<1-62	<1-78	
M (Mdn)	28.4 (27)	24.1(24)	28.1 (27)	0.09[a]
SD	11.4	18.7	12	
Status in DSM				<0.0001[b]
Residents,Tanzanian	327 (96.7)	23(95.8)	350(96.6)	
Non-Tanzania	3 (0.8)	0 (0.0)	3 (0.9)	
Visitors, Tanzanian	7 (2.1)	1 (4.2)	8 (2.2)	
Non-Tanzanian	1 (0.3)	0 (0.0)	1 (0.3)	
Occupation				<0.0001[b]
Farmer	7 (2.1)	2 (8.3)	9 (2.5)	
Self-employ w/ employee	4 (1.2)	0 (0.0)	4 (1.1)	
Self-employ w/oemployee	57 (16.9)	5 (20.8)	62 (17.1)	
Employee	57 (16.9)	4 (16.7)	61 (16.9)	
Housemaker	0 (0.0)	2 (8.3)	2 (0.55)	
Student	4 (1.2)	2 (8.3)	6 (1.65)	
Child <15	17 (5.0)	7 (29.2)	24 (6.6)	
Unemployed	39(11.5)	0 (0.0)	39 (10.8)	
Retired	3 (0.8)	0 (0.0)	3 (0.8)	
Other	78(23.1)	0 (0.0)	78 (21.6)	
Buried by the City	72(21.3)	2 (8.4)	74 (20.4)	

Characteristics	Male n (%)	Female n (%)	Both sexes n (%)	p-value
Weapon used				<0.0001 [b]
Bodily Force	50 (14.8)	2 (8.3)	52 (14.4)	
Asphyxia	25 (7.5)	10 (41.7)	35 (9.7)	
Blunt	86 (25.4)	2 (8.3)	88 (24.3)	
Sharp	80 (23.7)	4 (16.7)	84 (23.2)	
Fire	44 (13.0)	1 (4.2)	45 (12.4)	
Firearm	39 (11.5)	5 (20.8)	44 (12.2)	
Other, Unknown	14 (4.1)	0 (0.0)	14 (3.9)	

[a] t Statistic [b] Chi-square

Table 4.5

DSM, TZ 2005, Number of homicide deaths, Age Stratified Rate per 100,000 by Sex

Males	DSM	Homicide deaths		Rate
Years	population	n	(%)	per 100,000
<1 year	34,604	15	(4.4)	43.35
1-4	130,499	1	(0.3)	0.77
5-9	150,838	1	(0.3)	0.66
10-14	141,587	0	(0.0)	0.00
15-19	147,835	20	(5.9)	13.53
20-29	355,118	158	(46.8)	44.49
30-44	303,349	120	(35.5)	39.56
45-59	114,080	15	(4.4)	13.15
60-69	28,308	5	(1.5)	17.70
70-79	12,347	3	(0.9)	24.30
80+	5,226	0	(0.0)	0.00
All ages	1,423,791	338	(100.0)	23.7

Females Years	DSM population	Homicide deaths n (%)	Rate per 100,000
<1 year	33,988	6 (25.0)	17.65
1-4	128,376	0 (0.0)	0.00
5-9	154663	1 (4.2)	0.65
10-14	152,139	0 (0.0)	0.00
15-19	181,842	0 (0.0)	0.00
20-29	377,593	7 (29.1)	1.85
30-44	246,701	5 (20.8)	2.03
45-59	77,481	4 (16.7)	5.16
60-69	24,098	1 (4.2)	4.15
70-79	13,473	0 (0.0)	0.00
80+	7,999	0 (0.0)	0.00
All ages	1,398,353	24 (100.0)	1.7

Table 4.6

DSM,TZ 2005, Homicide Deaths, Standardized using World Population Standard, by Sex

Years	DSM Population	Deaths actual	World Pop. Standard % [a]	DSM pop. distribution"new"	Deaths adjusted	Rate/100,000 standardized
Male						
0-4	165,103	16	8.86	126,148	12	
5-14	292,425	1	17.29	246,173	1	
15-29	502,953	178	24.62	350,537	124	
30-44	303,348	120	21.35	303,979	120	
45-59	114,080	15	15.96	227,237	30	
60-69	28,308	5	6.68	95,109	17	
70-79	12,347	3	3.73	53,107	13	
80+	5,227	0	1.545	21,998	0	
All ages	1,423,791	338	100.035	1,424,289	317	22.26
Female						
0-4	162,364	6	8.86	123,894	5	
5-14	306,802	1	17.29	241,775	1	
15-29	559,436	7	24.62	344,275	4	
30-44	246,701	5	21.35	298,548	12	
45-59	77,481	4	15.96	223,177	12	
60-69	24,098	1	6.68	93,410	4	
70-79	13,473	0	3.73	52,159	0	
80+	7,999	0	1.545	21,605	0	
All ages	1,398,353	24	100.035	1,398,843	37	2.65

Table 4.7

DSM, TZ 2005, Homicide Rate, by District of Injury

	Inhabitants[a]			Deaths	Per 100,000
District	%	n	%	(CI 95%)	population[b]
Ilala	25.52	109	30.9	(26.2-36.0%)	15.07
Kinondoni	43.6	151	42.8	(37.6-48.1%)	12.22
Temeke	30.88	93	26.3	(21.9-31.3%)	10.62
Total	100.0	353	100		

[a] *Percentage estimates for inhabitants were based on the 2002 Census (Republic of Tanzania, 2003).*

[b] *Population estimates were based on the 2002 Census (Republic of Tanzania, 2003), plus 4.3% per year (the average annual population growth rate from 1988-2002). This is a conservative estimate, since annual population growth is increasing.*

Table 4.8

DSM, TZ 2005, Homicide Death, by District of Injury and District of Residence

	District of Residence			
District of Injury	Ilala	Kinondoni	Temeke	TOTAL
Ilala	77	10	5	92
Kinondoni	7	121	1	129
Temeke	2	2	79	83
TOTAL	86	133	85	304

Table 4.9

DSM, TZ 2005, Wards with More than Ten Deaths

Ward	No. deaths (N=341) n (%)	Population (N=2834229) n (%)	Per 100,00 population
Buguruni	11 (3.0)	67,028 (2.4)	16.4
Jangwani	14 (3.9)	15,722 (0.5)	89.0
Magomeni	13 (3.6)	22,616 (0.8)	57.5
Mbagala	28 (7.7)	70,290 (2.5)	39.8
Mbezi	16 (4.4)	32,641 (1.2)	49.0
Msasani	13 (3.6)	43,457 (1.5)	29.9
Mtoni	11 (3.0)	47,952 (1.7)	22.9
Tabata	28 (7.7)	46,228 (1.6)	60.6
Ubungo	13 (3.6)	44,339 (1.6)	29.3
Ukonga	11 (3.0)	75,014 (2.6)	14.7
Yombo Vituka	10 (2.8)	59,975 (2.2)	16.7
Total	168(46.3)	525,262(18.6)	32.0

Table 4.10

DSM,TZ, 2005. Adult Firearm Deaths, by reason, sex

Adult Firearm Deaths	Males n (%)	Females n (%)	Total n (%)
	39 (90.7)	4(9.3)	43(100.0)
Reason			p = 0.015[a]
Victim of robbery attempt	17 (43.6)	1 (25)	18 (41.8)
Robber/Burglar	6 (15.4)	0 (0)	6 (14.0)
Bystander	3 (7.7)	3 (75)	6 (14.0)
Quarrel	3 (7.7)	0 (0)	3 (7.0)
Sex	0 (0)	0 (0)	0 (0)
Other, unknown	10 (25.6)	0 (0)	10 (23.2)

[a] Fischer's exact

Table 4.11

DSM,TZ 2005, Homicide Deaths by Occupation and Sex

MEN Occupation	2000/01 Population (n=762111) %	2005 Homicides (n) %	p-value 2-sided
Farming/livestock	2.8	(7) 2.20	0.73 [a]
Employee	Subtotal 31.5	Subtotal (52) 16.60	<0.0001[b]
Day laborer		*(19) 6.1*	
Taxi Driver		*(16) 5.1*	
Government	*4.4*	*(2) 0.6*	
Parastatal	*4.6*	(0)	<0.0002 [a]
Guard		*(6) 1.9*	<0.0001 [a]
Political		*(1) 0.3*	
Professionals	*22.5*	*(3) 1.0*	
Other		*(5) 1.6*	<0.0001 [a]
Self-employed w/ employee	9.1	(4) 1.30	<0.0001 [a]
Self-employed w/o employee		Subtotal (57) 18.30	0.053 [b]
Small business	23.6	*(19) 6.1*	
Petty business		*(25) 8.0*	
Skilled labor		*(13) 4.2*	
Unpaid family help in business	8.1	(0)	<0.0001[a]
Housemaker/household chores	0.3	(0)	1.00[a]
Student	10	(4) 1.30	<0.0001[a]
Not active		Subtotal (189) 60.30	<0.0001[b]
Unemployed		*(39)12.4*	
Insufficient data		*(78)24.9*	
Unknowns	14.6	*(72)23.0*	
Total	100.0	(313)100	

WOMEN Occupation	2000/01 Population (n=730815) %	2005 Homicides (n) %	p-value 2-sided
Farming/livestock	3.3	(2) 12.50	0.415[a]
Employee	Subtotal 14.4	Subtotal (4) 25.00	0.273[a]
Government	*3.1*	*(0)*	1.00[a]
Parastatal	*1.7*	*(0)*	1.00[a]
Professionals	-	*(1) 6.25*	
Other	*9.6*	*(3)18.75*	0.194[a]
Self-employed w/ employee	2.8	(0)	1.00[a]
Self-employed w/o employees		Subtotal (5) 31.25	0.043[a]
Small business		*(4 25.0*	
Petty business	12.7	*(1) 6.25*	
Unpaid family help in business	13.0	(0)	0.253[a]
Housemaker/household chores	38.0	(2) 12.50	0.039[a]
Student	7.3	(2) 12.50	0.328[a]
Not active		Subtotal (1) 6.25	1.00[a]
Unknown	8.6	*6.25 (1)*	
Total	100.0	(16)100.0	

Note. Occupation figures from National Bureau of Statistics (2002). *Household Budget Survey 2000/01*. Dar es Salaam, Tanzania.

Italicized numbers and occupations are subtotals.

[a] Fischer's exact [b] X^2

Table 4.12

DSM, TZ 2005. Characteristics of Adult Male Homicide victims, by type of death

Victim Characteristics	Type of Death	Assault n (%) 108 (33.6) 95%CL 29.3-40.1%	Mob n (%) 205 (63.9) 95%CL 59.9-70.8	p-value
Age (years)	Range	15-78	17-50	
	M (Mdn)	34.5 (30)	27.5 (26)	<0.0001[a]
	SD	13.13	5.98	
Occupation				<0.0001[b]
	Farmer	3 (2.8)	4 (2.0)	
	Student	3 (2.8)	1 (0.5)	
	Self-employed w/ employee	4 (3.7)	0 (0.0)	
	Self-employed w/o employee	25 (23.1)	32 (15.6)	
	Employee	39 (36.1)	16 (7.8)	
	Unemployed	10 (9.3)	32 (15.6)	
	Alleged Thief	15 (13.9)	62 (30.2)	
	Unknown	9 (8.3)	58 (28.3)	
Primary weapon				<0.0001[b]
	Bodily Force	13 (12.0)	37 (18.1)	
	Asphyxia	10 (9.3)	0 (0.0)	
	Blunt object	19 (17.6)	65 (31.7)	
	Sharp object	31 (28.7)	49 (23.9)	
	Fire	3 (2.8)	41 (20.0)	
	Gun	29 (26.8)	5 (2.4)	
	Unknown	3 (2.8)	8 (3.9)	

Victim Characteristics	Assault	Mob	p-value
Injury Site			<0.0001[b]
Home	11 (10.2)	0 (0.0)	
Other residential	8 (7.4)	30 (14.6)	

Place of business	36 (33.3)	7 (3.4)
Street /public place	30 (27.8)	154 (75.1)
Farm/countryside	5 (4.6)	12 (5.9)
Unknown	18 (16.7)	2 (1.0)

[a] t-statistic [b] Chi-square

Table 4.13

DSM, TZ 2005, Homicide Incident Characteristics, by Males and Females ≥15 years

Homicide victims	Male n (%)	Female n (%)	Total n (%)	p-value
	321 (95)	17 (5)	338	<0.0001[a]
Incident characteristics				
Type of Homicide				<0.0001
Assault	108 (33.6)	16 (94.1)	124 (36.7)	[a]
Mob violence	205 (63.9)	1 (5.9)	206 (60.9)	
Other	8 (2.5)	0	8 (2.4)	
Perpetrator				<0.0001
Spouse	2 (0.6)	1 (5.9)	3 (0.9)	[a]
Relative,not parent	4 (1.25)	2 (11.8)	6 (1.8)	
Intimate friend	0	4 (23.5)	4 (1.2)	
Acquaintance	25 (7.8)	0	25 (7.4)	
Stranger	4 (1.25)	0	4 (1.2)	
Group of people	258 (80.4)	9 (52.9)	267 (79.0)	
Unknown	28 (8.7)	1 (5.9)	29 (8.5)	

Homicide victims	Males n (%)	Females n (%)	Total n (%)	p-value
Primary weapon				0.0038 [a]
Bodily force	50 (15.6)	2 (11.8)	52 (15.4)	
Asphyxia	11 (3.4)	4 (23.5)	15 (4.4)	
Blunt	86 (26.8)	2 (11.8)	88 (26.0)	
Sharp	80 (24.9)	4 (23.5)	84 (24.9)	
Fire	44 (13.7)	1 (5.9)	45 (13.3)	
Gun	39(12.15)	4 (23.5)	43 (12.7)	
Unknown	11 (3.45)	0	11 (3.3)	
Injury Site				<0.0001
Home	11 (3.4)	8 (4.7)	19 (5.6)	[a]
Other residential	38 (11.8)	1 (5.9)	39 (11.5)	
Place of business	43 (13.4)	3 (17.6)	46 (13.6)	
Street /public place	187(58.3)	1 (5.9)	188 (55.7)	
Farm/countryside	17 (5.3)	2 (11.8)	19 (5.6)	
Unknown	25 (7.8)	2 (11.8)	27 (8.0)	

[a] X^2

Table 4.14

DSM, TZ 2005: Homicide Assault Deaths, Incident Characteristics ≥15 years, by Sex

Assault Deaths Characteristics	Male n (%) 108(87.1)	Female n (%) 16(12.9)	Total n (%) 124 (100.0)	p-value
Age (yrs)				
M (±SD)	34.5 (13.13)	32.7 (12.67)	34.3 (13.04)	0.5984 [a]
Range	17-78	20-62	17-78	
Perpetrator				<0.0001 [b]
Spouse	2 (1.9)	1 (6.25)	3 (3.2)	
Relative,not parent	4 (3.7)	0 (0.0)	4 (3.2)	
Intimate friend	0 (0.0)	4 (25.0)	4 (3.2)	
Acquaintance	24 (22.2)	0 (0.0)	24 (19.4)	
Stranger	4 (3.7)	0 (0.0)	4 (3.2)	
Group:mob+gang	51(47.2)	11(68.7)	62 (50.0)	
Unknown	23(21.3)	0 (0.0)	23 (18.5)	
Primary weapon				0.6431 [b]
Bodily force	13 (12)	2 (12.5)	15 (12.1)	
Asphyxia	10 (9.3)	4 (25.0)	14 (1.1)	
Blunt	19 (17.6)	2 (12.5)	21 (16.9)	
Sharp	31 (28.7)	4 (25.0)	35 (28.2)	
Fire	3 (2.8)	0 (0.0)	3 (2.4)	
Firearm	29 (26.8)	4 (25.0)	33 (26.6)	
Unknown	3 (2.8)	0 (0.0)	3 (2.4)	

Characteristics	Male n (%)	Female n (%)	Total n (%)	p-value
Injury Site				0.0067 [b]
Home	11 (10)	7(43.75)	18 (14.5)	
Other residential	8 (7.4)	1 (6.25)	9 (7.2)	
Place of business	36 (33.3)	3 (19.0)	39 (31.4)	
Street /public place	30 (27.8)	1 (6.25)	31 (25.0)	
Farm/countryside	5 (4.6)	2 (12.5)	7 (5.6)	
Unknown	18 (2.8)	2 (12.5)	20 (16.1)	
Reason				<0.0001 [b]
Argument	28(25.9)	6 (50.0)	34 (27.4)	
Robber, burglar	10 (9.3)	0 (0.0)	10 (8.1)	
Bystander	4 (3.7)	4(25.0)	8 (6.5)	
Victim of robbers	41(38.0)	2 (12.5)	43 (34.7)	
Sexual assault	0 (0.0)	2(12.5)	2 (1.6)	
Other/unknown	25 (23.1)	2 (12.5)	27 (21.8)	

[a] t Statistic [b] X^2

Table 4.15

DSM, TZ 2005, Adult Female Homicide Deaths: Intimate and non-intimate

Characteristics	Type of Death	Intimate n (%) 5 (29.4) 95%CI 10.3-56%	Not Intimate n (%) 12 (70.6) 95%CI 44-89.7%
Age (years)			
	Range	23-35	20-62
	Mean (median)	28.6(30)	35.75(30.5)
	Std. Deviation	4.72	14.74
Primary weapon			
	Bodily Force	1 (20.0)	1 (8.3)
	Asphyxia	0 (0.0)	4 (33.3)
	Blunt	1 (20.0)	1 (8.3)
	Sharp	3 (60.0)	1 (8.3)
	Fire	0 (0.0)	1 (8.3)
	Gun	0 (0.0)	4 (33.3)
Injury Site			
	Home	3 (60.0)	5 (41.7)
	Other residential	1 (20.0)	0 (0.0)
	Place of business	0 (0.0)	3 (25.0)
	Street /public place	1 (20.0)	0 (0.0)
	Farm/countryside	0 (0.0)	2 (16.7)
	Unknown	0 (0.0)	2 (16.7)

Table 4.16

South Africa and TZ, Perpetrator in Female Intimate Homicide Cases

Relationship	South Africa[a] % (n=1349)	Tanzania % (n=5)
Husband (incl. trad. marriage)	18.4 (248)	20 (1)
Cohabiting partner	50.1 (676)	20 (1)
Same Sex Partner	0.6 (8)	0
Dating partner	29.9(403)	40 (2)
Incest perpetrator	0.7 (10)	0
Rejected person proposing love	0.3 (4)	20 (1)

[a] Adapted from Mathews, S., Abrahams, N., Martin, L., Vetten, L., van der Merwe, L., & Jewkes, R. (2004). Every six hours...A national study of female homicide in South Africa. Policy Brief. South Africa: Medical Research Council.

Table 4.17

DSM, TZ, Homicide death rates per 100,000, by age group and sex

Ages	DSM 1992-8[a]		DSM 2005[b]	
	Males	Females	Males	Females
0-4	0	0	9.7	3.7
5-14	2.5	0	0.34	0.33
15-59	26.4	2.6	34.0	1.13
60+	0	23.8	17.46	2.19
All ages**	16.8	2.1	23.49	1.64

[a] From Moshiro, C. Mswia, R., Alberti, K.G.M.M., Whiting, D.R., Unwin, N. & Setel, P.W. for the AMMP Team (2000). The importance of injury as a cause of death in Sub-Saharan Africa: Results of a community-based study in Tanzania. *Public Health, 115,* 96-102.

[b] Standardized to the World Population

Table 4.18

Selected Countries and Cities, Homicide Death, Male:Female Ratios

Country	Region	Author	Years	Homicide(n)	Male:Female
Sub-Saharan Africa		Reza et al.	estimate		6.2
Nigeria	Ife	Nwosu & Odesanmi	1977-1988	202	4.6
	Rivers State	Seleye-Fubara & Etebu	1986-2000	610	6:1
	Benin City	Aligbe et al.	1996-1997	138	4.9
Kenya	Nairobi	Muniu	1986-1990	259	9
Moz'mbique	Maputo	Dgedge et al.	1994	188	8
South Africa		Matzopoulos	2001	~ 28600	6.6
	Soweto	Byarugaba & Kielkowski	1990-1991	1470	9.6
	Cape Town	Duflou	1984	93	14.5
	Cape Town	Duflou et al.	1986	495	8.4
	Cape Town	Lerer	1990	1320	6.7
	Cape Town	Lerer et al.	1994	1789	6.8
	Cape Town	Matzopoulos	2003	2166	8.5
	Durban	Matzopoulos	2003	2071	7.5
	J'burg	Matzopoulos	2003	2024	7.2
	Tshwane	Matzopoulos	2003	548	5.1
Tanzania	DSM	Moshiro et al.	1992-1998	not given	8
	DSM	Outwater et al.	2005	362	14.03
Colombia	Cali	Concha-Eastman et al.	1993-1998	11457	9.2-14.2
Hong Kong		Broadhurst	1989-1997	648	2.3
Australia		Mouzos	1989-1998	3045	1.7
United States		Paulozzi et al.	1981-1998	300,522	6.8
Scotland		Scotland Gov.	2004-2005	137	4

Table 4.19

DSMTZ 2005, Homicide Death Ratios : Global 2002 and Africa 2002, by sex and age

Male	DSM rate per100,000	Global rate[a] per 100,000	Ratio DSM:Global	Africa rate[a] per100,000	Ratio DSM:Africa
0-4	9.69	2.09	4.64	4.34	2.23
5-14	0.34	1.54	0.22	4.15	0.08
15-29	35.39	22.85	1.55	54.42	0.65
30-44	39.56	20.59	1.92	60.72	0.65
45-59	13.15	16.36	0.8	49.45	0.27
60-69	17.7	11.99	1.48	39.27	0.45
70-79	24.3	11.43	2.13	39.38	0.62
80+	0	20.33	0	30.52	0
All ages*	22.26	14.22	1.56	31.99	0.7
Female					
0-4	3.7	1.99	1.86	4.17	0.89
5-14	0.33	1.48	0.22	5.14	0.06
15-29	1.25	3.82	0.33	8.43	0.15
30-44	2.03	4.63	0.44	12.68	0.16
45-59	5.16	4.97	1.04	12.23	0.42
60-69	4.15	5.19	0.8	10.65	0.39
70-79	0	5.67	0	14.11	0
80+	0	4.77	0	31.02	0
All ages*	2.65	3.69	0.72	8.07	0.33

[a] WHO Global Burden of Disease Study for 2002
*Age standardized to the World Standard Population

Table 4.20

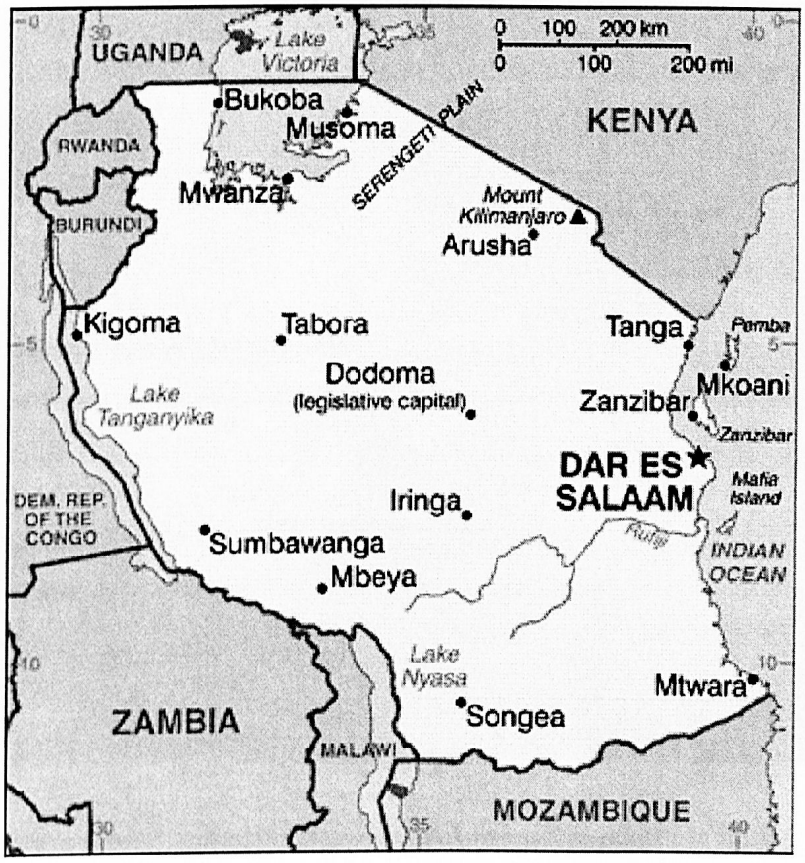
Alleged Reasons for Death Due to Mob Violence in Uganda 2001 and Dar es Salaam, Tanzania 2005

	Male		Female		Total	
Reason	Uganda	DSM, TZ	Uganda	DSM, TZ	Uganda	DSM, TZ
Thievery/robbery	185	157	1	0	186	157
Burglary	20	30	3	0	23	30
Murderer	33	3	0	0	33	3
Witchcraft	5	0	3	1	8	1
Other	38	15	0	0	38	15
Total	281	205	7	1	288	206

Note: Uganda Statistics are from CID Headquarters, November 2002 in International Federation for Human Rights, 2004 reported by Mugunga, E.F. (2005). The population from which the Uganda cases were drawn is not known.

Figure 4.1

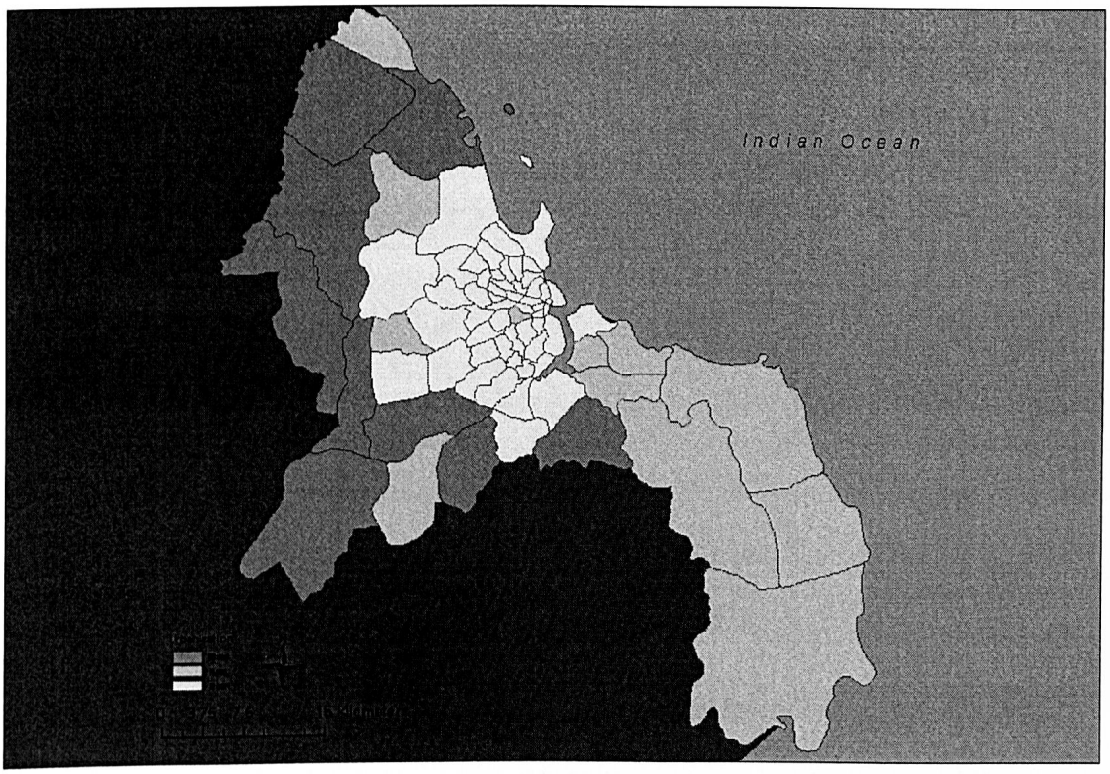
United Republic of Tanzania



Note: Courtesy of www.cia.gov/library/publications/the-world-factbook/reference_maps/africa.html

Figure 4.2

Map of Dar es Salaam, Tanzania, Urbanization by ward



Note. Map created using ArcGIS version 9.2, by Thomas Newcomb.

Figure 4.3

Africa, Selected cities 2005: Homicide deaths per 100,000

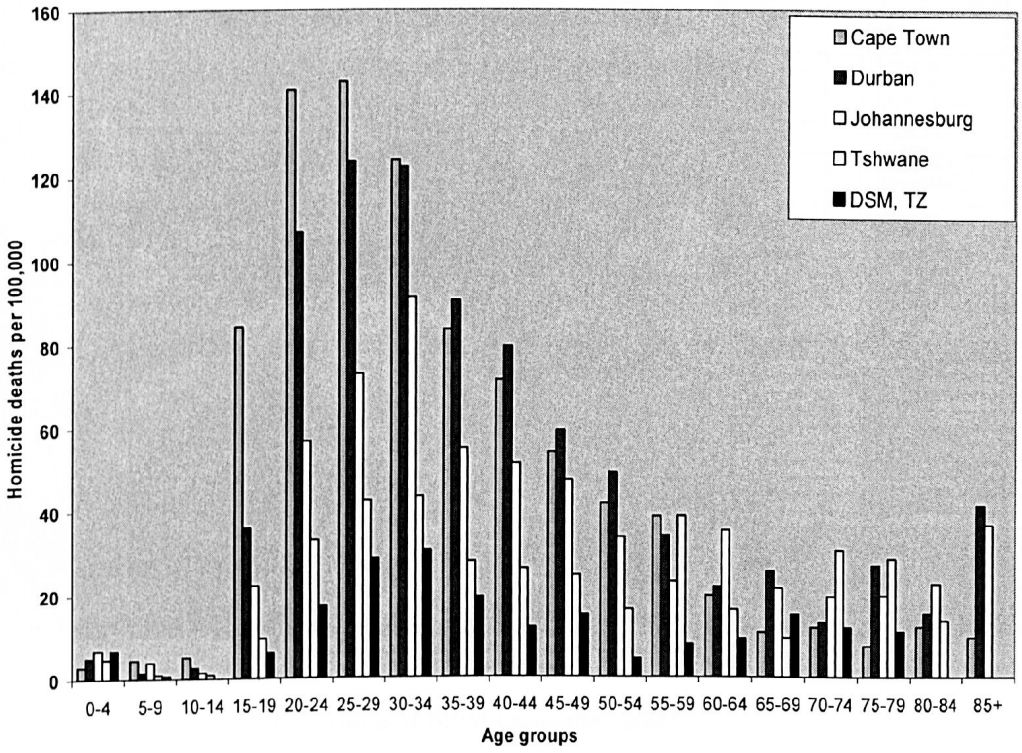
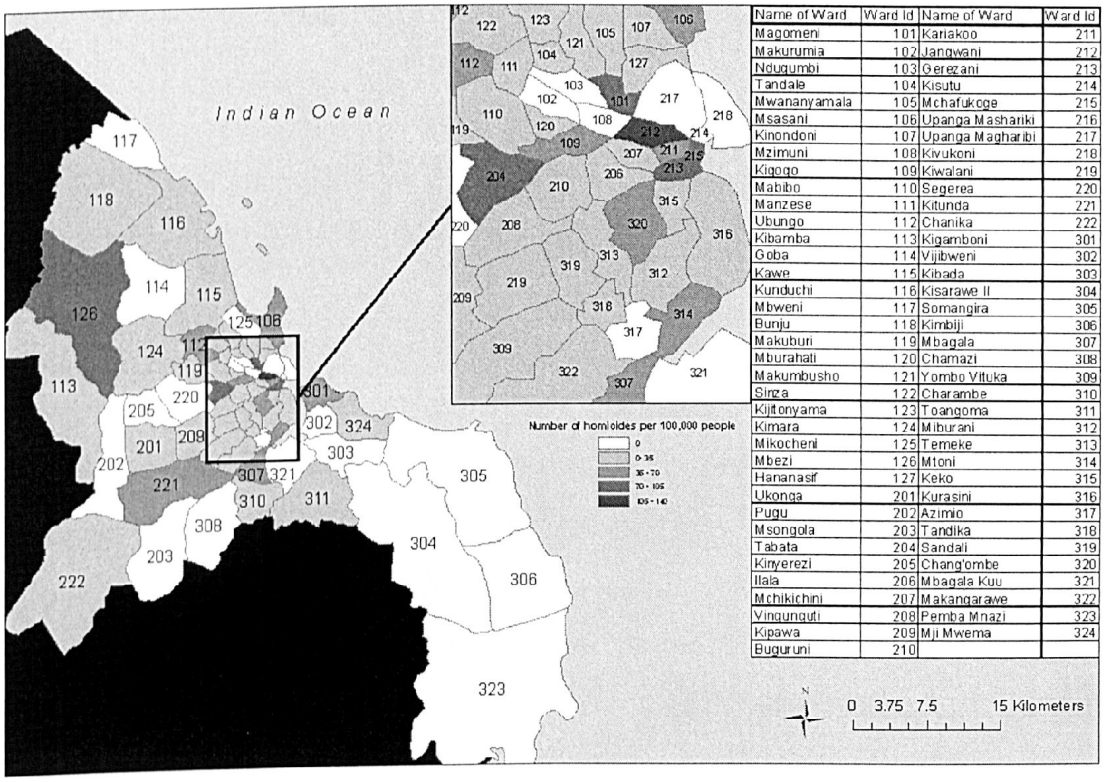


Figure 4.4

Map of DSM, TZ Adult Male Homicide deaths per 100,000 by ward



Name of Ward	Ward Id	Name of Ward	Ward Id
Magomeni	101	Kariakoo	211
Makurumla	102	Jangwani	212
Ndugumbi	103	Geregani	213
Tandale	104	Kisutu	214
Mwananyamala	105	Mchafukoge	215
Msasani	106	Upanga Mashariki	216
Kinondoni	107	Upanga Magharibi	217
Mzimuni	108	Kivukoni	218
Kigogo	109	Kiwalani	219
Mabibo	110	Segerea	220
Manzese	111	Kitunda	221
Ubungo	112	Chanika	222
Kibamba	113	Kigamboni	301
Goba	114	Vijibweni	302
Kawe	115	Kibada	303
Kunduchi	116	Kisarawe II	304
Mbweni	117	Somangira	305
Bunju	118	Kimbiji	306
Makuburi	119	Mbagala	307
Mburahati	120	Chamazi	308
Makumbusho	121	Yombo Vituka	309
Sinza	122	Charambe	310
Kijitonyama	123	Toangoma	311
Kimara	124	Miburani	312
Mikocheni	125	Temeke	313
Mbezi	126	Mtoni	314
Hananasif	127	Keko	315
Ukonga	201	Kurasini	316
Pugu	202	Azimio	317
Msongola	203	Tandika	318
Tabata	204	Sandali	319
Kinyerezi	205	Chang'ombe	320
Ilala	206	Mbagala Kuu	321
Mchikichini	207	Makangarawe	322
Vingunguti	208	Pemba Mnazi	323
Kipawa	209	Mji Mwema	324
Buguruni	210		

Note. Map by Thomas Newcomb and Anne Outwater, 2007

COLLEGE LIBRARY
MUHIMBILI UNIVERSITY
COLLEGE OF HEALTH SIENCIES

Figure 4.5

DSM, TZ, 2005: Firearm Deaths (N=43), by Reason

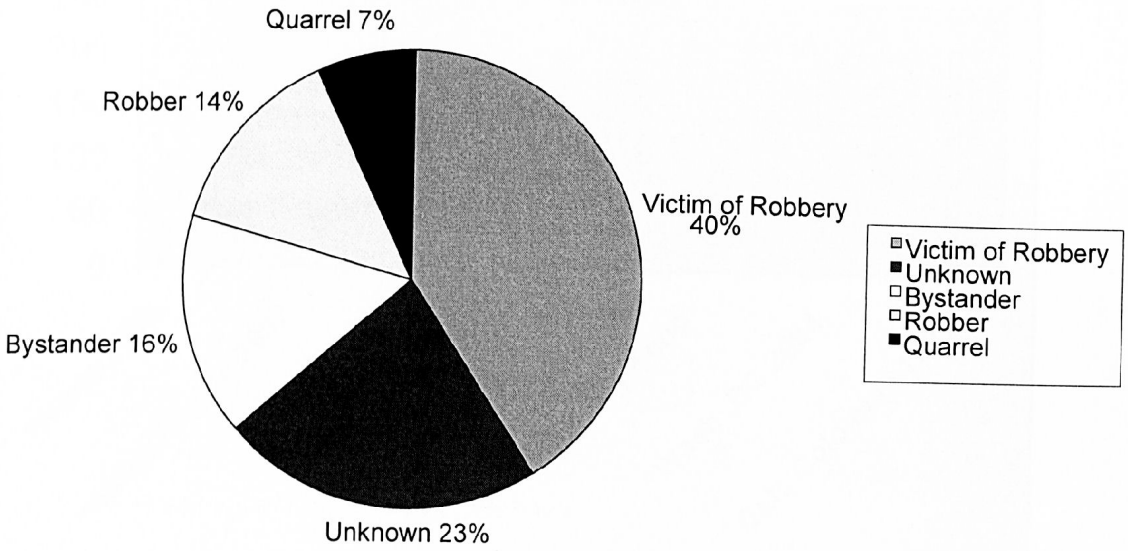
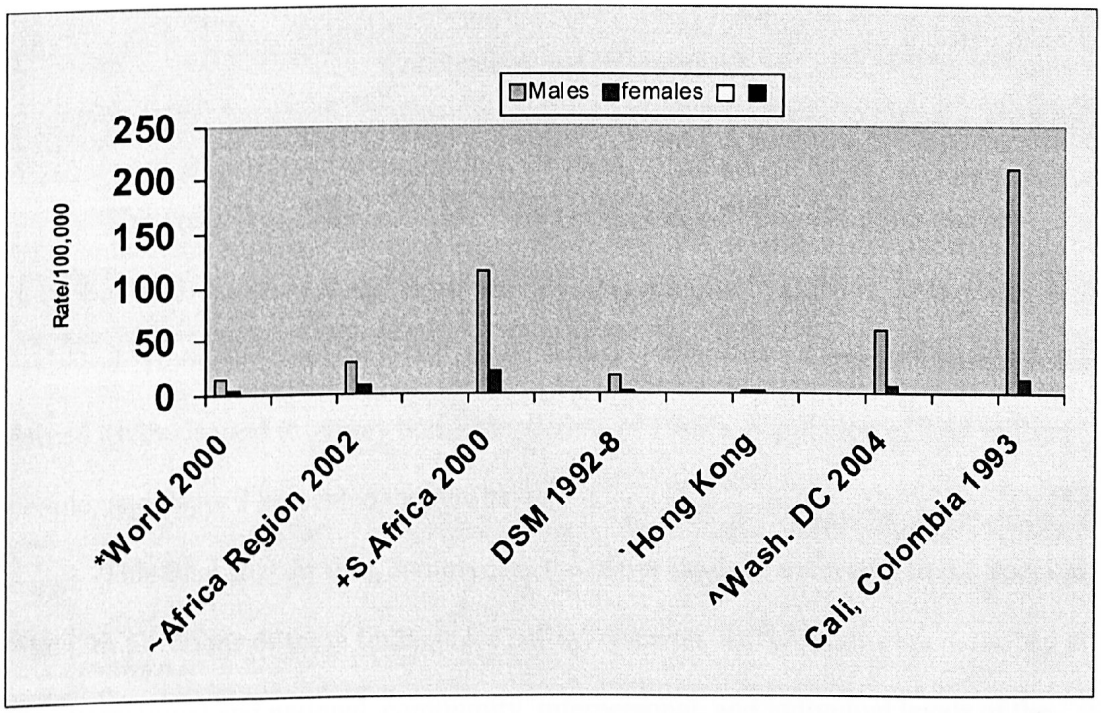


Figure 4.6

Selected World Regions and Cities: Homicide Death /100,000 by sex



* Krug, E.G., Dahlberg, L.L., Mercy, J.A, Zwi, A.B. & Lozano, R.(Eds) (2002). World report on violence and health. Geneva: World Health Organization.

~ Global Burden of Disease Report (2002). WHO Health statistics and health information systems. Retrieved July 2007 from http://www.who.int/healthinfo/bodgbd2002revised

+ Norman, R., Matzoploulos, R., Groenewald, P.& Bradshaw, D. (in press). The high burden of injuries in South Africa. Bulletin of the World Health Organization.

` Broadhurst, R. (n.d.) Homicide in Hong Kong: The Homicide Monitoring Data Base [1989-1997]. University of Hong Kong. Retrieved 12 January 2008 @ http://www.crime.hku.hk/rb-homicide.htm

^ Centers for Disease Control (CDC) Wonder, 2004. Retrieved July 2007 from www.cdc.gov/ncipc/wisqars .

Concha-Eastman, A., Espitia, V.E., Espinosa, R. & Guerrero, R. (2002). La epidemiologia de los homicidios en Cali 1993-1998: seis anos de un modelo poblacional. Rev. Panam Salud Publica/ Pan-America Journal of Public Health 12(4) :230-239).

CHAPTER 5

Conclusions and Implications

This study was designed to (a) ascertain the rate of homicide death and (b) describe the circumstances and those who died of homicide in DSM in 2005. Paper 1, reviewed "Homicide death in Sub-Saharan Africa: 1970-2004"; Paper 2, focused on the Mixed Methods used to survey homicide victims of DSMs population of 2.84 million people; and Paper 3 presented the results.

This final chapter first, summarizes the major findings according to the Specific Aims. Implications of these findings for policy, research, and programs are described at the international and national, community, interpersonal, and individual levels of the Ecological Model. Implications for nursing policy, research, and practice based on nursing science are discussed in the final section.

Specific Aim 1

1/ Identify individual risk factors for homicide death in Dar es Salaam, Tanzania

A. Males *are* at higher risk of violent death than females.

The hypothesis that males are at higher risk of homicide death (crude and age standardized rates of 23.7and 22.26 per 100,000 respectively) than females (crude and age standardized rates of 1.7 and 2.65 per 100,000) in DSM was supported. That more homicide victims are male than female is true in all regions of the world (Krug et al., 2002; Murray & Lopez, 1997).

Many studies, in settings ranging from Scotland (Scottish Government, 2005) to Cali, Colombia (Concha-Eastman, Espitia, Espinosa, & Guerrero, 2002) have shown that while female homicide rates remain relatively steady, male homicide rates can fluctuate dramatically. Because of the cross-sectional design of the present study, we do not know from these data if this is so in DSM. Ng'walali and Kitinya (2006) however discovered that the rate of mob violence (the victims of which are almost exclusively male) varied 66% from one year to the next (from year 2000 to 2005 the number of mob homicides ranged from 198 to 301 per year in DSM).

The ratio of homicide victimization between men and women varies. In Sub-Saharan Africa, males were four to ten times more likely than females to be murdered (Outwater, Campbell, Webster & Mgaya, 2007). In 18 predominantly high income democracies (European, North American, New Zealand, Australia, and Japan) during 1950-1980, the national ratios of male to female homicide deaths ranged from 0.86 in Denmark to 3.49 in the United States. Denmark was the only country with a rate of female victimization exceeding male rates (and even, then very slightly) (Gartner, Baker, & Pampel, 1990).

Gartner et al. (1990) examined these data to gain insight into male: female victimization rates (also called the gender gap). They examined gender differences in roles between men and women, and gender differences in status. They found that "Where women are less embedded in traditional family and reproductive roles, as measured by delayed marriage, divorce, and single motherhood, their risks of being killed are higher, and the gender gap in homicide is less pronounced. Where women are more involved in the paid labour market and where their jobs are less gender-segregated, their

risks of homicide are also higher than expected. However in contexts of greater female status (measured by women's access to higher education), these risks of assuming non-traditional roles disappear and the gender gap in homicide does not converge. (p.608)' The question then arises, of whether or not "the protective advantage in victimization depends on maintaining traditional forms of gender stratification (p.595)."

Since only one year of data were collected from DSM and only 17 women killed, any comment on this question must be tentative. Discussion also is difficult because of the way that Gartner and her colleagues (1990) framed their research. The variables measuring less traditional roles - divorce rate and illegitimate birth rate - even if operationalized carefully may not reflect a more or less 'traditional role' in TZ which has matriarchal tribes and whose idea of 'illegimate' is also different. 'Traditional' roles of women are often misconceptualized as narrower and more controlled than reality on the ground suggests. More research is needed to explore the basic concepts of "status" and "power". It is not at all clear that "higher education" is a true proxy for status in all settings and as has been discussed in extensive literature on the subject of gender, status is a multi-faceted concept. Gartner, drawing on extensive research from all over the world, states "In most societies, the highest rates of violent victimization are suffered by those with low status, little power, and few economic resources. Females' probabilities of being murdered are a notable exception to this pattern...(Gartner et al., 1991, p.593)". It is possible that in Tanzania the highest rates of violent victimization were suffered by those with low status, little power, and few economic resources – unemployed young adult males – and that female probabilities of being murdered were low, since they have

high status and power, in ways that are not well understood and have not been adequately explored by people of Western descent.

It is obvious that the extreme difference in the male: female homicide victimization ratio (14.1) found in DSM was unusual. A gender gap as high as DSM's has only been recorded before in cities with rates of violence five times higher, during times of unusual strife – for instance, in Cape Town, South Africa during the struggle to dismantle apartheid (Duflou, 1986), and Cali, Colombia during an escalating drug war (Concha-Eastman et al., 2002). The highest gender gaps found in Europe were in Serbia, Bulgaria and Italy between World Wars I and II (Gartner et al., 1990).

The DSM male: female *assault-homicide* victimization ratio of 6.35 is far more usual. The difference between the two ratios (all homicide vs. assault homicide), is the sub-group which died from mob violence (which consisted of 57% of all homicides). This sub-group is demographically similar to those at risk of becoming perpetrators and victims of **collective** violence (unemployed males between the ages of 15 and 29, with low levels of education) Kobusingye et al., 2008). For TZ to maintain its historical low levels of war and civil disturbance it is important to target this group for intervention.

B. Young adults (ages 15-34) are at higher risk of violent death than other age groups.

Risk of violent death increased abruptly at age 17 years. Two thirds of homicide deaths (66.85%) in DSM occurred to those in the 20 - 34 year age group, which, as described in Outwater, Campbell, Mgaya, Kinabo et al., (Results paper), fits into an overall world-wide pattern of increased risk at the onset of physical adulthood. The age of homicide death in DSM peaked later than has been found in United States (US) and European cities. Titterington & Grundies (2007) for example found that age at maximum

rate of death from 1985-1994 was 19.8 years in Baden-Wurttemberg, Germany and 18.6 years in Houston Texas.

In African cities, some variability was shown, in that Cape Town and Durban homicide deaths peaked in a younger age group than in Johannesburg, Pretoria/Tshwane, and DSM (see Figure 4). Firearm accessibility is much higher in South Africa and accounts for more than 50% of homicide deaths, in contrast to Tanzania where firearms are not as accessible and account for 12.4% of homicide deaths. South Africans are still suffering from the aftershocks of the fight to end apartheid. These reasons would partially account for the differences between Tanzania and South Africa (and indeed, also with the US), but it is unclear why differences exist between the South African cities.

Specific Aim 2

2/ Identify the geographic areas and locations of risk (residence, place of occurrence) for homicides within Dar es Salaam (DSM).

Specific Aim 2 was accomplished to the ward level. For males, the homicide rate varied from zero in twenty wards, to 138/100,000 in Jangwani (see Map 4). The 22 female homicide deaths occurred in 18 different wards. There are not comparable figures elsewhere in Africa Region. In the US it has been found that homicide rates calculated for large areas conceal substantial differences within (Smith & Zahn, 1999) and that homicide rates vary between cities and areas within those cities (Hawkins, 1999). An important part of this research was learning that rates of homicide death vary in DSM. A next stage of research will be to use these data to explore the areas of high and low risk.

Urbanization

In DSM, urban wards had more homicide deaths than rural wards, and wards with high homicide rates clustered around the urban center. The geographical center of homicide risk in DSM was near the urban center in a busy mixed residential-commercial area. The ward of Jangwani is adjacent to the main city wholesale market and its dirt side streets lead off the main thoroughfares to the Central Market of Kariakoo. Increased homicide risk was also associated with major roads and new settlements under construction. This finding confirms what has been found elsewhere, that homicide risk increases with a city's density. McCall & Nieuwbeerta (2007), for example examining data from 117 European cities showed that the denser the city's urbanism, the higher the homicide rate in that city.

In Africa, urbanization is an important issue since the population living in urban areas steadily increased from 11.2% in 1950 to 35.2% in 2005. The increase is expected to continue so that in 2030, 48.3% will be living in urban centers (United Nations Secretariat, 2006). Rapid growth of urban areas is being fueled by high rates of rural-urban migration as well as population birth rate. Areas around cities that were formally rural, gradually become engulfed by urbanization.

It has been shown in eight villages around Kumasi, Ghana that peri-urban development happens in many ways. There was no simple relationship between variables of "development" (e.g. large enterprises, schools, piped water, electricity, service occupations) and degree of urbanization (Simon, McGregor & Nsiah-Gyabaah, 2004). Social cohesion and levels of community organization were also not easily categorized on a rural-urban gradient. The role of particular village histories, individual elders, committees, and district representatives were 'often crucial, even in the absence of

substantial financial resources among the villagers as a whole'(Simon, McGregor & Nsiah-Gyabaah, 2004). There is variability in responses to urbanization at the community and neighborhood levels that are based on variables that can be manipulated by humans working at the community level. In DSM too, it is expected that there are factors at the neighborhood level such as formal local government structures (Serikali ya Mtaa), SunguSungu type community defense groups, loan associations, religious institutions, businesses and schools which can be harnessed to help prevent the outcomes of urbanization from facilitating violence.

Felton Earls, bringing his experiences from Chicago and Harvard Medical School to Mt. Kilimanjaro, Tanzania has been working with youth within local communities in a randomized health promotion field trial that is due to end in 2007. Earls' previous research, "The Project on Human Development in Chicago Neighborhoods" was an epidemiological project of over 8,000 people in 343 Chicago neighborhoods. Causes and consequences of children's exposure to community and family violence were examined, through physical health status, educational and occupational achievement, and the social relationships of children from birth to adulthood with detailed attention to the social and physical characteristics of the neighborhoods in which they lived and the schools they attended. It was found, for example, that neighborhood characteristics may influence the amount of physical punishment used by families (Molnar, Buka, Brennan, Holton & Earls, 2003). It was found that children growing up in communities rich in 'collective efficacy' – even those who displayed many other 'risk factors', such as poverty or a single parent, fared better than those living without it elsewhere (Sampson, Raudenbush & Earls, 1997). Collective efficacy puts emphasis on neighborhood residents solving

problems such as crime, violence and substance abuse. The most important influence on a neighborhood's crime rate is neighbors' willingness to act, when needed, for one another's benefit, and particularly for the benefit of one another's children. Mob violence could be seen as a manifestation of collective efficacy.

In his work in Tanzania, Earls and his team are training children (aged 10 – 14 years) as change agents to build community AIDS competence (Earls & Carlson, n.d.). His study results will be confounded by the fact that the study locale, the small city of Moshi, in Kilimanjaro Region has had many HIV/AIDS prevention projects in the past 15 years, and the Chagga people who live in that area have a strong sense of tribal identity (the outcome of which is a form "collective efficacy"). However any lessons learned about collective- and self-efficacy may also be useful in DSM and elsewhere in TZ.

Specific Aim 3

3/ Identify the occupations of homicide victims in DSM.

A. Unemployed people are at higher risk of homicide death than those in the formal or informal business sector.

The hypothesis that unemployed men were at higher risk for homicide was supported. Approximately sixty percent of adult male homicide victims in DSM were the unemployed, those identified as thieves, or buried as Unknowns. Although in general, employment was protective, some specific populations of the employed population (such as taxi drivers, guards, and day laborers) were at higher risk than other types of employment. (How much higher cannot be calculated since comparative figures for these specific types of employment are not available.) It had been hypothesized that petty businessmen would be at decreased risk of homicide death based on research by Butchart

et al. (1991) in Soweto, South Africa on non-fatal injuries. In that study, as few trauma patients were occupied in the informal sector (1.57%) as were occupied in formal private enterprise (1.57%). In TZ, 25 (8%) of this sample were petty businessmen (of the informal business sector and coded as self-employed without an employee) which is higher than South Africa (although the relative proportion of petty businessmen in Soweto in 1991 was not stated.) The hypothesis that those occupied in the petty business sector are at less homicide risk than the unemployed was neither accepted nor rejected because the populations cannot be compared exactly with the National Bureau of Standards occupation categorie; the true homicide risk of those in the petty business sector may be masked within the overall category of Self-employed without Employees. Likewise, whilst in Soweto it was found that trauma patients were frequently Unskilled and Semi-skilled laborers, the homicide risk of day laborers (i.e.unskilled and semi-skilled laborers) in DSM may be masked within the overall category of Employee. Hypothesis 1 of Specific Aim 3 is neither accepted nor rejected for females because the sample size was too small.

Similar occupation data on other samples of homicide victims in TZ or Africa are not available. A study that examined homicide rates in117 European Union cities found that unemployment and homicide rates were not consistently correlated (McCall & Nieuwbeerta, 2007). However unemployment in Europe with its strong government financial support for the unemployed is very different than in Tanzania where there are no such social services. In the United States, associations on the homicide-unemployment relationship have been inconsistent. Although Campbell et al., (2003) found unemployment to be the strongest variable for intimate partner homicide, other studies

have found inconclusive results for other forms of homicide (e.g. Sampson, 1985; Reid, Weiss, Adelman & Jaret, 2005 in McCall & Nieuwbeerta, 2007).

There has been limited research in Sub-Saharan Africa to confirm the association between interpersonal violence and poverty seen in Europe and the United States. Poverty creates an environment conducive to violence. Poverty can directly cause violence, as is seen in TZ where most homicides are related to the acquisition or retention of resources. However this association is complex. A study on partner violence in South Africa found that violence was not associated in the expected way with indicators of socioeconomic status including ownership of household goods, male and female occupations, and unemployment (Jewkes, 2002). It was found that women in the poorest households, i.e. those that were mainly supported by someone other than the woman or her partner (43% of all women in the study) were protected from intimate partner violence. Further analysis indicated that this form of extreme poverty reduced the scope for conflicts about household finance. Poverty can also mediate as a protective factor for women if they are less isolated and have better social networks to protect them from violence (Kobusingye et al., 2008). In DSM in this study, the data does not yield a proxy for poverty of women i.e. none of the female homicide victims were coded as unemployed (if not employed outside the house, the families reported that the occupation was home maker). It cannot be ascertained by the data so far analyzed if poverty can be a mediating factor in DSM.

Discussion of DSM homicide rate

DSM's (world population standardized) homicide rate of 12.95 per 100,000 was about 50% higher (Comparative Mortality Ratio 1.47) than the global rate of 8.8 per

100,000. For males, DSM's Comparative Mortality Ratios of World, Africa Region and South Africa were respectively 1.56, 0.7 and 0.19. Assuming that less homicide is a marker for more peace, it could be said that DSM is less peaceful compared to the world, but more so than what is estimated for Africa or measured in South Africa. For females the DSM : Global, Africa and South Africa Comparative Mortality Ratios were respectively 0.72, 0.33, and 0.13, meaning that females in DSM have comparatively low risk of homicide death.

The findings of this study are best compared to other cities rather than other nations. Likewise the city rate cannot be directly extrapolated to all of TZ. (However, see Appendix 1 for a range of estimates and Appendix Table for comparison with other countries.) Important risk factors found in DSM (which are summarized below), differ from the more rural regions which make up most of the country). The overall homicide rate for TZ is probably lower than that found in DSM.

The homicide rate found in DSM is related to multiple factors at all levels of the Ecological Model. Factors that have increased the homicide risk in DSM include (a) the relative youth of the population (compared to the World Standard population, (b) the preponderance of males, (c) individuals willing to defend the community, and in DSM in particular, (d) urbanization with (e) increasing income disparities (as described by the Gini coefficient) , (f) lack of employment, (g) lack of natural resources in the city and (h) accompanying stealing for daily subsistence.

Factors that may have decreased the homicide risk are (a) a visionary, non-mercenary first president dedicated to the common good, (b) a history of social policies that have emphasized unification of the country through a common language, (c) a

history of economic policies which have led to relatively low income disparities, (d) natural resources, (e) little war or civil strife, (f) few guns, (g) a culture of protecting women and children, (h) individuals willing to act on behalf of the community, and (i) two on-going interventions in DSM and Mbeya for street children. These factors need to be supported and are discussed further below.

The impact of the political leadership of Julius K. Nyerere who built social policies deliberately designed to minimize ethnic, tribal, religious, and regional differences while fostering a sense of national unity, and supported the development of a national language (Swahili) is well described in Aminzade's important paper" The *Politics of Race and Nation: Citizenship and Africanization in Tanganyika"* (1998) and in Sutherland, & Meyer (2000). Tanzania has followed economic policies that "strived towards equality" (Paavola, 2003) and the Gini-coefficient reflects that this effort has been quite successful especially when compared to other low and middle income countries.

Findings on the association between homicide and income disparities within countries show that high levels of inequality coincide with high homicide rates (Butchart & Engstrom, 2002, p.797). In fact, a positive association between economic inequality and homicide rates is one of the most consistent findings in the cross-national homicide literature (LaFree, 1999). In the United States the effect of income inequality, even after being adjusted for poverty, correlated with many health indicators including homicide mortality ($p<0.001$) (Kennedy, Kawachi, & Prothrow-Stith, 1996).

The most commonly used measure of inequality is the Gini co-efficient. United Nations Development Program (UNDP, 2002) and National Bureau of Statistics (NBS,

2002) estimates differ, but are not necessarily contradictory. NBS calculated that between 1988 and 2002 it rose from .30 – .36 and UNDP states that the Gini-coefficient decreased from .382 in 1993 when the economy was opened to free-market forces, to .346 in 2005.) Tanzania's most recent Gini co-efficient is .346 – equal to that of the Poland – making the country relatively equalitarian among the countries of "low human development" (UNDP, 2006). Tanzania's richest decile earns 9 times more than the poorest decile (similar to countries such as Ireland, Canada, and Benin) which places Tanzania about 50% higher than the figures of the most egalitarian countries (such as Denmark's Gini coefficient of .247, Japan's of .248 and Sweden's .25). As a comparison, countries with high Gini-coefficients include Brazil (.607) and Chile (.566), where the income share of the wealthiest decile of the population is 50%. Tanzania's efforts towards equalitarianism within the country, may be one reason that the homicide rate is relatively low.

TZ has natural resources that include gold, gas, timber, wildlife, fish, and gem stones. The timber, wildlife and fish supported the population and served as a buffer for the people living in what was otherwise a "low income country". While Nyerere was president the gold and gas deposits were not opened, but conserved as a resource for the future when the population was educated to manage them. Because of this TZ has not been subjected to the violence surrounding extractable resources that is so vivid in other African countries (including notably but not limited to Sudan, Democratic Republic of the Congo, Angola, Sierra Leone and Nigeria). Of note, is that since the mid-1990's all of those resources have been subject to large scale extraction. That this has been done peacefully is noteworthy. However, further research is needed to evaluate what the

benefits of this ongoing extraction are and who benefits. Is an important buffer being used up? - Or is it being managed constructively? Increasingly scarce natural resources could lead to increased privation and increased violence as was seen in the DSM population during times of water scarcity.

The relatively lower rates of homicide in TZ may be partially due to a history without warfare. Research has linked a history of collective violence with persisting high rates of violence on the interpersonal level e.g. in cities in South Africa and Colombia (Noronha, Machado, Tapparelli, Cordeiro, Laranjeira. & Santos, 1999; Norman et al., 2007). Though violence is most acute during armed conflict, the end of war does not necessarily signal significant improvements in population health or security. The introduction of a ceasefire, peace agreement or even primary and curative health care initiatives does not guarantee tangible improvements in the wellbeing of civilians (Muggah, in Kobusingye et al. 2008). In fact, many so-called 'post-conflict' environments in recent years yielded even more direct and indirect threats to civilians than the 'armed conflicts' that preceded them (Muggah, in Kobusingye et al. 2008). (Note: High rates of homicide following civil strife have been documented to taper off over time as is being found in South Africa and can do so quickly as was found in Mozambique [Kobusingye et al., 2008]). A side effect of not having been at war is that guns are not easily available.

When colleagues in TZ were asked why the homicide rate for women was low, they explained that "Men in Tanzania are trained to protect women and children." (personal communication L. Kinabo, E. Lyamuya, E. Mgaya, E.A.M. Tarimo, 2006). Personally I have felt safe in Tanzania if I act kindly to people. This research has showed

that individuals within the community were willing to self-police and will act definitively to protect the community. This is a double-edged sword in that one result is hundreds of male youth dead from mob violence.

Finally, an intervention in DSM called the Dogodogo Center run by a Maryknoll Sister(http://sisters.maryknoll.org) may be impacting on the homicide rate. Street children in DSM can stay at this city center shelter until they are 18. Their daily needs are met including food, water, clothing, a place to stay, counseling, education and efforts to find them employment. About 80 youth live there, protected from the extreme rigors of street life (which would certainly include petty thievery) while gaining skills until they are old enough to work. The protective factors described above should be supported, and explored further for the lessons within them.

Implications of the Findings

Homicide accounts for less than 1% of all deaths in DSM. However homicide is an indicator that highlights aspects of a society needing attention. The findings have policy, research and program implications at all levels of the Ecological Model. Each will be delineated in turn at each level in the sections below.

International and national levels

Policy

In Africa it is clear that efforts to decrease violence have begun. Many governments have responded to the World Health Assembly A56.24 (supporting the recommendations of the World Report on Violence and Health (Krug et al., 2002)) by ratifying treaties and policies thought to impact rates of violence. Changes in legislation have shown the commitment of governments to reduce levels of violence (Brown,

Butchart, Harvey, Bartolomeos, Meddings, & Sminkey, 2007). While governments have an overall mandate for shaping responsible citizenry (Mutto, 2007), it is agreed that broad integrated strategies are required to deal with the complexities of interpersonal violence.

The biggest rise in inequality in TZ was found in urban areas, especially in DSM (NBS, 2002) which may help explain the association between urbanization and high homicide rates. And, the relatively equalitarian distribution of income does not eliminate the effects of low level of income. Over half of the population lives below the national poverty line and 20% of the population lives with less than PPP (worldwide Purchasing Power Parity) of $1/day (Paavola, 2003). The importance of macro-factors is inherent to the WHO emphasis on primary prevention measures such as poverty alleviation, health care, education, and employment.

Finally, these data are important, in that they show that no tourists died from homicide in DSM during 2005; only 1% of homicide victims were non-nationals. They add weight to the idea that TZ, where tourism is an important source of foreign exchange, is a safe tourist destination, as far as homicide is concerned.

Research

The latest Global Burden of Disease (GBD) estimates for sub-Saharan Africa are based on a regional model that uses vital registration data from South Africa (Mathers, Stein, Fat, Rao, Inoue, Tomijima, 2002). A recent comparison of cause specific mortality rates from 10 demographic surveillance sites in Africa Region shows very different patterns between sites even in relatively close proximity (Adjuik et al., 2006). Caution against extrapolation of South African epidemiological data to superficially similar sites elsewhere in Sub-Saharan Africa with different environments, ecologies, and histories

has been urged (Adjuik et al., 2006), highlighting the importance of multiple and varied surveillance sites.

Given the importance of multiple surveillance sites, the importance of "indigenizing" health research systems by building capacity has been stressed (Baiden, Hodgson & Binka, 2006; Gielen & Sleet, 2003). The question arises: where is the next generation of research scientists in low-income countries going to be trained? (Baiden, Hodgson & Binka, 2006, Butchart et al, 2004). Commitment to training people to do this job should be made at the governmental level.

Programs

In-country capacity building is occurring as part of the injury surveillance efforts that have recently started in several African countries. An Injury Surveillance Network with members in different countries is being organized. The development of such information systems is an important step in monitoring trends and developing accurate and appropriate intervention programs.

Because DSM's homicide pattern is different in many ways than what is found in high-income countries, transferring injury prevention strategies from other settings may not be appropriate. It is important to develop and evaluate strategies using local determinants emerging from the cultural, social and economic realities. The importance of meaningful development opportunities including education, training, health care, and employment for individuals, families, and communities is key (Butchart, 2004).

Media coverage patterns have much in common with coverage in Europe and North America. Journalist training could enhance meaningful coverage and produce partners in information dissemination.

Community level

With so much violence perpetrated by citizens committed to protecting the community, it is especially important to identify strategies at this level.

Policy

The strength of traditional African legal institutions lies at the family and community level (Ayittey, 1991). Indigenous African legal institutions and philosophies, that in most African countries were ignored, abolished or disregarded by colonial justice systems, are being described and gaining increased attention (e.g. Ayittey, 1991; Bukurura 1995; Haegert, 2000; Rucyahana, 2007; Mugunga, 2005). Traditionally, according to Ayittey (1991), the maintenance of peace within most African communities followed four principles: (a) deliberation and discussion, (b) correction of wrong doing by compensation, (c) impartiality, and (d) fairness. These principles were upheld by the use of courts, constitutions, and the right to appeal (Ayittey, 1991). A shift from punitive to restorative justice which gives more room to the expectations of the victim and "*mutatis mutandis* which is often the practice in the local communities" (Sita in Naude et al., 2006, p.3) has been suggested.

A few interventions to decrease homicide death have been attempted at the city level in low and middle income countries. For example, Jamaica using the Public Health approach from the Ministry of Health, has formed a Violence Prevention Alliance combined with the Ministry of National Security, churches, NGO's, private sector, Ministry of Education, UN agencies, media and music, and the University of the West Indies (Ward, 2006). The first homicide surveillance system in South America was also in a city (Cali, Colombia), designed in response to dramatically increasing homicide rates

(from 23/100,000 inhabitants in 1983 to 124/100,000 in 1994) (MMWR, 1995). Following a multi-disciplinary epidemiological approach, a working group headed by the Mayor with representatives from health institutions, health authorities, forensic departments, academia, Police, and the prosecutor's office, monitored the homicide rates weekly. Interventions directly related to the data were implemented (Concha-Eastman et al., 2002). The homicide rate fell steadily in 1995, 1996 and 1997 to 112, 102 and 86.1/100,000 respectively. When the Mayor's terms were completed, the approach was abandoned, and the homicide rate again began to increase (Guerrero, 2007). The Cali experience showed that city level interventions tied to policy based on surveillance data can be successful in a reducing homicide. Such an approach could be considered in DSM. As a start, the surveillance system should be embedded into the DSM City Council health system.

A multi-pronged community-based approach to health care research seems to have led indirectly to a decrease in infanticide in Ghana. Diverse social and biomedical studies have been undertaken in the Navrongo district in Ghana (including Vitamin A supplementation Trial, Insecticide-treated Bednets Trial, Community health and Family Planning Project). "These and other community-based interventional studies have invariably been accompanied by numerous health education campaigns, the effects of which appear to be diverse. ....Given the fact that no intervention has specifically targeted reduction in neonatal mortality, we believe that the observed decline in neonatal mortality (including infanticide) is a collateral effect of the multiple health research activities undertaken in the district over the years." (Baiden et al., 2006,p.535).

Research

The homicide risk in Africa has been shown to vary greatly between nations, cities, and even wards. Further comparisons of comparable data sets are important. What are the risk and protective factors that occur with increased urbanization? The data in this study revealed little about the role of community level factors such as access to education and training, religious institutions, and a criminal justice system which need to be examined pragmatically.

When setting up pilot surveillance systems, mixed methods research is an important component to building a successful knowledge base upon which to build an ongoing system. A true mixed methods approach would require active surveillance. After the initial phase however, or if there are inadequate monetary resources to support an ongoing active surveillance system, a passive surveillance system, can be embedded into daily practice. Throughout mainland TZ, and in Zanzibar this can be done through the Mortuary Ledger books. This study has shown that the *code* of mob violence should be added to the surveillance system.

Violent death surveillance should be ongoing in DSM. The low femicide rate of 2005 may not have been representative and needs to be validated with longitudinal data. The meaning of the wide gender gap is not yet apparent. DSM's encouragingly low firearm death rate should be monitored.

Two studies in low and middle income countries (Norman et al. 2007; Concha-Eastman et al., 2002) found that while violence is widespread, specific areas are "hot spots", a common finding in high-income countries as well. Future research in DSM into the distinctions between physical, environmental and economic attributes as well as

less easily quantifiable elements of social cohesion, and organization will help elucidate the differences between wards, as well as distinguish "hot spots" within them.

Qualitative research is needed to describe the mob perpetrators and the motives behind using extreme force. Research is needed to explore the possibilities of merging traditional legal institutions and philosophies, with groups such as Sungusungu (Heald, 2006).

Programs

This study demonstrated that the WHO/CDC *Injury Surveillance Guidelines* (Holder Peden, Krug, Lund, Gururaj, & Kobusingye, 2001) were useful and adaptable. Local capacity building for continuing in-country violent death surveillance is underway. It is believed by the PI and her co-investigators in Tanzania, that it is possible to integrate monitoring, and evaluation, including analysis within undergraduate and graduate courses at the Muhimbili University College of Health Sciences. In that way surveillance could continue, while simultaneously developing strong local capacity to monitor violent death trends and evaluate further research.

Geomapping proved useful in describing wards of greatest risk and a relationship with urbanization. It may provide a tool for closer cooperation with the Police and the media. Disseminating research findings into the community is facilitated through the use of easily understood maps.

Taxi drivers are a group at special risk, and practical research is needed to discover ways to increase their safety.

The little understood phenomenon of neonaticide in Tanzania indicates that it is important, to explore, understand and articulate the huge social and economic forces

driving young girls out of their cultural norm and preference (to be in their own home), to serve as house servants to non-relatives with the accompanying dangers. Also however a solution to the problem of unwanted children is needed. Safe surrender for unwanted newborns in mid-16th century Europe, began as a result of so many "dropped babies" – a"newborn left in a public place in the hope that it would be found and cared for" (Sharma 2006, p.153). It is common in Tanzania for families even under financial duress, to accept children that would be considered "illegitimate" in other societies. That these neonates are not being accepted into families indicates that Safe Surrender needs to occur at the community level. Safe surrender, the ability to transfer a neonate to, for example, a hospital, anonymously without penalty, could save up to 19 neonates per year providing they were all transferred. Most African nations do not often allow their children to be adopted by non-nationals, finding it reminiscent of slavery. If the idea of Safe Surrender were to materialize, the futures of the neonates left in such drops must be carefully considered and planned for.

Family/Relational level

These data revealed relatively few homicides perpetrated at the family/ relational level of the Ecological Model.

Research

Families that experienced homicide death should be compared with those who did not. To examine this question, data on 102 case and 217 control families, have been collected. This second questionnaire, a survey containing open- and close-ended questions to learn more about the deceased's relationships with the family and the community, occurred after informed consent was obtained. The 102 case families were

interviewed at the MNH with between 1 June 2005 – 6 January 2006. The 217 control families were randomly selected throughout DSM in February to March 2006. Data entry commences January 2008.

The qualitative data in the study was also expanded with in-depth interviews of families. After answering the second questionnaire as described above, family members who experienced a homicide death were asked if they would be willing to continue with an in-depth tape-recorded interview. Thirty two such interviews of families were conducted during 1 June 2005 – 6 January 2006. All have been transcribed into Swahili, and 28 have been translated. These data will be analyzed using the N'vivo7 program (QSR International).

Individual level

Research

More quantitative data including education, socioeconomic status, religiosity, living conditions are needed for homicide victims. Qualitative data is needed to further describe the victims (especially victim-precipitated homicide deaths), their motives and their milieu. Homicide victims need to be compared to people with similar demographics who did not get killed. These data have been collected as described above.

There appear to be strong correlations between violence and ill health (e.g. Ember & Ember, 1993). Since it was observed at the Mortuary that many of the homicide victims, especially those who died of mob violence, appeared ill and malnourished, testing for HIV, nutritional status and endemic parasites such as malaria, worms, and schistosomiasis would give health data that could have important intervention

implications. (For example, if people are too weak to labor, providing employment opportunities may not be a sufficient first step.)

Programs

The high homicide rate of unemployed young adult males presents a major challenge in finding ways they can contribute to the increased well-being of the whole. Income generation schemes for working age males seem critical but pragmatic questions such as "What work can high risk males do?" and "Why is there not work available for them?" still need to be answered.

Small loans and training schemes being tested by Pronyck et al. (2006) in South Africa, are showing decreased violence against women who start a small business; schemes such as these may be adaptable to young men and need to be urgently tried. Since males are the principle victims and perpetrators of violence, a trial could be tested in DSM giving young men small loans and business skills augmented by communication training, and monitored for changes in their violence against men, women and children.

Strengths and Limitations of this Study

Strengths

- A multi-disciplinary research team represented two Universities (Johns Hopkins and Muhimbili University College of Health Sciences) and Schools of Nursing, Public Health, and Medicine.
- Broad government support and partnership from TZ Ministry of Health, DSM Regional Medical Officer, Tanzania Police, and Department of Statistics at the Bureau of the Census.

- A survey instrument similar to the one used in this study had been piloted in two African countries (South Africa and Uganda) and was considered reliable.
- The mixed methods approach was an extremely useful approach for this exploratory research, even though the qualitative data set was not comprehensive.
- On site data collection allowed for participatory observation which led to increased understanding of (a) homicide in DSM and (b) how to integrate passive surveillance into the daily routine of the Mortuary.
- Many nurses worked on this study including the PI, the PI's advisor and the Mortuary Manager. That the three interviewers were nurses increased chances that study participants were not further traumatized, and may have been comforted during the interviewing process.
- The multi-cultural and multi-lingual research team was important in overcoming biases and assuring reasonable data interpretation.
- The generalizability of the methods used in this study are wide and can be adapted to all mortuaries in TZ and inform surveillance in other low-income countries.
- Data is shared between investigators and with the Police, and is expected to be shared with future students. As well it will be reported to WHO for identifying comparative results with other sites.
- This research is ongoing. A separate room at the newly re-furbished mortuary has been designated for surveillance. Integrating surveillance into the MUCHS curriculum has MUCHS support.

Limitations

- The necessary reliance on proxy respondents meant that little data were gathered on the 84 (24%) homicide victims who were buried as Unknowns.
- Almost all respondents were men. (It is not clear how females would have reported differently.)
- Some instrument variables were unreliable:
    - 'Activity at time of injury' because (a) the coding was more appropriate for injury morbidity than mortality and (b) the person who knew the activity in certainty was dead. This variable was abandoned.
    - 'Residence' and 'Place of Injury' as to Street because repondents described places by using locally familiar descriptions rather than street names which led to data that could not be consolidated.
    - 'Occupation' was difficult to code because many victims are unemployed in the conventional sense, but are occupied in the "street" economy, the dynamics of which are little understood.
- The sample sizes for women and children after one year of surveillance were insufficiently large for significant qualitative or quantitative analysis.

Implications for Nursing Science

The Director of the World Health Organization, M. Chan, has asserted that the health sector offers an evidence-based, prevention-oriented approach to the problem of violence (Brown et al. 2007). Health professionals are key gatekeepers in efforts to monitor, identify, treat, and intervene in cases of interpersonal violence (Mercy, Butchart, Rosenberg, Dahlberg, & Phinney, 2007). Nurses are often the first contact of the

increasing numbers of victims of violence, and so have a particular interest in eliminating violence (International Council of Nurses, 2003). By providing primary evidence to the criminal justice system, building government records, healing and caring for survivors, and tending the bodies of the dead until they are released for burial, the heath sector, often nursing, is the most important link with the police, government, and families of the deceased.

Violence in fact, has been a key element driving nursing practice. For example, one of the first European nursing orders was formed by a militant group of knights in the 12th century; after the First Crusade they became the Knights Hospitallers, formed to care for pilgrims and victims of disasters. Florence Nightingale's life work was driven by her experience caring for those wounded in the Crimea War. Traditionally, nursing has been concerned with interventions to save and heal victims and perpetrators of violence.

However the current extent and severity of violence is beyond our capacity. While nursing can and should participate in approaches such as improving emergency health care in response to trauma, and thus decrease homicide deaths, that alone will not address the larger intertwined issues that lead up to a homicide event. It is now understood that violence impacts all realms of the human being. The long term health effects are not always physically visible and can manifest in poor health status and poor quality of life through generations (e.g. Campbell, Harris & Lee, 1995; Krug et al., 2002; Humphreys, Campbell, & Parker, 2002). In addition many chronic health problems are related to violence (Campbell, Anderson, Fulmer, Girouard, McElmurry & Raff, 1993).

The aim of inquiry in the practice disciplines is to generate knowledge for practice (Sandelowski, 2002). In nursing, professional practice is the driving force for the

development of nursing science (Donaldson, 1995). The research described in this dissertation, for example, was a response to nurses being asked to do the impossible – that is, save victims directly hit by a bomb. From this experience a program of research is being developed in TZ to prevent violence.

Developing such a program of research has been called "one of the most useful trends" in nursing science by AAN Expert Panel on Violence (Campbell et al., 1993, p.88). Nursing programs of research in the United States have been developed with broad policy, treatment, and scientific impacts (Campbell, Harris & Lee, 1995; Little & Kantnor, 2002). It is an approach that has led to important cross-national advances in for example, the understanding of intimate partner violence, relatively quickly. Multiple research philosophies and multiple research methods - qualitative and quantitative - have been drawn from many disciplines depending on the problem being addressed. Linkages between different research projects has been facilitated by a Nursing Research Consortium on Violence and Abuse (Campbell et al., 1993). Useful knowledge that is grounded in the core values, beliefs, and practices of nursing has been generated to address the multi-dimensional needs (physical, emotional, intellectual, and spiritual) of people within their interpersonal relationships, communities and the world. Meeting the imperatives of evidence based nursing practice has led to an expanded role for nurses that includes activities such as establishing health policies at the state, national, and international levels, supporting scholarly interdisciplinary research programs in universities and World Health Organization, as well as caring for victims in diverse settings.

Nursing science provides knowledge to increase the likelihood of success in nursing practice. The research discussed in this dissertation falls within that tradition. A survey, the important first step, was done to define the extent of homicide death in DSM. From that survey, following the logic of the Ecological Model, other facets of the problem are being described. The evidence asserts that answers must come from multiple avenues, and that interventions will also. The Ecological Model urges nurses to think creatively for solutions or aspects of solutions at all levels including the individual, family, community and beyond. It is not surprising that nurses are embracing a multi-cultural global perspective (Lutzen 2000; Leininger & McFarland, 2002; Meleis,1998). The Model supports the idea of interactions in which mutual learning can take place.

Violence is a broad social issue that can only be effectively addressed through partnership with all levels of government, as well as NGOs, community groups, researchers and the public. Interventions to reduce and prevent violence, are most effective integrating responses from other sectors (including but not limited to government, media, arts, business, labor, education, engineering, environment, religion, medicine, criminal justice, and public health) (Prothrow-Stith & Spivak, 2004). Increasingly nurses and other professionals are aware that decreasing violence means increasing the well-being of the community including victims and perpetrators. Good evidence suggests that "traditional development activities in sectors such as economic development, education, employment, governance, social services and urban development have a potent influence on levels of violence (Brown et al. 2007, P. 28)."

As nurses continue to care for victims and perpetrators of violence, our roles will be broadened further, since it is imperative that we advocate for the importance of meaningful development opportunities which include education, training, health care, justice and employment especially for the poorest individuals, families, and communities around the world. Nurses can and should work closely with all sectors to create the conditions in which violence is perceived as unnecessary.

REFERENCES

AAPOR (1999). Best Practices for Survey and Public Opinion Research. Kansas: American Association for Public Opinion Research.

Adjuik, M., Smith, T, Clark, S., Todd, J., Garrib, A., Kinfu, Y., Kahn, K., Mola, M., Ashraf, A., Masanja, H., Adazu, U., Sacarlal, J., Alam, N., Marra, A., Gbangou, A., Mwageni, E., & Binka, F. (2006). Cause specific mortality rates in Sub-Saharan Africa and Bangladesh. *Bulletin of the World Health Organization, 84(3):181-92.*

Ahmad, O. B., Boschi-Pinto, C., Lopez, A. D., Murray, C.J.L., Lozano, R., Inoue, M., Age Standardization of rates: a new WHO Standard. GPE Discussion Paper Series: No.31. EIP/GPE/EBD.World Health Organization. Retrieved 29 October 2007 at http://www.who.int/healthinfo/paper31.pdf.

Allen, J., Als, H., Lewis,J. & Liwack, L.F. (2000).*Without sanctuary: Lynching photography in America.* Santa Fe, New Mexico: Twin Palms.

Aligbe, J.U., Akhiwu, W.O. & Nwosu, S.O. (2002). Prospective study of coroner's autopsies in Benin city, Nigeria. *Medicine Science and Law, 42*, 318-324.

Amakiri, C.M.T. (2000). Forensic medicine in the Rivers State of Nigeria: experience in four rural general hospitals. *Medicine Science and Law, 40,* 71-77.

American Statistical Association (1995). *What Is A Survey?* series ASA: Section on Survey Research Methods.

Aminzade, R (1998). The Politics of Race and Nation: Citizenship and Africanization in Tanganyika. Retrieved 10/9/2003 from http://www.sscnet.ucla.edu/soc/groups/ccsa/aminzade.ntlm.

Ayittey, G.B.N. (1991). Indigenous Legal Institutions. In *Indigenous African Institutions*, Dobbs Ferry, NY: Transnational Publishers.

Baiden, F., Hodgson, A., Adjuik, M., Adongo,P., Ayaga, B & Binka, F. (2006). Trend and causes of neonatal mortality in the Kassena-Nankana district of northern Ghana, 1995-2002. Tropical Medicine and International Health, 11(4), 532-539.

Baiden, F., Hodgson, A., & Binka, F. (2006). Demographic surveillance sites and emerging challenges in international health. *Bulletin of the World Health Organization, 84(*3), 163-165.

Bartolomeos, K. & Peden, M. (2003).WHO-supported Injury Surveillance activities in Afrcia: Mozambique and Ethiopia. *African Safety Promotion: A Journal of injury and violence prevention*; 1(2):34-37.

Bernard, H.R. (2000). Social Research Methods: Qualitative and Quantitative Approaches. Thousand Oaks, London, New Delhi: Sage Publications, Inc.

Blais, A. & Gidengil, E. (1993). Things are not always what they seem: French-English differences and the problem of measurement equivalence. *Canadian Journal of Political Science,* 26, 541-555.

Bowley, D.M.G, Khavandi, A., Boffard, K.D., Macnab, C., Eales, J., Vellema, J., Schoon, H. & Goosen, J. (2002). The malignant epidemic – changing patterns of trauma. *South African Medical Journal, 92*,798-802.

Bradshaw, D., Schneider, M., Dorrington, R., Bourne, D.E. & Laubscher, R. (2002). South African cause-of-death profile in transition—1996 and future trends. *South African Medical Journal, 92,*618-23.

Bradshaw, D., Groenewald, P., Bourne,D.E., Mahomed, H., Nojilana, B., Daniels, J. & Nixon, J. (2006). Making COD statistics useful for public health at local level in the city of Cape Town. *Bulletin of the World Health Organization,* 84(3), 211-217.

Briggs, J., Mwamfupe, D. (2000). Peri-urban Development in an Era of Structural Adjustment in Africa: The City of Dar es Salaam, Tanzania. *Urban Studies;* 37(4):797-809.

British Broadcasting Company [BBC]. (13 October 2000). Is mob justice acceptable? Have your say. *World Service Focus on Africa.* Retrieved April 2007 from http://news.bbc.co.uk/2/hi/talking_point/debates/african_debates/965299.

Broadhurst, R. (n.d.) Homicide in Hong Kong: The Homicide Monitoring Data Base [1989-1997]. University of Hong Kong. Retrieved 12 January 2008 @ http://www.crime.hku.hk/rb-homicide.htm.

Bronfenbrenner, V. (1979). *The ecology of human development: Experiments by nature and design.* Cambridge, MA: Harvard University Press.

Brown, D., Butchart, A., Harvey, A., Bartolomeos, K., Meddings, D. & Sminkey, L. (2007). *Third Milestones of a Global Campaign for Violence Prevention Report 2007.* Geneva: World Health Organization.

Bukurura, S.H. (1995). Indigenous Communication Systems: Lessons and experience from among the Sukuma and Nyamwezi of West-Central Tanzania. *Nordic Journal of Africa Studies, 4(2), 1-16.*

Butchart, A., Brown, D.S.O., Anderson, A., Radebe, B. & Johnson, K. (1991). Non-fatal injuries due to interpersonal violence in Johannesburg-Soweto: Incidence, determinants and consequences. *Forensic Science International, 52,* 35-51.

Butchart, A., Nell, V., Yach, D., Brown, D.S.O., Anderson, A., Radebe, B. & Johnson, K. (1991). Epidemiology of non-fatal injuries due to external causes in Johannesburg-Soweto. *South African Medical Journal, 79*, 472-479.

Butchart, A. & Engstrom, K. (2002). Sex- and age-specific relations between economic development, economic inequality and homicide rates in people aged 0-24 years: a cross-sectional analysis. *Bulletin of the World Health Organization, 80,* 797-805.

Butchart, A., Peden, M., Matzopoulos, R., Phillips, R., Burrows, S., Bhagwandin, N., Saayman, G., Cooper, A. & participating forensic pathologists (2001). The South African national non-natural mortality surveillance system – rationale, pilot results, and evaluation. *South African Medical Journal, 91*, 408-417.

Butchart, A., Phinney, A., Check, P. & Villaveces, A. (2004). *Preventing violence: a guide to implementing the recommendations of the World report on violence and health.* Department of Injuries and violence Prevention, World Health Organization, Geneva.

Buur, L. & Jensen, S. (2004). Vigilantism and the Policing of Everyday Life in South Africa. *African Studies Journal, 63*: 2.

Byarugaba, J. & Kielkowski, D. (1994). Reflections on trauma and violence-related deaths in Soweto, July 1990- June 1991. *South African Medical Journal, 84*, 610-14.

Caldas de Castro, M., Yamagata, Y., Mtasiwa, D, Tanner, M., Utzinger, J., Keiser, J., & Singer, B.H. (2004). Integrated Urban Malaria Control : a case study in Dar es Salaam, Tanzania. *American Journal of Tropical Medicine, 71*(S2): 103-117.

Campbell, J. C. (1981). Misogyny and homicide of women. *Advances in Nursing Science, 3,* 67-85.

Campbell, J.C., Anderson, E., Fulmer, T.L., Girourd, S., McElmurray, B. & Raff, B. (1993). Violence as a nursing priority: Policy implications. *Nursing Outlook. Scholarly Inquiry for Nursing Practice: An International Journal, 9(2): 105-126.*

Campbell, J.C., Harris, M.J. & Lee, R.K. (1995). Violence Research: An overview. *Scholarly Inquiry for Nursing Practice: An International Journal, 9(2): 105 – 126.*

Campbell, J.C., Webster, D, Koziol-McLain, Block, C., Campbell, D., Curry, M. A., Gary, F., Glass, N., McFarlane, J., Sachs, C., Sharps, P., Ulrich, Y., Wilt, S.A., Manganello, J., Schollenberger, Frye, V. & Laughon, K. (2003). Risk Factors for Femicide in Abusive Relationships: Results from a Multisite Case Control Study. *American Journal of Public Health, 93*(7), 1089-1097.

Centers for Disease Control (CDC) Wonder, 2004. Retrieved July 2007 from www.cdc.gov/ncipc/wisqars .

Centers for Disease Control. EpiInfo version 3.3.2 Atlanta: CDC.

Chandramohan, D., Setel, P. & Quigley, M. (2001) Effect of misclassification of causes of death in verbal autopsy: can it be adjusted? *International Journal of Epidemiology, 30*(3), 509-514.

Concha-Eastman, A., Espitia, V.E., Espinosa, R. & Guerrero, R. (2002). La epidemiologia de los homicidios en Cali 1993-1998: seis anos de un modelo poblacional. *Rev. Panam Salud Publica/ Pan-America Journal of Public Health, 12*(4), 230-239).

Conrad, F.G. & Schober, M.R. (2000). Clarifying question meaning in a household telephone survey. *Public Opinion Quarterly*, 64, 1-28.

Cook, P.J. & Moore, M.H. (1999). Guns, gun control, and homicide. In *Homicide: A Sourcebook of Social Research* Eds. Smith, M.D and Zahn, M.A. Thousand Oaks, London, New Delhi: Sage Publications.

Cook, P.J (1987). Robbery violence. *Journal of Criminal Law and Criminology, 78*, 357-376.

Corzine, J., Huff-Corzine,L., & Nelson, C. (1996). Rethinking lynching: Extralegal executions in postbellum Louisiana. *Deviant Behavior, 17*:133-157.

Couper, I. & Walker, A.R. (1997). Causes of death in rural hospital in South Africa. *Central Africa Journal of Medicine, 43,* 219-22. *(Abstract only)*

Creswell, J.W. & Plano Clark, V.L. (2007) *Designing and conducting mixed methods research.* Thousand Oaks, London, New Delhi: Sage.

Crime Information Analysis Centre (2004). *South Africa Police Services Annual Report 2002/2003.* Retrieved July 2004 from http://www.saps.gov.za.

Dgedge, M., Novoa, A., Macassa, G., Sacarlal, J., Black, J., Michaud J. & Cliff, J. (2001). The burden of disease in Maputo city, Mozambique: registered and autopsied deaths in 1994. *Bulletin of the World Health Organization, 79,* 546-552.

Duflou, J.A.L.C. (1986). A study of 93 deaths from gunshot injuries during security force action in the Greater Cape Town area, 1985. *South African Medical Journal, 70,* 88-90.

Duflou, J.A.L.C., Lamont, D.L. & Knobel, D.J. (1988). Homicide in Cape Town, South Africa. *American Journal of Forensic Medical Pathology, 9,* 290-94.

Dynes M. (July 4, 2001). Frenzied mob hacks 300 'witches' to death. *The Times* Retrieved May 2007 from http://hss.fullerton.edu/comparative/africa_articles.

Earls, F. & Carlson, M. (n.d.) Young Adolescents as Agents of Change: Promoting HIV/AIDS Competent Communities in Tanzania. Retrieved from December 2007 at http://www.ccaba.org/resources/Felton%20Earls%20presentation.ppt.

Ember, C.R. & Ember, M. (1995). Issues in Cross-cultural Studies of Interpersonal Violence. *Violence and Victims*, 8(3), 217-233.

Espitia, V., Guerrero, R., Concha, A., Sanchez, C., & Cardenas, V.M. 1995). Patterns of homicide—Cali, Colombia., *Mortality and Morbidity Weekly, 44*(39):734-7.

Espitia- Hardeman, V. & Paulozzi, L. (2005). *Injury Surveillance Training Manual.* Atlanta (GA): Centers for Disease Control and Prevention, National Center for Injury Prevention and Control.

Fleisher ML. (2000*).* Sungusungu: State-sponsored village vigilante groups among the Kuria of Tanzania. *Africa*, 70(2): 209-228.

Flisher, A.J., Joubert, G. & Yach, D. (1992). Mortality from external causes in South African adolescents, 1984-1986. *South African Medical Journal, 81,* 77-80.

Ford-Gilboe, M., Campbell, J. & Berman, H. (1995). Stories and numbers: Coexistence without compromise. Advanced Nursing Science; 18(1):14-26.

Foundation for Human Rights Initiative. (2004). "Uganda: a situation of systematic violations of civil and political rights". Retrieved April 2007 from http://www.fidh.org/IMG/pdf/ouganda380ang.pdf.

Fowler, F.J. & Mangione, T.W. (1990). *Standardized survey interviewing.* Newbury Park, CA: Sage Publications.

García-Moreno, C., Jansen, H. A. F. M., Ellsberg, M., Heise, L., Watts, C. (2005a). *WHO Multi-country Study on Women's Health and Domestic Violence against Women: Initial results on prevalence, health outcomes and women's responses.* Geneva: World Health Organization.

García-Moreno, C., Jansen, H. A. F. M., Ellsberg, M., Heise, L., Watts, C. (2005b). Prevalence of intimate partner violence: findings from the WHO Multi-country Study on Women's Health and Domestic Violence. *The Lancet,* 368, 1260 – 1269.

Garenne, M., Kahn, K., Tollman, S. & Gear, J. (2000). Causes of death in a rural area of South Africa: An international perspective. *Journal of Tropical Pediatrics, 46,*183-190.

Gielen, A. & Sleet, D. (2003). Application of behaviour-change theories and methods to injury prevention. *Epidemiologic Reviews,* 25,65-76.

George, S. Rajaratnam, A., & Miller, B.D. (1998). Female infanticide in rural south India. *Search Bulletin*; 12:18-26.

Ghanaian Times. (27 March 2007) Mob Justice@Kotolabi: 3 robbers beaten by mob. Retrieved on May 2007 from http://www.ghanaweb.com/GhanaHomePage/NewsArchive.

Gilbert, L. (1996). Urban violence and Health – South Africa 1995. Social, Science, & Medicine, 43(5),873-886.

Gordis L (2000). Epidemiology. Philadelphia, London, New York, St. Louis, Sydney, Toronto: W.B. Saunders Co.

Granja, A.C., Zacarias, E., Bergstrom, (2002). Violent deaths: the hidden face of maternal mortality.*British Journal of Obstetrics and Gynecology, 109*,5-8.

Guerrero, R. (2007) Crime observatories and urban policies in Colombian cities. Cambridge, Mass.: Taubman Center for State and Local Government.

Harkness, J., Pennell, B-E., and Schoua-Glusberg, A. (2004) Survey questionnaire translation and assessment. In *Methods for testing and evaluating survey questionnaires.* John Wiley & Sons, Inc.

Harpham, T. & Few, R. (2002). The Dar es Salaam Urban Health Project, Tanzania: a multi-dimensional evaluation. *Journal of Public Health Medicine, 24*(2), 112-119.

Hawkins, D.F. (1999). What can we learn from data disaggregation. In *Homicide: A Sourcebook of Social Research* Eds. Smith, M.D and Zahn, M.A: Thousand Oaks, London, New Delhi: Sage Publications.

Heald, S. (2006). State, law, and vigilantism in northern Tanzania. *African Affairs, 105*(419), 265-283.

Heide, K.M. (1999). Youth Homicide: An integration of psychological, sociological and biological approaches. In *Homicide: A Sourcebook of Social Research* Eds. Smith, M.D and Zahn, M.A. Thousand Oaks, London, New Delhi: Sage Publications.

Heise, L. (1998). Violence against women: an integrated, ecological framework. *Violence against Women 4,* 262-290.

Herman-Giddens, M.E., Smith, J.B., Mittal, M., Carlson, M., Butts, J. D. (2003). Newborns Killed or Left to Die by a Parent: A Population-Based Study. *JAMA,* 289,1425-1429.

Holder, Y., Peden, M., Krug, E., Lund, J., Gururaj, G. & Kobusingye, O. (2001). *Injury Surveillance Guidelines*. Geneva: World Health Organization.

Humphreys, J. Campbell, J.C. & Parker, B. (2002). Intimate partner violence against women. In J. Fitzpatrick. *Annual review of nursing research.* New York : Springer.

International Council of Nurses.(2003). Violence: A world-wide epidemic. *Nursing Matters Fact Sheet.* Retrieved March 14, 2003 from www.icn.ch.

Institute of Medicine (in press). Report of the proceedings of the June 2007 meeting for Global Violence Prevention Advocacy. Washington, D.C.

Jewkes, R. (2002). Intimate partner violence: causes and prevention. *The Lancet*, 359, 1423-1429.

Jha, P., Kumar, R., Vasa, P., Dhingra, N., Thiruchelvan, D., & Moineddin, R. (2006). Low male-to-female sex ration of children born in India: national survey of 1.1 million households. *The Lancet;* 367: 211-218.

Johnson, R.B. & Onwuegbuzie, A.J. (2004). Mixed Methods Research: A Research Paradigm Whose Time Has Come. *Educational Researcher*, 33(7), 14-26.

Kaufman, J.S., Asuzu, M.C., Rotimi, C.N., Johnson, O.O., Owoaje, E.E. & Cooper, R.S. (1997). The absence of adult mortality data for sub-Saharan Africa: A practical solution. *Bulletin of the World Health Organization, 75,* 389-395.

Kennedy, B.P., Kawachi, I., & Prothrow-Stith, D. (1996). Income distribution and mortality: cross-sectional ecological study of the Robin Hood index in the United States. *British Medical Journal, 312,* 1004-1007.

Kibel, S.M., Bradshaw, D. & Joubert, G. (1990). Trends in childhood injury mortality in three South African population groups. *South African Medical Journal, 78,* 392-397.

Kibel, S.M., Joubert, G. & Bradshaw, D. (1990). Injury-related mortality in South African children, 1981-1985. *South African Medical Journal, 78,* 398-403.

Killias, M. (1993). International correlations between gun ownership and rates of homicide and suicide. *Canada Medical Association Journal, 148*(10), 1721-1725.

Klein, M.W. (2005). The value of comparisons in street research. *Journal of Contemporary Criminal Justice, 21*(2), 135-152.

Klauke, D.N., Buehler, J.W., Thacker, S.B., Parrish, R.G., Trowbridge, F.L., Berkelman, R.L. & the Surveillance Coordination Group. (1988). Guidelines for Evaluating Surveillance Systems. *Morbidity and Mortality Weekly Reports, 37*(S-5):1-18.

Knobel, G.J. (1986). Effect of civil unrest on the incidence of violent and non-natural deaths. *South African Medical Journal, 70,* 83-88.

Knobel, G.J., De Jilliers, J.C., Parry, C.D.H. & Botha, J.L. (1984). The causes of non-natural deaths in children over a 15-year period in greater Cape Town. *South African Medical Journal, 66,* 795-800.

Kobusingye, O.C. & Lett, R.R.(2000). Hospital-based trauma registries in Uganda. *The Journal of Trauma: Injury, Infection, and Critical Care, 48,* 498-502.

Kobusingye, O.C. et al. (expected launch 2008). *Report on Violence and Health in Africa.* World Health Organization.

Krug, E.G., Dahlberg, L.L., Mercy, J.A, Zwi, A.B. & Lozano, R.(Eds) (2002). *World report on violence and health.* Geneva: World Health Organization.

LaFree, G. (1991). A summary and review of cross-national comparative studies of homicide. In *Homicide: A Sourcebook of Social Research* Eds. Smith, M.D and Zahn, M.A. Thousand Oaks, London, New Delhi: Sage Publications.

Lary, H., Maman, S., Katebalila, M., McCauley, A. & Mbwambo, J. (2004). Exploring the Association between HIV and Violence: Young People's Experiences with Infidelity, violence and forced sex in Dar es Salaam, Tanzania". *International Family Planning Perspectives, 30*(4), 200-206.

Le Billon, P. (2001). The political ecology of war: natural resources and armed conflicts. *Political Geography, 20*, 561-584.

Leader, T., Mullen, B. & Abrams,D. (2007). Without mercy: The immediate impact of group size on lynch mob atrocity. *Personality and Social Psychology Bulletin; 33*(10):1340-1352.

Leggett, T., Louw, A., Schonteich, M. & Sekonyane, M. (2003). *Criminal Justice in Review.* ISS Monograph Series, no. 88. Pretoria: Institute for Security Studies.

Leininger, M. & McFarland, M.R. (2002) *Transcultural Nursing: Concepts, theories, research and practice.* McGraw-Hill.

Lemke, S., Vorster, H.H., Jansen van Rensburg, N.S., & Ziche, J. (2003). Empower women, social networks and the contribution of qualitative research: broadening our understanding of underlying causes for food and nutrition insecurity. *Public Health Nutrition, 6*, 759-764.

Leovy, J. (ongoing). The Homicide Report: LA Country Homicide victims Chronicle. Retrieved November 2007 from http://latimesblogs.latimes.com/homicidereport/.

Lerer, L.B.(1992). Women, homicide and alcohol in Cape Town, South Africa. *Forensic Science International, 55,* 93-99.

Lerer, L.B.(1994). Homicide-associated burning in Cape Town, South Africa. The *American Journal of Forensic Medical Pathology, 15, 344-347.*

Lerer,L. B., Matzopoulos, R.G. & Phillips, R. (1997). Violence and injury mortality in the Cape Town metropole. *South African Medical Journal, 87,* 298-301.

Little, L. & Kantor, G.K. (2002). Using ecological theory to understand intimate partner violence and child maltreatment. *Journal of Community Health Nursing, 19,* 133-145.

London, J., Mock, C., Abantanga, F.A., Quansah, R.E. & Boateng, K.A. (2002). Using mortuary statistics in the development of an injury surveillance system in Ghana. *Bulletin of the World Health Organization, 80,* 357-364.

Lutzen, K. (2002). A global perspective on domestic and international tensions in knowledge development. *Journal of Nursing Scholarship, 32*(4), 335-337.

Maman, S. Mbwambo, J.K., Hogan, N.M., Kilonzo, G.P. , Campbell, J.C., Weiss, E. & Sweat, M.D. (2002). HIV-Positive Women Report more Lifetime Partner Violence: Findings from a Voluntary Counseling and Testing Clinic in Dar es Salaam, Tanzania. *American Journal of Public Health*, 92(8), 1331 – 1337.

Mathers, C.D., Vos, T., Lopez, A.D., Solomon, J., Ezzati, M. (ed.) (2001). *National Burden of Disease Studies: A practical guide.* Edition 2.0 Global Program on Evidence for Health Policy. Geneva: World Health Organization. Retrieved on October 2007 from www.who.int/healthinfo/nationalburdenofdiseasemanual.pdf .

Mathers, C.D., Ma Fat, D., Inoue, M., Rao, C., Lopez, A.D. (2005).Counting the dead and what they died from: an assessment of the global status of cause of death data. *Bulletin of the World Health Organization, 83*,171–177.

Mathews, S., Abrahams, N., Martin, L., Vetten, L., van der Merwe, L., & Jewkes, R. (2004). *Every six hours...A national study of female homicide in South Africa.* Policy Brief. South Africa: Medical Research Council.

Mathews, S., Abrahams, N., Jewkes, R., Martin, L., Lombard, C., Vetten, L., (in press). Intimate Femicide-Suicide in South Africa. *World Health Bulletin.*

Matzopoulos, R.(in press). Gangs. In Kobusingye et al. (Eds.) *Africa Report on Violence and Health.* Geneva: World Health Organization.

Matzopoulos, R., Bowman, B., Seedat, M., & Sukhai, A. (2005).Introduction: The National Injury Mortality Surveillance System. In R. Matzopoulos (Ed.). *A Profile of Fatal Injuries in South Africa. Fifth Annual Report 2003.* Parow: Medical Research Council.

Maxwell, J.A. (1996). *Qualitative research design: An interactive approach.* Thousand Oaks, London, New Delhi: Sage Publications.

Mba, C. (in press). Elder Abuse. In Kobusingye et al. (Eds.) *Africa Report on Violence and Health.* Geneva: World Health Organization.

Mbori, L. & Tebug, O.E. Mob justice leaves one dead, several injured. *The Cameroon Post.* Retrieved May 2007 from http://www.postnewsline.com/2007/03/mob_justice_lea.html.

McCall, P.L. & Nieuwbeerta, P. (2007). Structural covariates of homicide rates: A European city cross-national comparative analysis. *Homicide Studies: An Interdisciplinary & International Journal*, *11*(3), 167-188.

Medical Research Council (2002). *Guidelines on ethics for medical research.* South Africa: Medical Research Council.

Meleis A. I. (1998). A passion for making a difference : ReVisions for empowerment. *Scholarly Inquiry for Nursing Practice: An International Journal*, *12*(1), 87-94.

Menick, D.M. (2000). Les contours psychociaux de l'infanticide en Afrique noire: le cas du Senegal. *Child Abuse Neglect, 24,* 1557-1565.

Mercy, J.A & Hammond, W. R. (1999). Combining action and analysis to prevent homicide. In *Homicide: A Sourcebook of Social Research* Eds. Smith, M.D and Zahn, M.A. Thousand Oaks, London, New Delhi: Sage Publications.

Mesner, S.F. & Rosenfeld, R. (1999). Social structure and homicide: Theory and Research. In *Homicide: A Sourcebook of Social Research* Eds. Smith, M.D and Zahn, M.A. Thousand Oaks, London, New Delhi: Sage Publications.

Mgaya, E., Kazaura, M., Outwater, A., & Kinabo, L. (in press). Suicide in Dar es Salaam Region, Tanzania 2005. *Journal of Forensic Medicine*.

Ministry of Health, Tanzania (2004). *Burden of Disease Profile 2001.* National Sentinel System/Local Council/AMMP-Supported Demographic Surveillance: Dar es Salaam. Accessed at http://www.ncl.ac.uk/ammp/site_files/ public_html/finrep/.

Ministry of Health. Tanzania (2004). *The policy implications of Tanzania's mortality burden: a ten-year community-based perspective*. AMMP-2 Final Report Volume 1. http://www.ncl.ac.uk/ammp/site_files/ public_html/finrep/.

Ministry of Health, Tanzania (2004). *The policy implications of Tanzania's mortality burden: field operations and validation studies*. AMMP-2 Final Report Volume 3. http://www.ncl.ac.uk/ammp/site_files/ public_html/finrep/.

Minturn, L. & Stashak, J. (1982). Infanticide as a terminal abortion procedure. *Behavioral Science Research, 17*(1.2), 70-90.

Mirza, N.M., Macharia, W.M., Wafula, E,M., Agwanda, R. & Onyango, F.E. (1990). Mortality patterns in a rural Kenyan community. *East African Medical Journal, 67*, 823-829.

Miyamura, S. (1997). How to calculate Gini coefficient. SOAS, Dept of Economics. Retrieved November 2007 from http://mercury.soas.ac.uk/users/sm97/.

Mohammed, A.Z., Mandong, B.M., & Mannasseh, A.N. (2003). A review of 101 homicide cases in Jos, Nigeria. *Niger Postgraduate Medicine, 10*, 13-5 *(Abstract)*

Mokwena S. (1991) *The Era of the Jackrollers: Contextualising the rise of youth gangs in Soweto.* Seminar No. 7, 1991. Centre for the Study of Violence and Reconciliation. http://www.csvr.org.za/papers/papmokw.htm.

Moshiro, C. Mswia, R., Alberti, K.G.M.M., Whiting, D.R., Unwin, N. & Setel, P.W. for the AMMP Team (2000). The importance of injury as a cause of death in Sub-Saharan Africa: Results of a community-based study in Tanzania. *Public Health, 115*, 96-102.

Mouzos, J. (1999). Femicide: An overview of major findings. Paper No. 124.*Australian Institute of Criminology: trends and issues in crime and criminal justice.* Canberra: Australian Institute of Criminology.

Muggah, R. (in press). Collective Violence. In Kobusingye et al. (Eds.) *Africa Report on Violence and Health.* Geneva: World Health Organization.

Mugunga, E.F. (2005).*Rule of Law and Access to Justice: Eliminating Rough justice in Uganda.* University of Birmingham Dissertation Master of Science (Governance and Development Management).

Muniu, E., Katsivo, M.N., Mwaura, L.W. & Amuyunzu, M. (1994). Fatal non-transport injuries in Nairobi, Kenya. *East African Medical Journal, 7,* 346-349.

Murray, C.J.L. (1987). A critical review of international mortality data. *Social Science and Medicine, 25,* 773-781.

Murray, C.J.L. & Lopez, A.D. (Eds.) (1996). *Global Burden of Disease Report.* Harvard, World Health Organization and World Bank.

Murray, C.J.L.& Lopez, A.D. (1997) Mortality by cause for eight regions of the world: Global Burden of Disease Study. *Lancet, 349,*1269-1276.

Mutasingwa, D.R.& Aaro, L.E. (2001). Injury registration in a developing country. A study based on patient's records from four hospitals in Dar es Salaam, Tanzania. *Central African Journal of Medicine, 47,* 203-209.

Mutto, C. (2007) "Getting serious about violence prevention: What's been achieved and what remains to be done" Presented at 3rd Milestones Conference of a Global Campaign for Violence Prevention, Scotland, July.

Narayan, D. & Pritchett, L. (1997). *Cents and Sociability: Household Income and Social Capital in Rural Tanzania.* World Bank Policy Research Working Paper No. 1796. Washington, D.C.: World Bank.

Naude, C.M.B., Prinsloo, J.H. & Ladikos, A. (2006). *Experiences of Crime in Thirteen African Countries: Results from the International Crime Victim Survey.* Electronic Publications, Turin. UNICRI-UNODC.

National Bureau of Statistics (2001), Tanzania. *Integrated Labour Force Survey, 2000/01 – Analytical Report.* Retrieved 2005 from http://www.nbs.go.tz/labourforce/index.htm.

National Bureau of Statistics (2002). *Household Budget Survey 2000/01.* Dar es Salaam, Tanzania.

National Bureau of Statistics (2005). 2003-2004 HIV/AIDS Indicator Survey. Retrieved December 13 2007 from http://www.measuredhs.com.

Neki, J.S., Joinet, N., Ndosi, G., Kilonzo, G., Hauli, J,G. & Duvinage, G. Witchcraft and Psychotherapy (1986). *British Journal of Psychiatry, 149*, 145-155.

Ng'walali, P.M. & Kitinya, J.N. (2006). Mob justice in Tanzania: a medico-social problem. *African Health Sciences, 6*(1),36-38.

Nordberg, E. (1994). Injuries in Africa: A review. *East African Medical Journal, 71*, 339-345.

Norman, R., Matzopoulos, R., Groenewald, P.& Bradshaw, D. (in press). The high burden of injuries in South Africa. *Bulletin of the World Health Organization.*

Noronha, C.V., Machado, E.P., Tapparelli, G.,Cordeiro,T.R., Laranjeira, D.H. & Santos, C.A. (1999). Violencia, etnia e cor: um estudo dos diferenciais na regiao metropolitana de Salvador, Bahia, Brasil. *Rev. Panam Salud Publica, 5*, 268-277.

Nwosu, S.O. & Odesanmi, W.O. (1998). Pattern of homicides in Nigeria – the Ife-Ife experience. *West African Journal of Medicine, 17*, 236-8. *(Abstract only)*

Ogungbemi, K. & Ahmed, M.H. (1993). Psychoscial aspects of murder in Nigeria. *Forensic Science International, 59,* 157-162.

Omondi-Odhiambo, van Ginneken, J.K., & Voorhoeve, A.M. (1990). Mortality by cause of death in a rural area of Machakos district, Kenya in 1975-78. *Journal of Biosoc Science, 22,* 63-75.

Outwater, A., Campbell, J.C., Webster, D. & Mgaya, E. (2007). Homicide death in Sub-Saharan Africa: A review 1970-2004. *African Safety Promotion: A Journal of Injury and Violence Prevention, 5*(1).

Outwater, A. & Shepherd, J. (2007). Information for Violence Prevention in Dar es Salaam, Tanzania. Presented at 3rd Milestones Conference of a Global Campaign for Violence Prevention, Scotland, July.

Outwater, A. H., Campbell, J. C., Rose, L. E, Kinabo, L., Tarimo, E. A.M. et al. (2008). Homicide surveillance in Dar es Salaam, Tanzania 2005: A Low Income Setting Implementation of the WHO/CDC Guidelines

Outwater, A. H., Campbell, J.C., Mgaya, E., Kinabo, L., Abrams, A. G., Kub, J. et al. (2008). Homicide deaths in Dar es Salaam, Tanzania 2005.

Overpeck, M.D., Brenner, R.A., Trumble, A.C., Trifiletti L.B. & Berendes, H.W. (1998). Risk factors for infant homicide in the United States. *New England Journal of Medicine, 339*(17),1211-6.

Paavola, J. (2003). Vulnerability to climate change in Tanzania: Sources, substance and solutions. Presented at the inaugural workshop of Southern Africa Vulnerability Initiative, Mozambique.

Paciotti,B. & Mulder, M.B. (2004) Sungusungu: The role of pre-existing and evolving social institutions among Tanzanian vigilante organizations. *Human Organization,* p.1-17. Retrieved 19 November 2007 from http://findarticles.com/p/articles/mi_qa3800.

Paulozzi, L. & Sells, M. (2002). Variation in Homicide Risk During Infancy --- United States, 1989—1998. *Mortality and Mortality Weekly Report, 51*(09), 187-9.

Paulsen, D.J. (2002). Wrong side of the tracks: Exploring the role of newspaper coverage of homicide in socially constructing dangerous places. *Journal of Criminal Justice and Popular Culture; 9*(3): 113-127.

Peden, M., McGee, K., & Sharma, G. (2002). *The injury chart book: A graphical review of the global burden of injuries.* Geneva: WHO.

Peelo, M., Francis, B., Soothill, K., Pearson, J. & Ackerley,E. (2002) The Public Construction of Justice: Homicide Reporting in the Press. Working Paper from Center for Applied Statistics. Lancaster University.

Pelser, E. (1999). *The challenges of community policing in South Africa.* Occasional Paper No. 42. Institute for Security Studies. Retrieved August 2007 from http://www.iss.co.za/Pubs/Papers/42/Paper42.html.

Population Reference Bureau [PRB] (2006). World Population Country Profiles: Tanzania.Retrieved August 2007 from http://www.prb.org/datafind/prjprbdata/wcprdata7.

Presser, S., Couper, M.P., Lessler, J.T., Martin, E., Martin, J., Rothgeb, J.M., Singer, E. (2004). Methods for testing and evaluating survey questions. *Public Opinion Quarterly, 68*(1), 109-130.

Prinsloo, M. and Project team: Donson, H., Hendricks, N., Krige,**A.,** Louw, L., Maruping, M., Matzopoulos, R., Neethling,I., Ross, K., Sukhai, A. Swart., L-A. (2007). *A profile of fatal injuries in South Africa: 7th Annual Report of the National Injury Mortality Surveillance System, 2005.* South Africa: Medical Research Council and UNISA Institute for Social and Health Sciences.

Prothrow-Stith, D. & Spivak, H.(2004). *Murder is No Accident: Understanding and Preventing Youth Violence in America.* San Francisco, CA: Jossey Bass Publishers.

Prinsloo et al. (in press). *7th Annual report of the National Injury Mortality Surveillance System*: South Africa: Medical Research Council and UNISA Institute for Social and Health Sciences.

Pronyk, P.M., Hargreaves, J.R., Kim, J., Morison, L.A., Phetla, G., Watts, C., Busza, J., & Porter, J.D.H. (2006). "Effect of a structural intervention for the prevention of intimate-partner violence and HIV in rural South Africa: a cluster randomised trial", *The Lancet, 368*,1973-1983.

Republic of Tanzania (2002). *Integrated Labour Force Survey 2000/01* - Analytical Report.

Republic of Tanzania (2003). *2002 Population and Housing Census.* Retrieved 12/15/2006 from http://www.tanzania.go.tz/census.

Research and Analysis Working Group[R&AWG] (2002). *Poverty and Human Development Report 2002*. Tanzania: Mkuki na Nyota Publishers.

Research and Analysis Working Group[R&AWG] (2005). *Poverty and Human Development Report 2005*. Tanzania: Mkuki na Nyota Publishers.

Resnick, P.J. (1970). Murder of the Newborn: A psychiatric review of Neonaticide. *American Journal of Psychiatry, 126*(10), 1414-1420.

Reza, A., Anderson, M., Mercy, J.A.(2007). A public health approach to preventing the health consequences of armed conflict (draft copy). In: Levy BS, Sidel VW, eds. *War and Public Health*, Second Edition. New York: Oxford University Press.

Reza, A., Mercy, J.A. & Krug, E. (2001). Epidemiology of violent deaths in the world. *Injury Prevention, 7*,104-111.

Rucyahana, J & Riordan, J. (2007).*The Bishop of Rwanda: finding forgiveness amidst a pile of bones*. Tennessee, USA:Thomas Nelson.

Rummel, R. (1997). *Statistics of Democide: Genocide and Mass Murder since 1900*. Charlottesville, Virginia: Center for National Security Law.

Sampson, R., Raudenbush, S.W., & Earls, F. (1997). Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science,* 277, 918-924.

Sandelowski, M. (1995). Qualitative Analysis: What it is and how to begin *Research in Nursing & Health, 28*, 371-375.

Sandelowski, M. (2000). Combining qualitative and quantitative sampling, data collection, and analysis techniques in mixed-method studies. *Research in Nursing & Health, 23*, 246-255.

Sandelowski, M. & Barroso J (2002). Finding the findings in qualitative studies. *Clinical Scholarship, 34*(3), 213-219.

SAPA. South African Press Agency (1 December 2006). Man targeted by mob after witchcraft rumours. Retrieved April 2007 from www.int.iol.co.za. .

SAPA. South African Press Agency (February 24, 2007). Mob justice after cellphone theft. Retrieved May 2007 from www.int.iol.co.za.

Scholtz, H.J., Phillips, V.M. & Knobel, G.J. (1997). Muti or ritual murder. *Forensic Science International, 87,* 117-123.

Schnurr, P.P. & Green, B.L. (2003). *Trauma and Health: Physical health consequences of exposure to extreme stress.* Washington, D.C.: American Psychological Association.

Scottish Government, Statistical Bulletin CrJ/2005/12. *Homicide in Scotland, 2004/05.* Retrieved 20 November 2005 from www.scotland.gov.uk/Publications/2005 on 20 November 2007.

Sekher, T.V. & Hatti, N. (2005). Discrimination of female children in modern India: from conception through childhood. Presented at International Union for the Scientific Study of Population XXV International Population Conference. Retrieved 17 October, 2007 from http://iussp2005.princeton.edu.

Seleye-Fubara, D. & Etebu, E.N. (2003). Homicide in Port Harcourt Rivers State. *Nigerian Journal of Orthopaedics & Trauma, 2(*2),120-123. *(Abstract only.)*

Sethi, D., Habibula, S., McGee, K., Peden, M., Bennett, S., Hyder, A.A., Klevens, J., Odero, W. & Suriyawongpaisal, P. (2004). *Guidelines for conducting community surveys on injuries and violence.* Geneva: World Health Organization.

Sethi, D., Marais, S., Seedat, M,. Nurse, J. & Butchart, A. (2004). *Handbook for the documentation of interpersonal violence prevention programmes.* Department of Injuries and Violence Prevention, World Health Organization, Geneva, 2004.

Sharma, G. (2004). Secular trend of firearm-related homicide rates in 22 countries. Abstr. *7th World Conference on Injury Prevention and Safety Promotion.* Vienna.

Sharma, B.R. (2006). Historical and Medico-legal Aspects of Infanticide: An overview. *Med. Sci. Law, 46*(2),152-156.

Simon, D., McGregor, D. & Nsiah-Gyabaah, K. (2004) The changing urban-rural interface of African cities: the definitional issues and an application to Kumasi, Ghana. *Environment and Urbanization, 16*, 235.

Smith, T.W. (2004). Developing and evaluating cross-national survey instruments. In *Methods for testing and evaluating survey questionnaires.* New Jersey: John Wiley & Sons, Inc.

Sorenson, S.B., Peterson Manz, J.G. & Berk, R.A. (1998) News Media Coverage and the Epidemiology of Homicide. *American Journal of Public Health, 88*(10), 1510-1514.

Statesman, Ghana. (April 12, 2007). Editorial:The law must act against the Lynch-Mob Syndrome. Retrieved 15 April 2007 from http://www.ghanaweb.com/GhanaHomePage/NewsArchive/artikel.php?ID=122384

Steenland, K., Halperin, W., Hu, S. & Walker, J.T. (2002). Deaths due to injuries among employed adults: The effects of socioeconomic class. *Epidemiology, 4,* 74-79.

Sutherland, B. & Meyer, B. (2000). Guns and Ghandi in Africa. New Jersey & Eritrea: Africa World Press, Inc.

Taguchi, H. (2007). Maternal filicide in Japan: Analyses of 96 cases and future directions for prevention. *Seishin Shinkeigaku Zasshi, 109*(2), 110-27. (Abstract only.)

Tashakkori, A., & Teddlie, C. (1998). *Mixed methodology: combining qualitative and quantitative approaches.* Thousand Oaks, CA: Sage.

Taylor, C.S. (1990). *Dangerous Society.* East Lansing, Michigan: Michigan State University Press.

Teret, S.P. (1986). Litigating for the public's health. *American Journal of Public Health, 76*, 1027-1029.

Titterington, V.B. & Grundies, V. (2007). An exploratory analysis of German and U.S. youthful homicide offending. *Homicide Studies: An interdisciplinary & International Journal, 11*(3), 189-212.

Tobin, G. & Begley, C. (2004). Methodological rigour within a qualitative framework. *Journal of Advanced Nursing, 48*(4), 388-396.

United Nations (1948). *Universal Declaration for Human Rights.* General Assembly resolution 217 A (III) of 10 December 1948.

United Nations (2005).Full employment and decent work for all: Regional Highlights http://www.un.org/Depts/rcnyo/newsletter/0623051.

United Nations Development Programme [UNDP] (2002). *Human Development Report 2002: Deeping democracy in a fragmented world.* Oxford: Oxford University Press for UNDP.

United Nations Office on Drugs and Crime, Centre for International Crime Prevention (2006). *The Ninth United Nations Survey on Crime Trends and the Operations of Criminal Justice Systems (2003 - 2004).* Retrieved December 2007 from http://www.geocities.com/dtmcbride/reference/crime_world.html

United Nations Secretariat, (2006). *World Population Prospects: The 2006 Revision* and *World Urbanization Prospects: The 2005 Revision* Population Division of the Department of Economic and Social Affairs. Retrieved 25 October 2007 from http://esa.un.org/unpp.

United States Department of State. (March 31, 2003). *Central African Republic. Country Reports on Human Rights Practices - 2002.* Released by the Bureau of Democracy, Human Rights, and Labor. Retreived April 2007 from http://www.state.gov/g/drl/rls/hrrpt/2002/18174.htm.

Van Geldermalsen, A.A. & Van der Stuyft, P. (1993). Interpersonal violence: patterns in a Bashoto community. *Journal of Tropical Medicine and Hygiene, 96*, 93-99.

Walton-Moss, B.J. Campbell, J.C. (2002). Intimate partner violence: Implications for Nursing. *Online Journal of issues in Nursing,* 7(1), Ms.5.

Ward, E. (2006). Violence prevention work in the Caribbean: Successes, Promises and Challenges. Presentation at South Africa, World Conference on Safety Promotion and Violence Prevention.

Watts, C., Osam, S., & Win, E. (2001). Femicide in Southern Africa. In D. E. Russell & R. A. Harmes, (Eds.) *Femicide in Global Perspective*. New York, New York: Teachers College Press, , pp. 89-99.

Wester, D.W., Vernick, J.S., Hepburn, L.M. (2002). Effects of Maryland's Law

banning "Saturday Night Specials" Handguns on Homicides. *American Journal of Epidemiology, 155*(5), 406-412.

Wigton, A. (1999). (Editorial) Figures about firearms-what are the facts. *South African Medical Journal 89*, 396.

Wigton, A. (1999). Firearm-related injuries and deaths among children and adolescents in Cape Town – 1992-1996. *South African Medical Journal, 89*, 407-410.

Wilson, D.C. & Medard, M. (1994). Programme on the Lakes of East Africa socio-economic data set for Lake Victoria. Tanzania Fisheries Institute, Mwanza Station and African Studies Center, Michigan State University. Retrieved 2004 from http://africa.msu.edu/PLEA/tanset.htm.

Winslow, R. (on-going). *Crime and Society: A Comparative Criminology Tour of the World.* Retrieved 15 April 2007 from <www-rohan.Sdsu.edu/rwinslow/Africa.

World Bank. *World Development Indicators 2005.* Retrieved February, 2007 from http://devdata.worldbank.org.

World Health Organization [WHO] (2002). Global Burden of Disease Report WHO. Health statistics and health information systems. Retrieved July 2007 from http://www.who.int/healthinfo/bodgbd2002revised.

World Health Organization [WHO] (2003). Resolution A56/24: Implementing the Recommendations of the *World report on violence and health.* 56th World Health Assembly.

World Health Organization [WHO](2003). *International Statistical Classification of Diseases and Related Health Problems.* 10th Revision. Geneva: WHO.

World Health Organization Statistical Information System [WHOSIS] (2007).

Retrieved September 2007 from

http://www.who.int/whosis/database/core/core_select.cfm

Wyndham, C.H. (1984). Leading causes of death among children under 5 years in the various populations groups of RSA in1970. *South African Medical Journal, 66,* 717-18.

Wyndham, C.H. (1986). Deaths from accidents, poisoning and violence-differences between the various population groups in the RSA. *South African Medical Journal, 69,* 556-558.

Zahn, M.A. & McCall, P.L. (1999). Trends and patterns of homicide in the 20th-century United States. In Eds. Smith, M.D & Zahn, M.A. *Homicide: A Sourcebook of Social Research.* Thousand Oaks, London, New Delhi: Sage Publications.

Zeng, Y., Tu, P., Gu, B., Xu, Y., Li, B. & Li, Y. (1992) Sex ratio of China's population deserves attention. *China Population Today* ; 9 :3-5. In Jha, Kumar, Vasa, Dhingra, Thiruchelvan & Moineddin, (2006).