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**An Investigation of Firearm-Related Injuries and Fatalities amongst
Children in the Cape Metropolitan Area (2001 – 2006)**

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DECLARATION

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

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**An investigation of firearm-related injuries and fatalities amongst
children in the Cape Metropolitan Area (2001 – 2006)**

Tasneem Matthews

Keywords

Firearms

Firearm-related injuries

Firearm-related fatalities

Children

Cape Metropolitan Area

Legislation

Violence

Child rights

Child protection

Safety

ABSTRACT

Objectives:

This research investigates the extent of firearm-related injuries and deaths amongst children in the Cape Metropolitan Area. It describes the profile of firearm-related injuries and deaths amongst children, and identifies and describes relevant legislation and policies as they relate to the research findings.

Design:

This was a retrospective cross-sectional study that investigated available hospital and mortuary data in the Cape Metropolitan Area for a six year period from the year 2001 to 2006.

Results:

The main findings of this study indicated that older boys generally had greater exposure to firearm-related injuries. Results indicate that for every female death there were four male deaths. Younger children were most in danger of getting caught in crossfire. Khayelitsha and Mitchell's Plain were identified as areas with the highest incidence of gunshots. Injuries presented at hospitals were mostly limb injuries. Homicide accounted for 95% of firearm-related deaths seen in this study. The trend between 2001 and 2006 indicated a dramatic decline in injuries and deaths in 2005, and a 10% increase in 2006.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

All South Africans have the right to freedom and security of the person. This right includes the right to be free from all forms of violence from public or private sources (Constitution 1996 of the Republic of South African, 1996).

This right is violated when a child is injured or killed as a result of the use of a firearm. Pinheiro (2006) states that violence against children is recognised at a global level as an area where in-depth information is needed; as well as recommendations for the improvement of legislation, policy and programmes that relate to the prevention of violence against children. This can be done through the provision of evidence that sheds light on the situation of children who find themselves in circumstances related to violence.

There are limited data about the causes of non-natural deaths amongst children, especially adolescents in the 15-18-year old category, which complicates the presentation of the main causes of deaths for this age group (Abrahams, 2006). Firearm-related injury or death is defined under the indicator of non-natural deaths, which means that the death is not caused by any medical condition or disease. There are not many South African studies that focus specifically on children and firearm-related injuries. However a snapshot of the proportion of non-natural deaths of adults and children can be accessed from the surveillance system maintained by the Medical Research Council of South Africa (MRC). In a

study by the National Injury Mortality Surveillance Systems (NIMSS) conducted between January and December 2004, it was found that the leading cause of non-natural deaths was homicide. This accounted for 39.8% of all fatal injuries in South Africa. Firearm-related injuries were one of the leading causes of fatal injuries (Matzopolous, 2005).

1.2 Background

This study was conducted at the Children's Institute (CI), University of Cape Town. The CI is connected to a long history of credible research, advocacy and institutional knowledge about firearm-related injuries and fatalities amongst children, and the law reform process that resulted in the Firearms Control Act of 2000.

In the early 1990s, the high incidence of firearm-related deaths and injuries in South Africa gave rise to a rigorous civil society campaign for stricter gun control. The call for stricter gun control was taken up in 1994 by a civil society organisation called Gun Free South Africa (GFSA). In response to GFSA's call for stricter gun control, which highlighted the high incidence of firearm-related deaths, the government initiated a process of examining existing firearms control legislation, and explored ways of improving the law (Shung-King, Proudlock & Michelson, 2005). A national government policy and law reform process culminated in the new Firearms Control Act of 2000, which came into effect in 2004. This Act replaced the Arms and Ammunition Act of 1969.

The CI's predecessor organisation, the Child Health Policy Institute (CHPI), played a significant research and advocacy role in producing evidence on the extent and characteristics of firearm-related injuries to children. In 1998 the CHPI released a research report of a five-year period study that looked at data from 1992–1996. It described firearm-related injuries and fatalities amongst children in the Cape Metropolitan Area (Wigton, 1998). The study confirmed a rising number of firearm-related injuries amongst children. The majority of these children were adolescent males living in areas where poverty, drugs and gang-related activities were rife. Results were disseminated as part of an extensive communication and advocacy strategy in collaboration with the Gun Control Alliance (GCA) and the Government Secretariat for Safety and Security. The study was cited in the government's *Fact Book on Firearms* that was launched alongside the new policy on stricter gun control. From 1999 to 2000 the CHPI represented the children's sector in a co-ordinated law reform campaign led by the GCA, and actively participated in the debates on and passage of the Firearms Control Bill in parliament. The CHPI's combination of evidence-based research, advocacy and strategic collaboration with the GCA made significant contributions to the firearms control legislation. Over 80% of the recommendations of the GCA (and the CHPI) were incorporated in the Bill that later became the Firearms Control Act of 2000 (Shung-King et al., 2005).

In 2006 an amendment to the Firearms Control Act was tabled in Parliament. This event provided a new window of opportunity to bring evidence to the table,

and to further motivate amendments to the Act to protect children. Important clauses in the 2000 Act were also at risk of being diluted due to complaints from gun owners and manufacturers. It was therefore essential to ensure that important clauses that could further protect children would not disappear from Parliament's agenda.

The CI and the author of this thesis have since produced further outputs in the area of firearm-related injuries and fatalities amongst children. These include:

- a case study report that describes the impact of the CHPI's research and advocacy on firearms control legislation;
- a fact sheet on firearm-related injuries and fatalities amongst children in the Cape Metropolitan Area;
- a submission to the Portfolio Committee of Safety and Security during the Firearms Control Amendment Bill parliamentary hearings in August 2006;
- an opinion-editorial about stricter gun control and child safety, published in daily newspapers in Durban, Pretoria and Cape Town.

Concerns about firearm-related child injuries and fatalities were again raised at a round table discussion hosted by the CI's *Child Survival Project* in May 2006. Round table participants included various experts in health and other fields as well as members of government and civil society. The event generated a considerable amount of media coverage.

Participants agreed that one way of ensuring that children are placed on Parliament's agenda would be to participate in parliamentary hearings on the Firearms Control Amendment Bill that was held in August 2006. Presenting information at the hearings about the impact of firearms and violence in the lives of children raised awareness of child fatality and injury as a result of the use of firearms. The CI's participation in making submissions and providing evidence-based advocacy on child injury and fatality as a result of firearms ignited the need for further research. This need formed the basis for the commencement of this study.

1.3 Rationale

According to the South African Constitution and the United Nations Convention on the Rights of the Child (UNCRC) a "child" is defined as any person under the age of 18 years (South African Constitution, Act 108 of 1996, Section 28(3); UNCRC, 1989). Even though South Africa recognises children to be under the age of 18, there are insufficient data on the causes of deaths and injuries of all children, and more specifically, older children. We do however know that a greater proportion of children die because of injuries or non-natural deaths as the age group increases (Bradshaw, Bourne & Nannan, 2003).

Statistics South Africa's (2007) report on mortality stated that in 2005 the Western Cape had the highest percentage (15%) of deaths attributed to non-natural causes. Gauteng had the second highest percentage of non-natural causes of deaths (10.7%), followed by the Northern Cape (9.8%). The Free State

had the lowest percentage of deaths attributed to non-natural causes (6.5%). The high number of non-natural deaths in the Western Cape served as further motivation for conducting this study in the Cape Metropolitan Area.

The importance of paying attention to issues related to older children was raised by the South African president in 2007:

...we have also started examining measures to reach vulnerable children over the age of 14 years....

(Mbeki, 2007)

The President's concern about children over the age of 14 was motivated by the need to reach all children and address all issues that make them vulnerable. An investigation of the epidemiological profile of firearm-related injuries and deaths will provide insight into this substantial contributor to non-natural deaths amongst children. This knowledge can be used to inform policy or law reform, service delivery, programme implementation, and future research.

1.4 Aim

The aim of this study is to provide an epidemiological profile of firearm-related injuries and fatalities amongst children in the Cape Metropolitan Area, and thereby contributing to knowledge about firearm-related injuries of children.

1.5 Objectives

The objectives of this study are as follows:

1. To investigate the extent of firearm-related injuries and fatalities amongst children.
2. To determine the epidemiological profile of children who were shot during the period of 2001 and 2006.
3. To identify relevant legislation and policies in relation to the research findings.

1.6 Overview of the thesis

Chapter 1 includes an introduction to the study, its background, the rationale of the study, the aims and objectives of the study, and an overview of the thesis.

Chapter 2 will focus on the literature review, including the concept of violence, South African and international studies that focus on firearm-related injuries and fatalities, and relevant legislation.

Chapter 3 expands on the methods used for data collection and analysis. This will include the methodological framework, the sample, sample selection, data analysis, and ethical considerations.

Chapter 4 will communicate the results that emerged from the study.

Chapter 5 will inform the results described in Chapter 4 through discussion. This will encompass summarising the main findings; and an explanation of the findings in relation to the relevant literature.

Chapter 6 provides recommendations based on the findings of the study. It will also include the limitations of the study, future research recommendations, and the conclusion.

The referencing style used throughout this thesis is consistent to that of the APA (American Psychological Association) which is an accepted referencing style at the University of Cape Town.

University of Cape Town

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter describes some of the relevant literature on firearm-related injuries and fatalities; with a focus on violence, existing national and international studies, and relevant legislation as it relates to children and firearms.

2.2 Children in South Africa

As previously mentioned, a "child" is defined as any person under the age of 18 years (South African Constitution, Act 108 of 1996, Section 28(3); UNCRC, 1989). This definition is important methodologically, as it is a guiding principle for inclusion of cases in this research.

In 2006, just over 18.2 million children were living in South Africa. This constituted 38% of the South African population. This can be broken down by province with 21% of children living in KwaZulu-Natal, 17% in the Eastern Cape, 15% in Gauteng and Limpopo each and 9% in the Western Cape. Numbers of children in the other provinces (Free State, Mpumalanga, North West and Northern Cape) are relatively small (Meintjies, John-Langba & Berry, 2008). Children in the 6-12-year age group account for approximately 38% of the South African child population, followed by 0-5-year olds (34%) and older children aged 13-17 (28%) Investing in the survival of this large portion of the country's

population is of paramount importance to ensure the development and growth of South Africa. Child survival is also inextricably linked to child development. Children therefore have the right to survive under conditions that enable them to develop to their full potential. (Dutschke & Abrahams, 2006).

Bradshaw *et al.* (2003) explain that, as children get older, external causes of death rise in importance. They add that this is particularly noticeable amongst boys, who die in greater numbers than girls. This research data were analysed by the Burden of Disease Research Unit at the MRC. The studies reviewed below echo some of these findings.

2.3 Existing national studies

While existing local studies focus on a range of causes of non-natural deaths and injuries, ranging from poisoning to burns and drowning, very few studies isolate specific types of injuries or causes of death. There are, however, South African studies that provide a description or an epidemiological profile of children and firearm-related injuries, such as the one conducted by Wigton in the late 1990s. The study conducted by Wigton has been referred to in many other research projects and media reports that relate to firearm-related injuries and fatalities. Wigton's use of empirical data as a tool for advocating stricter gun control and safety for children provided valuable contributions to the decision-making process on firearms legislation.

This local study, by the CI, focused on firearm-related injuries and deaths amongst children and adolescents in Cape Town between 1992 and 1996. Wigton (1999) indicated that one of the objectives of the study was to understand the problem of firearm violence as a public health problem in South Africa. For the study period, Wigton found that at least 1,736 children and adolescents were victims of firearm-related incidents. Of these 322 (19%) died. The incidence of firearm-related injuries amongst this group almost tripled from 20.2 per 100,000 in 1992 to 58.1 per 100,000 in 1996. The firearm fatality rate also almost tripled during the period under review, from 3.8 per 100,000 in 1992 to 10.3 per 100,000 in 1996. Approximately 60% of victims were coloured males, with 86% between 13 and 18 years of age. Furthermore, Wigton (1999) noted that 20% of all victims aged over 12 years who died were intoxicated.

Meel (2005) conducted a primarily rural-based study in the Eastern Cape region of South Africa on firearm fatalities between periods of 1993-2004. The study aimed to determine the incidence of firearm-related deaths in the Eastern Cape, and to further understand the underlying causal factors. A record review of medico-legal autopsies was examined at Umtata General Hospital. The study found that firearm-related deaths accounted for 29% of all traumatic deaths and males accounted for 82% of those deaths. Meel (2005) also found that the average number of firearm-related deaths during 1993-2004 was 48.4 per 100,000 of the population per year. Furthermore, the rate increased from 27 per 100,000 in 1993 to 42 per 100,000 in 2004. Meel (2005) adds that this rate

reached its peak at 67.8 per 100,000 in 2001. Unlike Wigton (1999), Meel (2005) focused on all age groups.

2.4 Existing international studies

A national study on non-fatal and fatal firearm-related injuries amongst children aged 14 years and younger was conducted in the United States from 1993-2000 (Gabriel, Joseph, James & George, 2004). The objective of this study was to provide national estimates of firearm-related injuries and deaths amongst children as well as to examine the circumstances in which the injuries occurred. This was done by investigating the data from the National Electronic Surveillance System (NEISS) in the United States. The NEISS data extracted information from hospitals and they examined 22,661 cases. It logged the age, sex, race, primary body part affected, intent of the injury, where the injury occurred and the relationship of the shooter to the patient. This study found most firearm-related deaths were related to violence, which is described as 'intentional injuries with homicide constituting the highest percentages of these incidents. Gabriel et al. (2004) also note that, for individuals 14 years or younger, the burden of mortality falls disproportionately on boys, and is most prevalent in children 10 to 14 years old. Although this study focused on children, it did not focus on children younger than 10 years nor children aged between 15 -17.

A study conducted by Eber, Annest, Mercy and Ryan (2004) investigated non-fatal and fatal firearm-related injuries amongst children aged 14 years and younger in the United States for the time period 1993 and 2000. They examined

and analysed data from the surveillance systems of hospital's emergency departments. Information recorded included age, sex, race, relationship of patient to the shooter, body part affected, intent of injury and activity at the time of the injury. Similar to the NEISS study, Eber et al. (2004) found that approximately four out of five children who sustained a non-fatal, unintentional firearm-related injury reportedly shot themselves or were shot by a friend, a relative or another person known to them. They also found that, for individuals 14 years or younger, the burden of mortality associated with firearm-related injuries falls disproportionately on, in order of significance, black children, boys, and children aged 10–14 years.

A case study conducted in Recife, Brazil, focused on homicide in children and adolescents. Interviews were conducted with the families and neighbours of the children to identify factors that were potentially modifiable through preventative interventions (Falbo, Buzzetti & Cattaneo, 2001). The findings of this study indicated that firearms were responsible for 97% of the deaths and these occurred predominantly amongst older males aged 15–19 years involved incidents of violence.

2.5 Violence

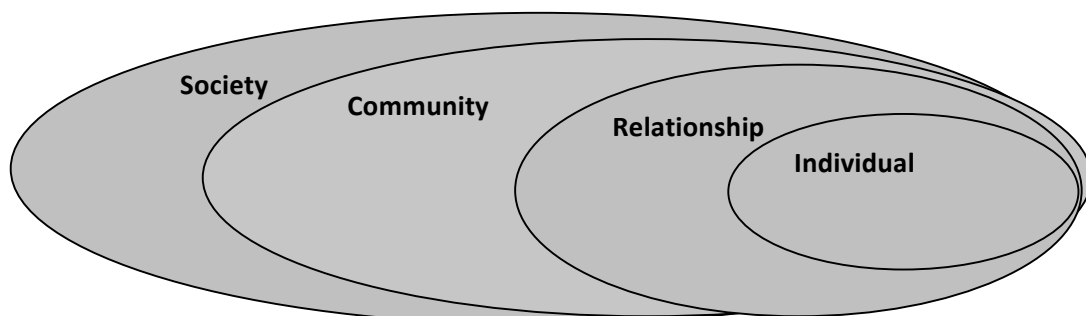
The World Health Organisation states that each year over 1.6 million people worldwide lose their lives to violence. Violence is amongst the leading causes of deaths for people aged 15–44 years worldwide, accounting for 14% of deaths amongst males and 7% of deaths amongst females.

(http://www.who.int/violence_injury_prevention/violence/en/)

Children are far more often victims of violence than perpetrators of violence (Calouste Gulnejian Foundation, 1995). Violence against children takes many forms: children are sexually abused and exploited; they endure physical and humiliating punishment; they are exposed to neglect, torture, forced labour, harmful traditional practices, and murder. Whether in the home, in school or institutions, violence can happen any time, any place, anywhere (Bond, 2006). Bearing this in mind, the concept of violence and its impact can be understood as filtering through different niches within society. In other words, when violence is inflicted on an individual or a group of individuals, it eventually affects all realms of social life.

Figure 1.1 is a model used by the World Health Organisation (WHO) to describe the ecological model for the conceptual understanding of violence (Garcia-Moreno, Jansen, Ellsberg, Heise & Watts 2005). Garcia-Moreno et al. (2005) suggest that this model can best be conceptualised as four nested circles, and outlines a holistic view of violence and its effects.

Figure 1.1 Ecological model for understanding violence



Source: Adapted from Garcia-Moreno et al. (2006)

- The innermost circle represents the biological and personal history that each individual brings to his or her behaviour in relationships.
- The second circle represents intermediate context in which violence takes place – frequently in the family or other intimate or acquaintance relationships.
- The third circle represents the institutions and social structures, both formal and informal, in which relationships are embedded – neighbourhood, workplace, social networks and peer groups.
- The fourth, outermost circle is the economic and social environment, including cultural norms.

This model provides an overview for understanding that violence takes place at all levels. Furthermore, if an individual (the child) is affected by violence, it impacts on all spheres of his or her life. This study does not assume that all firearm-related injuries or deaths are directly related to violence in that some can be accidental injuries; however it acknowledges that the roots and history of firearms are nested in violence. Existing local and international studies also describe violence as a common theme in the studies on firearm-related injuries and deaths. Violence in this study can be best defined as interpersonal violence.

“Interpersonal violence is violence between individuals or small groups of individuals. It is an insidious and frequently deadly social problem that includes

child maltreatment, youth violence, intimate partner violence, sexual violence and elder abuse. It takes place in the home, on the streets and in other public settings, in the workplace, and in institutions such as schools, hospitals and residential care facilities. The direct and indirect financial costs of such violence are staggering, as are the social and human costs that cause untold damage to the economic and social fabric of communities” (Garcia-Moreno et al., 2005, p.13). This definition and the model encapsulate the meaning of violence in this study.

2.6 Contexts of gun violence

Children around the world are exposed to gun violence, ranging from domestic violence to larger scale armed conflict. In a study on post-traumatic stress amongst child soldiers in former Uganda; Derluyn, Broekaert, Schuyten and Temmerman (2004) state that at the time of the study, 300,000 children were used as child soldiers in armed conflicts worldwide. A large proportion of these children were from Africa. In 1999 it was estimated that more than 9,000 children in Angola, and between 8,000 and 10,000 in Mozambique, participated in conflicts as soldiers (Honwana, 1999). Armed conflict also heightens children’s risk of being exposed to abuse, violence and exploitation (UNICEF, 2006).

Armed conflict on a national or international scale, however, only accounts for a small population of children involved in the use of firearms. In many instances, including in South Africa, the majority of firearm-related injuries occur amongst

children living in impoverished communities where violence is prevalent (Shung-King et al., 2005).

In an international study, conducted in ten countries, which explored the role of children in organised armed violence, gangs in the Cape Town area were selected as the South African focus (Frank, 2005). Most of the participating countries were developing countries like South Africa, with poverty and unemployment being two major factors associated with gang-related and youth violence. Frank (2005) explains that poverty and unemployment contribute to the underlying causes that influence children to join gangs and participate in violence involving firearms and other weapons, such as knives. Studies conducted in the Western Cape indicated that a large proportion of children who were killed as a result of gunshot wounds lived on the Cape Flats areas of Mitchell's Plain, Hanover Park, Philippi, Manenberg, Bishop Lavis and Elsies River. These are areas which display high levels of unemployment and violence (Frank, 2005; Wigton, 1998).

2.7 Effects of violence on children

Children's exposure to violence puts them at risk of developing a variety of problems, including depression, anxiety, and other behavioural problems (Ward, Theron & Distiller, 2007). From their study on South African children's exposure to violence and their psychological adjustment, Barbarin, Richter and De Wet (2001) found that exposure to vicarious violence produces effects parallel to those observed when the violence involves direct victimisation. They added that

the effects of violence on psychological and academic functioning were found to be independent of gender and socio-economic status. Furthermore, males and females, both the economically advantaged and disadvantaged, all presented similar difficulties in the face of violence.

As reflected in the WHO model in Figure 1.1, the consequences of gun violence and injury are not only physical disability and emotional trauma to the victim; but also the effect on families and entire communities. Communities with gang-related violence and high crime, overcrowding, poor basic amenities, lack of infrastructure (for example, leisure pursuits) and poor safety and security, provide opportunities in which firearm-related injuries and fatalities can occur. Many of these issues stem from poverty. The largest, current contributor to household poverty in South Africa is the very high rate of unemployment (Leatt, Rosa & Hall, 2005).

Where possible, Wigton (1998) obtained information regarding the blood alcohol content of the teenagers who died. The correlation between the use of substances and violence is important. Young South Africans, especially in the Western Cape, are now faced with the challenge of the use of 'tik', the colloquial name for methamphetamine or crystal methamphetamine. In 2003, it was noted that approximately 31% of high school students in Cape Town used alcohol and 7% used cannabis. This was derived from a sample size of 2,946 grade 8 and 11 students from 39 public schools in Cape Town (Flisher, Parry, Evans, Muller & Lombard, 2003). The NIMSS 2003 results also indicated that alcohol was an important risk factor to account for when exploring the causes of violent deaths

(Matzopolous, 2005). According to the Cape Town Drug Counselling Centre's annual report, the largest percentage of people seeking treatment at the centre was from the area of Mitchell's Plain. Other areas included Strandfontein, Athlone, Bonteheuwel, Grassy Park and Woodstock (Cape Town Drug Counselling Centre, 2007). These are similar locations to the ones identified as 'hotspots' for a high incidence of firearm-related violence (Prinsloo, 2005).

Some academics argue that violence in the media can also affect children. Van As and Ramanjan (2008) write on the effects of violence in the media on children. Researchers believe that children aged 7 and younger are particularly vulnerable to the effects of viewing violence, because they tend to perceive fantasy and cartoon violence as realistic (Van As & Ramanjan, 2008). They add that unsupervised television viewing is likely to be more common in poorer communities, because of the pressure on parents to work long hours far away from their residence. The effects of media violence are not always as explicit as exposure to physical violence. However, acknowledging its potential dangers to children further highlights their vulnerabilities and need for protection.

2.8 Legislative environment

The right to life is perhaps one of the most important rights that must be respected. This right is often violated through the misuse of firearms

The United Nations Firearms Protocol was the world's first global treaty on firearms. The aim of this protocol is to promote, facilitate and strengthen co-operation amongst States to prevent, combat and eradicate the illicit manufacturing of and trafficking in firearms, their parts and components (Qoma, 2005). South Africa signed the protocol in October 2002 and ratified it in February 2004. The United States Constitution provides that the right of the people "to keep and bear arms, shall not be infringed". South African's gun legislation is much stricter than the USA's, and South Africans do not hold the constitutional right to keep or bear firearms.

As previously stated, all South Africans have the right to freedom and security of the person; this right includes the right to be free from all forms of violence from public or private sources (Section 12 of the South African Constitution, Act 108 1996). This right along with other human rights should be realised through legislation. South Africa's current firearms control legislations is strict – it is the implementation of this law that is problematic. However, during preparations for the implementation of the Firearms Control Act, the South African Police Service developed a five-pillar strategy for combating the proliferation of firearms in South Africa (Meek & Stott, 2004).

The five pillars are:

- Pillar one: Develop and maintain appropriate firearm-related regulations
- Pillar two: Develop and maintain effective control and processes and procedures regarding firearms

- Pillar three: Reduce and eradicate the illegal pool and the criminal use of firearms
- Pillar four: Prevent crime and violence through awareness and social crime - prevention partnerships, including campaigns to educate and raise awareness amongst the public
- Pillar five: Develop regional and sector cooperation

The implementation of both the Act and the South African Police Services (SAPS) strategy can be further strengthened and aided through the process of *proactive policing* (Meek and Stott, 2004). Reviewing the trends of child injuries and fatalities as a result of firearms can provide bodies such as the SAPS and the Cape Metropole with evidence that can be drawn on to ensure safer communities.

2.9 Conclusion

The literature reviewed in this chapter helped define the chapters to come, and is used in the discussion in Chapter 5 to support and add value to the results. The following chapter describes the process of data collection and the methodologies used to execute this research.

CHAPTER 3

PRIMARY RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter discusses the methodological framework used in this study. It explains the research design and the methods of extraction and analysis of the data.

3.2 Study design

This study comprises three parts: (1) A retrospective cross-sectional study that collated and analysed available hospital data. (2) A retrospective study that collated and analysed mortuary data for a six year period starting from 2001 to 2006. It used quantitative methodologies to achieve its objectives. (3) Identification of all relevant legislation and policies in relation to the research findings (1 & 2).

3.3 Inclusion criteria and sample size

All hospital data were extracted from hospital registers located in the trauma unit of each hospital. Registers contain the information of all patients that arrive at the hospital trauma unit, All recorded cases of children who were admitted with, or died of, firearm-related injuries were included in this study. Based on the definition of a child as discussed in the literature, only children under the age of

18 were included. All cases reviewed were part of the Cape Metropolitan Area, which includes all urban areas in the Cape Town area, and excludes rural and peri-urban areas such as Stellenbosch, Paarl and Worcester. Only readily available patient folders were included. Not all patient folders could be accessed, as they were, for instance, with doctors at the time of the study, or not present in the institution at the time the research was conducted. It is for this reason that the exact number of missing folders could not be established. After applying the inclusion criteria, 363 cases were analysed from the hospital data and 330 cases were analysed from the mortuary data.

The inconsistent ratios of children injured by firearms versus children dying from firearm-related injuries can be explained by the difference of data sets. The information on children injured by firearms came from a data set which included 5 hospitals only (Red Cross Children's Hospital, Groote Schuur Hospital, Tygerberg Hospital, G.F. Jooste Hospital and Victoria Hospital). The mortality data are from a raw data set for the Western Cape Province collected by the National Injury Mortality Surveillance System. The entire mortuary data set consist of 6 056 firearm-related deaths among children and adults in the Western Cape, 370 of these cases involved children.

3.4 Instrument

Data were collected using similar "extraction sheets" which recorded all possible information from records at hospital and mortuaries. While hospital data were collected by the author and other research staff at the Children's Institute (CI),

mortuary data were collected by the MRC as part of their National Injury Mortality Surveillance Systems (NIMSS). NIMSS provided raw data for the purpose of this study.

3.4.1 Hospital data instrument

Hospital registers were reviewed for all gunshot wound (GSW) cases that fit inclusion criteria. If a case met the criteria, the folder was requested and data extraction was conducted with the use of an extraction sheet (see Appendix A). This sheet was adapted from the Red Cross Children's Hospital's trauma sheet (see Appendix B). All hospitals had a similar trauma sheet, which was convenient for extraction. The researchers extracted all the available information from the patient's folder and recorded it on the extraction sheet. The main categories of data extracted focused on demographics that included sex and age, and geographical location of the shooting. Medical information included the nature of the injury, where on the body the child was shot, and the date and time of injury.

3.4.2 Mortuary data instrument

NIMSS provides comprehensive data about deaths due to external causes. Data are collected from mortuaries to include all deaths due to external causes in order to contribute to the profile of non-natural mortality in men, women and children (Donson, 2008). Mortuary data was collected by the NIMSS using an extraction sheet (see Appendix C) similar to the one used by the Red Cross

Children's Hospital. This sheet includes sex, age, and geographical location of the shooting. However it does not include medical information such as parts of the anatomy injured.

3.5 Data collection

Hospital data were collected at five different sites identified in the Cape Metropolitan Area. Mortuary data were collected from the only two mortuaries in the Cape Town area.

3.6 Sites

All sites defined by the Department of Health and Social Services Provincial Administration of the Western Cape as health districts in the Cape Metropole were included. However the sample was extracted from five different hospitals in the Cape Metropolitan Area, who all agreed to participate in this study. All the major tertiary hospitals (Groote Schuur, Red Cross and Tygerberg) were included, and two secondary hospitals, Victoria and GF Jooste, were also included.

Each hospital is located in a different location in the Metropole and services a large proportion of the Cape metropolitan population. Brief descriptions of each hospital are provided below. It should be noted that Red Cross Children's hospital only treats children under the age of 13 years, and Groote Schuur only

patients from the age of 13 years onwards. All other hospitals described below treat children of all ages.

3.6.1 Red Cross War Memorial Children's Hospital

The Red Cross Children's Hospital (RXH), Cape Town, is the only independent Level 1 paediatric trauma unit in South Africa. It provides secondary care to the local population, and tertiary services to all hospitals in the Western Cape region (Van As et al., 2004). The hospital opened in 1956 as a dedicated and highly specialised children's health care facility. Children are referred to the institution from all nine provinces and from all over Africa to receive comprehensive specialist pediatric services. Red Cross is a referral hospital; this means that patients are referred from clinics and smaller hospitals before being admitted to the tertiary institution. The hospital has a staff complement of 1,100, ranging from academics, doctors and nurses, to professions allied to medicine, as well as clerical and non-professional staff (Cape Gateway, 2008).

3.6.2 Groote Schuur Hospital

Groote Schuur Hospital (GSH) forms part of the Western Cape Provincial Department of Health, and provides specialised and super-specialised care for patients. The institution is a world-renowned research hospital. It is known for being the hospital where the first heart transplant took place in 1967. This

hospital employs over 3,663 staff, who care for more than 560,000 referrals and in-patient admissions per year (Cape Gateway, 2008).

3.6.3 Tygerberg Hospital

Tygerberg Hospital is a tertiary hospital located in Parow, Cape Town. The hospital was officially opened in 1976 and is the largest hospital in the Western Cape, and the second largest hospital in South Africa. Cape Gateway (2008) states that it acts as a teaching hospital in conjunction with the Health Sciences faculties of the University of Cape Town and the University of Stellenbosch. During the normal working day there are about 10,000 people at the hospital, including staff, visitors and students. There are more than 4,000 people employed at the hospital.

3.6.4 Secondary hospitals

Two secondary hospitals were included in this study, selected on the basis of their proximity to areas identified in the literature and by experts as vulnerable to firearm-related injuries and deaths. Secondary hospitals play an important role in reflecting public health status, both locally and nationally. There are few studies that analyse the causes of secondary hospital admissions; which is unfortunate in the case of developing countries, considering the huge numbers of admissions and people at risk (Marszalek & De Villiers, 2006).

3.6.5 GF Jooste Hospital

GF Jooste operates in the Athlone Health District of the Cape Metropolitan region, and is located in Manenberg. In 1996, the emergency department was opened, with medical and surgical beds for adult patients only. Since then, it has been one of the busiest hospitals in the city. The hospital's patients are primarily from Mitchell's Plain, Philippi, Guguletu, Crossroads, Khayelitsha, Strandfontein, and Nyanga (Donson & Peden, 1999).

3.6.6 Victoria Hospital

Victoria hospital services a large proportion of the population in the South Peninsula Health District of the Cape Metropolitan region. It also operates a 24-hour trauma unit.

Table 3.1 presents the number and percentage of children treated at each of the five hospitals in this study. It should be borne in mind that this information was tabled after the inclusion criteria were applied.

Table 3.1 Percentage of children included in the study, per hospital site

Hospital	Number	%
Groote Schuur	149	41
Tygerberg	50	14
Red Cross	134	37
Victoria	9	2
GF Jooste	21	6
Total	363	100

Groote Schuur Hospital accounted for 41% of the total study sample followed by Red Cross Children's Hospital (37%), Tygerberg Hospital (14%), GF Jooste and Victoria Hospitals that accounted for 6% and 2% of the total study population respectively.

3.6.7 Salt River and Tygerberg mortuaries

Data collected at Salt River and Tygerberg mortuaries were extracted from the national data for 2001-2006 periods. These two mortuaries provide services to the Cape Metropole.

3.7 Extraction of data

All hospital data were extracted from hospital registers located in the trauma unit of each hospital. These registers contain the information of all patients that arrive at the trauma unit, usually presenting with serious injury or illness.

For Groote Schuur, Tygerberg and Red Cross Children's Hospital, all registers were accessed. However, this was not possible for Victoria and GF Jooste Hospitals, as some of the older registers had been destroyed. All registers consist of the patient's name, age, nature of the injury, the date of the incident, the time the patient was seen, the attending doctor's name and the folder number. All firearm-related incidents that involved children under the age of 18 were extracted and then patient folders were requested from the hospital's medical records facilities.

After a folder was located information was initially extracted from the trauma sheet (see Appendix B), and then additional information was gathered from nurses' reports and clinical notes.

NIMSS data were collected by police and forensic pathologists and then captured into computerised data system at the mortuary. These data are then sent to the Crime, Violence and Injury Lead Unit where data were cleaned and analysed by researchers (Donson, 2008). This study uses the clean raw data collected from the mortuaries. The data received were national data which includes all firearm-related deaths in South Africa between the periods of 2001-2006. After applying the inclusion criteria to the data, a clean dataset for gunshot amongst children was created.

3.8 Data analysis

Descriptive analysis of the data was conducted with the use of the Statistical Package for Social Scientists Version 16 (SPSS 16).

3.9 Policy Scan

A similar method employed by Abrahams (2006) was used in order to select the relevant laws and policies related to the findings of this study. This methodology relies on a holistic approach whereby all sectors of government are considered when ensuring the survival and development of children.

3.10 Ethical considerations

To ensure confidentiality of the patients, there was emphasis on ensuring that all ethics criteria were met as stipulated by both the university and the hospitals concerned. Patient and family anonymity was preserved throughout the research process. Each patient was allocated an individual identity number to ensure anonymity. Researchers accessing records entered contractual agreements to ensure that patient's information remained private and confidential, even after the study was complete.

The research protocol was submitted for clearance to the University of Cape Town's Faculty of Health Sciences Research Committee. Ethical clearance from relevant parties was obtained to gain access to information at the relevant sites. Once ethics clearance was received, the participating hospitals engaged in their

own ethics approval procedures (including Department of Health clearance) before any information could be accessed.

3.11 Conclusion

This chapter discussed the research process in terms of its methodology to extracting the data. The following chapter presents the results of the data collection.

University of Cape Town

CHAPTER 4

RESULTS SECTION 1

4.1 Introduction

The results presented in this chapter are based on the statistical analysis of hospital data, mortuary data and the policy and law scan conducted after the statistical analysis was achieved.

Due to ethical reasons patient names and numbers were not collected in both data sets, therefore samples could not be accurately matched. As such, potential overlap or duplication in these two samples could not be ruled out, making the samples statistically incomparable for the purposes of this study. It is for this reason that the data collected at hospitals will be used to investigate the firearm injury profile, and the mortuary data will explore the firearm fatalities profile.

The chapter is divided into four parts: firstly, an analysis of the entire hospital sample (N=363); secondly a sub-analysis in which a comparison is made between crossfire injuries (N=80) and other firearm-related injuries (N=71), thirdly an analysis of the entire mortuary sample (N=330), and lastly an outline of a policy and law scan with the aid of a case study.

The analysis is categorised into the variables that were discussed in Chapter 3. The analysis and the results presented are specific to this sample.

4.2 Demographic profile of firearm-related injuries

This section will present the results found at the hospitals visited. As previously mentioned, hospital data will be used to describe the firearm injury profile of children. The results will identify the location of where children were at the time of the shooting, both the geographical area and the actual place where the gunshot occurred. It also provides demographic information relating to race, age and sex. Finally the injury results indicate the part of the body injured.

4.2.1 Age

Age categories were created from the age variable that divided children in three different age groups: 0–5 years, 6–12 years and 13–17 years.

Table 4.1 describes the number and proportion of the age groups of the children shot between the periods of 2001–2006. It indicates that 62% of the children were between 13–17 years of age, followed by 6-12-year old, representing 27% of the sample size, and finally children between 0-5-years old, which constituted approximately 11% of the total sample.

Table 4.1 Number and proportion of firearm injuries by age group (N=363)

Age Group	Number	%
0–5 years	42	11
6–12 years	97	27
13–17 years	224	62
Total	363	100

Due to the relatively high prevalence of firearm-related injuries in the 13–17 year age group, the data are further desegregated to pinpoint the actual ages of the children. This is displayed in Table 4.2.

Table 4.2 Age distribution of children injured by firearms in the 13–17 year age group (N=224)

Age	Number	%
13 years	24	11
14 years	18	8
15 years	35	16
16 years	63	28
17 years	84	37
Total	224	100

These data suggest that the proportion of firearm-related injuries amongst children increases with age.

The age category was divided to create a bi-nominal variable of older and younger children. Younger children were grouped as 0-12-year olds, and the older children as 13-17-year olds. This could also be interpreted as teens and pre-teens. The data clearly indicate the disproportionate representation of older children in the sample of firearm-related injuries, with children over 13 years accounting for just over 60% of the total sample.

4.2.2 Sex

Table 4.3 depicts the number of girls and boys who presented with firearm-related injuries at the identified hospitals during the period 2001–2006. A large proportion of children who were shot were boys, amounting to 76% of the overall sample while girls accounted for 24% of the overall sample. Of all the cases presented in this study, 86 cases were girls and 277 cases were boys. Firearm injuries amongst boys therefore tested as significantly higher at a 95% confidence level than girls.

Table 4.3 Number and proportion of children injured by firearms, by Sex (N=363)

Sex	0–12 years	13–17 years	Total	%
Male	85	192	277	76
Female	54	32	86	24
Total	139	224	363	100

Table 4.3 shows that boys between 13–17 years represented the highest number of gunshots in the overall sample, accounting for 192 of the 363 cases. Younger girls between 0–12 years accounted for more of the firearm-related injuries than older girls.

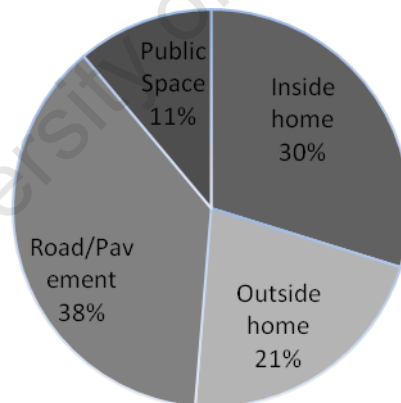
4.3 Scene of injury

The following results highlight the areas and specific places of gunshot occurrence, including geographic location where children were shot, during the

period 2001–2006. This information will provide insight into the exact locations where children are most vulnerable to be injured by firearms.

Figure 4.1 illustrates the physical locations where children were shot. These places were categorised as “inside the child’s home”, “outside the child’s home” (i.e. directly outside the home), the “road or pavement” and “public spaces” (e.g. spaza shops and shopping malls). Injuries that occurred in the road or pavement were recorded as one category at all hospitals; it is for this reason that they have been labeled as a single variable.

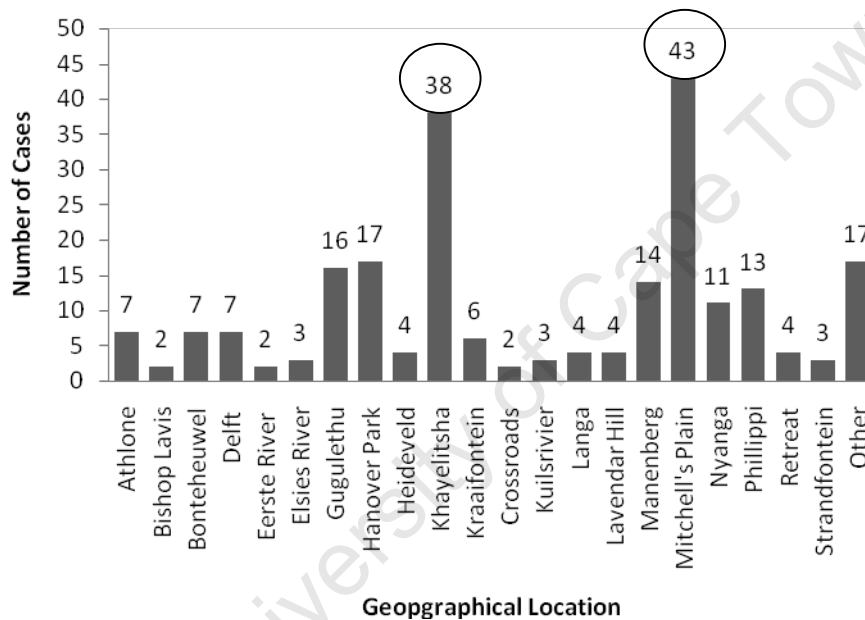
Figure 4.1 Proportion of children injured by firearms by place of occurrence (N=218)



”Outside home” refers to the area immediately outside the dwelling or residence (e.g. yard or garden), as opposed to the “road/pavement” which is outside the property. Public spaces include gunshot incidents that occurred inside places like shops. The chart shows that, of the 218 known cases, 38% of children were shot

either in the road or pavement, 30% of children were shot in their own homes, and 21% of children were shot outside their own homes. Eleven per cent of children were shot in other public spaces, which predominantly consisted of shops.

Figure 4.2 Number of children injured by firearms, by geographical location (N=227)



In 38% of the all the cases, geographical location was unknown. Figure 4.2 portrays the number of known cases by geographical location. Of the identified cases, 43 incidents of firearm-related injuries occurred in Mitchell's Plain, 38 incidents occurred in Khayelitsha, 17 incidents occurred in Hanover Park, 16 and 14 incidents occurred in Gugulethu and Manenberg respectively. When ranking

the top six geographical locations by year from highest to lowest it is obvious that Mitchell's Plain and Khayelitsha far outrank the other locations.

4.4 Time of Injury

The number of gunshot cases were analysed by days of the week. There was a significant difference in the occurrence of firearm-related injuries during the various days of the week. The peak days for firearm-related injuries were Sunday (19%) followed by Saturday (18%), and Monday (17%). Occurrences decreased during mid-week, with Tuesday and Wednesday accounting for 11% of gunshot cases each, and Thursday and Friday 12% each.

Table 4.4 illustrates the months for the period 2001–2006 in which firearm-related injuries to children were recorded at the surveyed hospitals.

Table 4.4 Number of recorded firearm-related injuries to children by month for the 2001–2006 period (N=363)

Year	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Total
2001	9	5	-	3	6	2	7	7	4	14	4	5	66
2002	5	10	6	5	11	5	6	10	8	3	6	16	91
2003	10	13	6	11	8	9	6	9	4	5	2	6	89
2004	2	1	1	1	6	4	4	7	6	5	4	3	44
2005	2	3	2	3	6	-	1	1	-	1	1	1	21
2006	6	2	2	-	1	4	9	4	9	3	5	7	52
Total	34	34	17	23	38	24	33	38	31	31	22	38	363

The peak months for the six years reviewed were as follows: 2001: January and October; 2002: May and December; 2003: February and April; 2004: May,

August and September, 2005: February April and May: and 2006: July and September. Data show a peak in 2002 and 2003, a decline in 2004 and 2005, and an increase in 2006 (the firearm-related injuries to children at the surveyed hospitals seemed to increase again). 2006 incidence is significantly higher than 2005 but is still significantly lower at a 95% confidence level than the peaks reached in 2002 and 2003. The cumulative data seem to indicate that there are 2 seasonal peaks of firearm related injuries in children during the summer and winter months.

4.5 Nature of the injury

Information about the body part injured was collected for all hospital cases in this study. An “other” code was given when the body part was not listed on the extraction sheet used. However, they were included in the variable of “main body part injured” that is divided into: head, thorax, abdomen/pelvis and limbs. Table 4.5 shows a detailed description of the body parts injured by gunshots amongst the cases from the surveyed hospitals. 96 (26%) children were shot in the legs, followed by other body parts (18%) accounting for 65 cases, and then arms (10%). The body parts in Table 4.5 were tabulated into four main body parts depicted in the pie chart (Figure 4.3).

Table 4.5 Frequency of body parts injured (n=363)

Body Part Injured	Frequency	Body Part Injured	Frequency
Scalp	8	Pelvis-spine	1
Brain-closed	2	Bowel	3
Brain-open	10	Liver	5
Eyes	9	Uterus	1
Nose	3	Perineum/buttock	23
Mouth	6	Bladder	2
Ear	3	Arms	37
Neck	7	Hands	17
Thorax-spine	1	Legs	96
Lungs	9	Foot	19
Abdominal wall	36	Other	65
		Total	363

Figure 4.3 Percentage of hospital records of children with gunshot injuries, by main body part injured, (N=363)

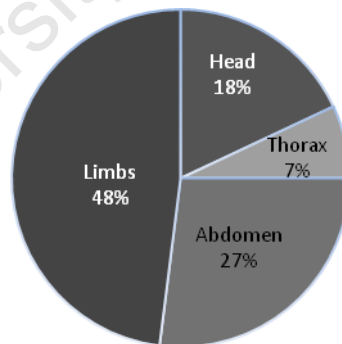


Figure 4.3 shows that nearly 50% of firearm-related injuries in this study occurred in the limbs (48%), followed by the abdominal/pelvic area (27%) and then the head (18%) and the thorax (7%).

4.6 Nature of the incident

Where possible, the nature of the incident was recorded. This information was captured to gain further information about why the child was shot, how and by whom. Figure 4.4 displays the information about the nature of the shooting.

Figure 4.4 Number of firearm-related injuries by nature of the shooting incident (N=363)

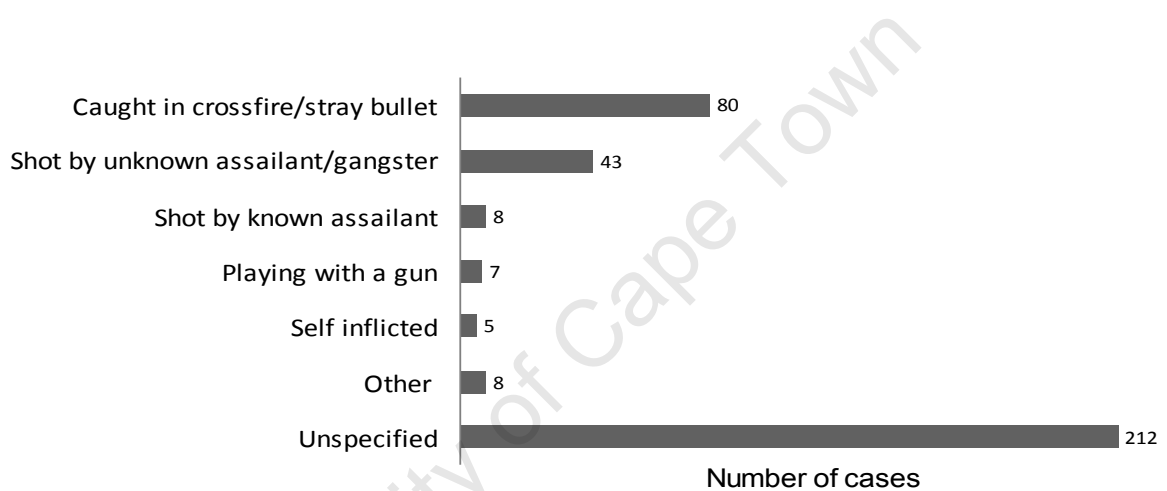


Figure 4.4 shows that, of the 363 cases analysed in this study, 212 medical folders did not state the circumstance surrounding the shooting incident, accounting for 58% of the total sample. Self-inflicted gunshots, firearm-related injuries by known assailants and playing with guns constituted less than 8% of the circumstances surrounding the shootings. The highest specified incidence occurred as a result of crossfire (80 of the cases) and being shot by an unknown assailant (43 of the cases); this variable included robbery.

4.7 Crossfire injuries vs. other firearm-related injuries

Crossfire incidents constituted nearly half of the recorded causes. For this reason a further sub-analysis was conducted on this variable in comparison to other causes of firearm-related injuries in children. Of the known causes (in only 48%) crossfire accounted for 80 cases and other firearm-related injuries accounted for 71 cases of the overall sub-sample. It remains a concern that the majority of causes of firearm-related injuries in children were not recorded in hospital folders.

4.8 Demographic profile of crossfire incidents

The demographic profile explores the age and sex of the children shot in crossfire. Similar to the total sample, binomial variables were created from the age variable that divided children in older and younger age categories. The demographic profile also identifies the location of where children were at the time of the shooting, which is divided into the geographical area where the incident occurred.

4.8.1 Age

The data show that of the 80 crossfire cases identified in the final research sample, the 6-12-year age group constituted 51% of the firearm-related injuries, 13-17-year olds accounted for 30% of the crossfire cases, while the lowest number of crossfire injuries were amongst the 0–5 year age category accounting

for 19% of the total number of crossfire cases. Of the 71 “other” (i.e. not crossfire) firearm-related injury cases identified, the 13–17 year age group constituted a staggering 65% of other injuries, 6-12-year olds accounted for 21%, and the lowest number of other injuries were amongst the 0–5 year age category, who constituted 14% of the total number of other firearm-related injuries. A larger proportion of younger children aged 6-12 years were shot in crossfire and more older children aged 13–17 were shot in other firearm-related injuries. Based on the indication that the 6–12 year age group was the most vulnerable to crossfire firearm-related injuries, a further desegregation of the survey data was applied to define the actual ages of the children in this group.

Table 4.6 Number and proportion of actual age of children in the 6-12-year age group injured by crossfire (N=41)

Age	Number	%
6 years	2	5
7 years	2	5
8 years	9	22
9 years	9	22
10 years	4	10
11 years	7	17
12 years	8	20
Total	41	100

Eight and nine-year-olds constituted a total of 44% of the 6-12-year age category. As seen in Table 4.6, 6-7 year olds account for a significantly lower proportion than the others in the age group. When the same disaggregation was

applied to older children, over two thirds of other firearm injuries were children aged 16 and 17, accounting for 28% and 38% of these age groups respectively.

Figure 4.5 Proportion of older and younger children shot in crossfire for the period 2001–2006

(a) Crossfire injures (N=80)

(b) Other injuries (N=71)



The age category was divided to create a bi-nominal variable of older and younger children, as was previously done with the entire hospital sample. Younger children were grouped as 0-12-year olds and the older children as 13-17-year olds. Figure 4.5 (a) clearly indicates that a substantial amount of younger children are caught in crossfire, accounting for 70% of the overall crossfire sample, with older children accounting for 30% of this group. Figure 4.5 (b) clearly indicates the direct opposite of Figure 4.5 (a) in that it shows that 65% of 13-17 years were involved in other firearm related injuries, and only 35% of 0-12 years.

4.8.2 Sex

A large proportion of children who were shot during crossfire were boys, amounting to 69% of the crossfire sample. Girls accounted for 31% of children shot in crossfire. Of all the cases of crossfire injuries in this study, 25 involved girls, and 55 were boys. A similar trend is evident for children involved in other firearm-related incidents, where boys accounted for 75% and girls constituted 25%.

In cases of crossfire, boys between 0–12 represented the highest number of firearm-related injuries, accounting for 37 of the 80 cases. Data also indicate that in the female category, younger girls between 0–12 accounted for more of the firearm-related injuries obtained in crossfire than older girls. On the other hand, in cases of other firearm-related injuries, boys between 13–17 years represented the highest number of firearm-related injuries accounting for 38 of the 71 cases. Data also show that in the female category younger girls between 0–12 accounted for slightly more of the firearm-related injury cases than older girls.

4.9 Scene of injury

This section identifies the areas in which crossfire and other injuries occurred. It highlights the specific place of gunshot occurrence, including geographic locations. This information will provide insight into the exact locations where children were shot while making the comparison between crossfire and other incidents.

Figure 4.6 illustrates the physical locations where children were shot. As explained previously, these places were divided into “inside the child’s home”, “outside the child’s home” (directly outside the home), the “road or pavement”, and “public spaces” (for example, shops).

Figure 4.6 Proportion of children injured in crossfire and other firearm-related incidents, by place of occurrence

(a) Crossfire injures (N=80)

(b) Other injuries (N=71)



Figure 4.6 (a) indicates that 33% of children were shot in crossfire either in the road or pavement, followed by 30% who were shot outside their own homes. Seventeen percent of children injured in crossfire were inside their own homes and 15% in other public spaces. In 5% of the crossfire cases the place of occurrence was unknown. Figure 4.6 (b) shows that 42% of other injuries occurred inside the child’s home, 20% occurred on the road/pavement, 20% were unknown, 10% occurred outside the home, and 8% occurred in a public space.

Figure 4.7 indicates the number of children shot in crossfire as per geographic location. Of all the crossfire cases in this study, Khayelitsha accounted for 14 incidents of all the cases (18%), followed by 12 cases in Mitchell's Plain (15%), followed by Hanover Park with 7 cases or 9% of all the crossfire injury cases.

Figure 4.7 Proportion of children injured in crossfire, by geographical location (N=80)

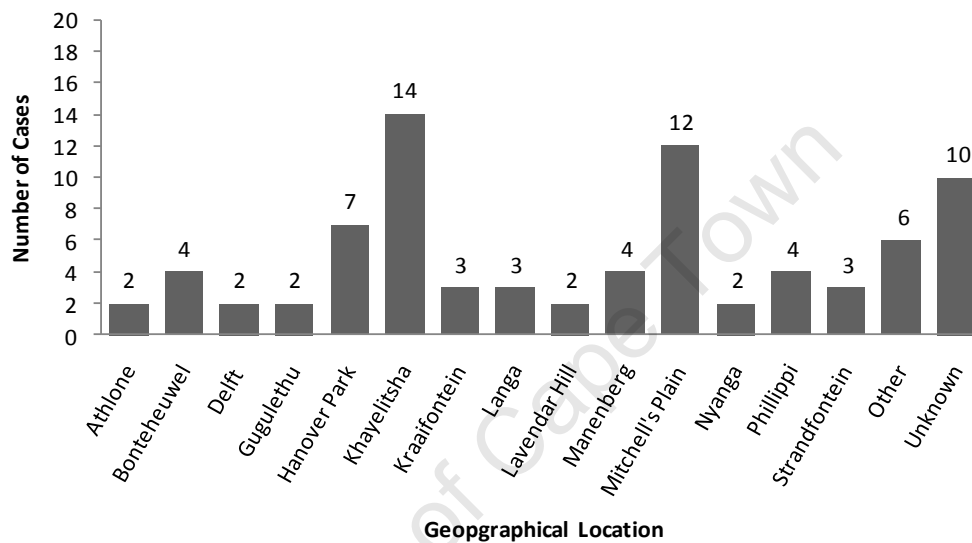


Figure 4.8 Proportion of children injured in “other” firearm-related incidents, by geographical location (N=71)

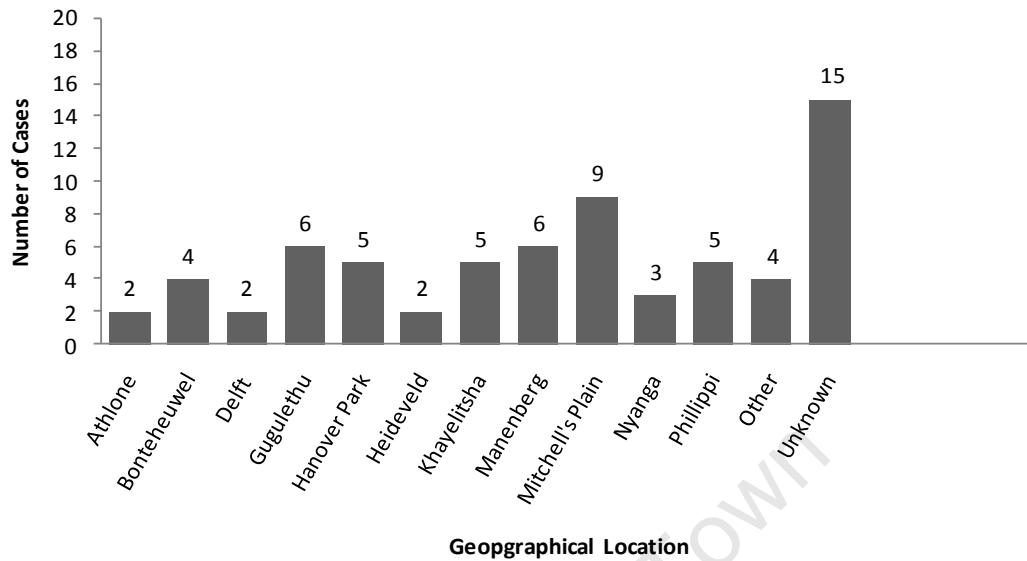


Figure 4.8 indicates the number of children shot in other firearm-related incidents as per geographic location. Nine incidents occurred in Mitchell’s Plain, followed by 6 incidents in Gugulethu and Manenberg respectively. Both crossfire and other firearm related cases appear to cluster in the same areas.

4.10 Time of injury

Time of injury will provide information on when children were caught in crossfire as well as involved in other firearm-related injuries in terms of the day, week and season.

The peak days for crossfire injuries in this study were Sundays, which accounted for 21% of firearm-related injuries to children, followed by Saturdays and Mondays, both at 19% each. Tuesday accounted for 14%, both Friday and

Thursday accounted for 11% each. The lowest number of crossfire injuries captured in this research sample occurred on a Wednesday, which amounted to 5% of the crossfire injuries sample.

Figure 4.9 presents a binomial variable that divides the week into weekdays and weekends. The weekdays include Monday, Tuesday, Wednesday, Thursday and Friday. Weekends include Saturdays and Sundays.

Figure 4.9 Percentage of children shot on weekdays vs. the weekend

(a) Crossfire injures (N=80)

(b) Other injuries (N=71)



Figure 4.9 (a) illustrates that 60% of crossfire injuries occurred during weekdays and 40% occurred over the weekend. Figure 4.9 (b) shows that 55% of other firearm-related injuries occurred over the weekend and 45% occurred on a weekday. There is a need to point out that there are more days in the week than the weekend, which could skew these results.

The results indicated that the peak month periods for crossfire injuries were May (13%). This was followed by July, August and November at 11% each. January

and October accounted for 10% each; February, March, April, June, September and December each accounted for less than 10%.

The highest number of crossfire injuries to children occurred in 2001 (23%), followed by 2002 (21%), 2003 (17%), 2004 (14%). 2005 accounted for the lowest percentage of crossfire injuries (9%) in this study. However, the steady decline that was evident over this five-year period changed in 2006, when crossfire injuries nearly doubled to 16% of the crossfire sample size, from the previous year's 9%.

4.11 Nature of the injury

As discussed earlier, data on the actual body part injured was collected in all cases in this study. This variable was also explored for crossfire-related cases. As previously explained, an "other" variable label was used when the body part was not listed on the extraction sheet used. However, they were included in the variable of "main body part injured" that is divided into: head, thorax, abdomen/pelvis and limbs.

Figure 4.10-Percentage of main body parts injured (N=80)

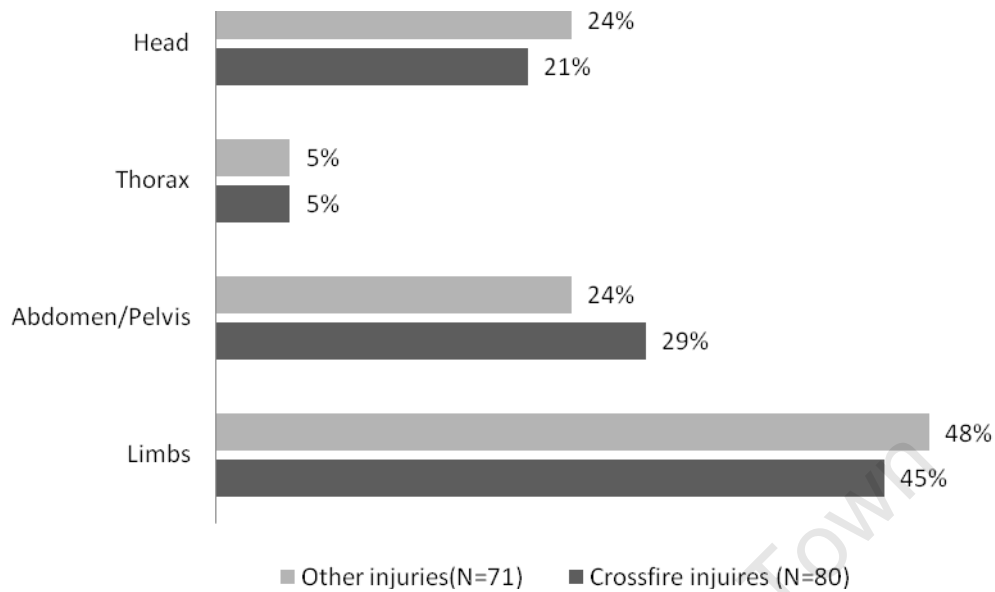


Figure 4.10 shows that for both crossfire and other firearm-related injuries nearly 50% of children were shot in the limbs. For crossfire injuries this was followed by the adnominal/pelvic area (29%), followed by head (21%) and thorax (5%) injuries. This percentage distribution was almost identical for other firearm related injuries. For other firearm-related injuries, limb injuries was followed by the adnominal/pelvic area (24%), followed by gunshots to the head (24%) and the thorax (4%).

RESULTS SECTION 2

4.12 Deaths as a result of firearm injury

The results presented in this section describe data acquired by the Medical Research Council as part of their National Injury Mortality Surveillance Systems (NIMSS). The data on firearm-related deaths were collected with the use of a data sheet (Appendix C) designed by the MRC. This data sheet collects similar demographic information to that of the Red Cross Children's hospital data form.

4.13 Demographic profile of firearm related deaths

On a national level, 39 898 firearm-related deaths were seen at South African mortuaries between 2001 and 2006. Of these deaths 1166 were children, the majority of which occurred in Gauteng (36%) followed by the Western Cape (constituting 28% of the national sample). Of the deaths seen nationally, Black and Coloured children accounted for 71% and 16% of the total number of firearm related deaths respectively. The national data indicate that 24% of children are shot in their homes or yards, followed by roads and pavements. The mortuary data seen on a national level echoes the findings seen in injury data discussed earlier. On a provincial level in the Western Cape a similar picture can be seen supporting the results reported for the Cape Metropolitan injury profile described earlier. Through the application of the inclusion criteria the final sample of deaths for the Cape Metropolitan area amounted to 330 cases.

This section will present the results found at the Cape Town mortuaries. As previously mentioned, mortuary data will be used to describe the firearm death profile of children. Similar to the injury section, the results will identify the location of where children were at the time of the shooting, both the geographical area and the actual place where the gunshot occurred. It also provides demographic information relating to race, age and sex.

4.14 Age

The data show that in the Cape Metropolitan area the mean age of a child who died from a gunshot injury was 14.39 years. This fact supports the findings that older children are more likely to be involved in firearm related incidents. Older children between 13-17 years of age constitute 82% of all children who died, whereas younger children between 0-5 years and 6-12 years accounted for eight and ten percent of this population respectively. Table 4.7 depicts a cross tabulation between age groups and the year in which the deaths occurred. It shows a recurring trend of older children dying of firearm related injuries throughout the 6 year period reviewed in this study. Furthermore, at a 95% confidence level older children's death by gunshot was significantly higher than younger children.

Table 4.7 Number of firearm fatalities, by age group (N=330)

Age group	Year of Death						Total
	2001	2002	2003	2004	2005	2006	
0–5 years	2	2	4	2	5	6	21
6–12 years	8	7	10	4	3	2	34
13–17 years	43	63	57	33	51	28	275
Total	53	72	71	39	59	36	330

4.15 Sex

The literature and injury data collected indicate that older boys are most vulnerable to be injured or killed by firearms. This is reiterated by the number of gunshot related deaths reported between 2001 and 2006. Of 330 death cases males accounted for 82% (235 cases) and females accounted for 12% (40 cases) of the total sample. This translates into 4 male deaths for every single female firearm-related death. It should be noted that, similar to the trend seen for boys, deaths amongst girls between 13-17 years of age are significantly higher than younger girls. While there was no significant difference seen for younger males and females under age of six, male deaths between 6-12 years were significantly higher than girls of that age group.

4.16 Scene of injury and nature of the incident

This section will explore places and geographical areas where gunshots occurred as well as nature of the incident that describes the circumstance that resulted in a firearm-related death. Of 330 cases, the actual place where the injury occurred was only known for 86 (26%) of all firearm-related incidents. Of the known cases, 63% of the firearm-related injuries that resulted in death occurred at home or in the yard; this was followed roads or streets, which accounted for 22% of places where gunshots occurred. This finding is supported by the evidence collected at the hospitals. Geographical areas most vulnerable to gunshot incidents were Khayelitsha, Gugulethu and Mitchells Plain. These data are similar to data reflected on earlier when discussing injuries.

Ninety-five percent of all firearm injuries that resulted in death were due to homicide, 4% of the cases were deemed as suicide, and accidents accounted for only 1% of the sample. While it was not clear from the hospital data of the types of incidents that resulted in deaths, this shows definitively the main cause of firearm-related death is homicide.

RESULTS SECTION 3

4.17 Law and Policy Results

As mentioned in objective 3, relevant policies and legislation were identified based on the findings of this study. In order to contextualise the findings, a case study (Box 1) was drafted, based on the results presented in this chapter. The maximum survival and development model by Dutschke and Abrahams (2006) is specifically targeted at children. This model is ideal in that it aids the process of identifying rights violations, duty-bearers and duties in cases where children's right to maximum survival and development is threatened. Three main pieces of legislation have been consulted to determine what rights are violated in an incident where a child sustains a firearm-related injury or dies. The United Nation Convention on the Rights of the Child (1989), the African Charter on the Rights and Welfare of the Child (1990) and the South African Constitution (1996) were used to identify the relevant rights.

Box 1- A case study

Max, aged 13, was playing on the pavement outside his home on the Cape Flats. Suddenly he heard a familiar, loud bang in the distance. Within seconds Max was laying on the ground. A stray bullet had pierced his leg and exited just above his kneecap. Max was rushed to a trauma unit nearby. Months later, Max was back at hospital for a check-up. He was now using crutches and was having nightmares of being shot.

Table 4.8 extracts facts from the case study to illustrate the rights violations that took place.

Table 4.8 Identification of constitutional rights violations, duty-bearers and duties

Facts	Rights violation		Duty-bearer	Duties
Max being shot	<p>The right to freedom and security of the person [Section 12], to be free of all forms of violence from either public or private sources [Section 12 (1)(c)]</p> <p>The right to be protected from maltreatment, neglect, abuse or degradation [Section 28(d)]</p>	<p>Section 10: Everyone has inherent dignity and the right to have their dignity respected and protected.</p> <p>Section 11: Everyone has the right to life.</p> <p>Section 28(c): The child's best interests shall be of paramount</p>	<ul style="list-style-type: none"> ▪ Department of Safety and Security ▪ South African Police Services ▪ Parent or caregiver 	<p>Ensure all neighbourhoods have areas where children can play safely.</p> <p>Police could patrol areas where high incidents of violence occur.</p>
Violence in the community and being shot in the road or on the pavement	<p>Right to have access to adequate housing (adequacy includes areas where children can play in order to develop) [Section 26(1)]</p> <p>Right to an environment which is not harmful to health or well-being [Section 24(1)]</p>			<ul style="list-style-type: none"> ▪ South African Police Services ▪ Department of Housing ▪ Department of Public Works ▪ Department of Sport and Recreation

The rights identified in Table 4.8, provides a snapshot of the rights that are violated in cases of firearm-related injury or death. It uses facts from the case study to illustrate constitutional and international rights violated and looks at the duty bearers responsible for ensuring that these rights are enforced. Over and above the violated rights identified here, there are many rights that need to be respected, protected and fulfilled. Max was taken to the hospital trauma unit after he was shot. He had the right not to be refused emergency medical treatment

[Section 27(3)]. As a child he also has the right to basic health care services [Section 28 (1) (c)]. Max and his family require ongoing psychological counselling, not only for the incident, but to teach them to cope with Max's disability. Based on some of the duty-bearers highlighted in Table 4.8, the following laws, policies and programmes and their implementation should be considered in relation to the relevant governmental department.

Department of Health

Laws

- National Health Act, No. 61 2003
- Medicines and Related Substances Control Amendment Act, No. 90 1997

Policies

- Free primary health care for all
- Free health care for people with disabilities

Programmes

- National Adolescent-Friendly Clinic Initiative

Department of Social Development

Laws

- Children's Act 38 Of 2005

Policies

- Prevention and Protection of Abuse and Neglect policy

Programmes

- None could be identified

Department of Education

Laws

- South African Schools Act 84 of 1996
- National Education Policy Act 27 of 1996
- Education Laws Amendment Act 31 of 2007

Policies

- Regulations for Safety Measures at Public Schools

Programmes

- Safer Schools Initiative

Department of Safety and Security

Laws

- South African Police Services Act 68 of 1995
- Firearms Control Act 60 of 2000

Policies

- All schools are gun free zones
- Programmes

- Integrated Crime-Prevention Road Policing Strategy

4.18 Conclusion

The law and policy scan should be seen as a starting point for policy and decision-makers to identify their role as duty-bearers. The statistical results presented in this chapter will be discussed in Chapter 5. It will highlight the key results and will ultimately inform the recommendations in Chapter 6.

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CHAPTER 5

DISCUSSION

5.1 Introduction

This chapter provides discussion of the results derived from the mortuary and hospital data reviewed in Chapter 4. The ecological model for understanding violence and literature discussed in Chapter 2 will be used as a frame of reference to interpret the findings. This chapter focuses on the vulnerability of boys, nature and time of the incidents, and the main body parts injured.

5.2 Vulnerability of Boys

The demographic profile explored the age and sex of the children injured by firearms. Binomial variables were created from the age variable that divided children in older and younger age categories. Boys in the 13-17-year age group accounted for the largest proportion of gunshot injuries of all the children in this study. Wigton (1998) expressed a similar trend that males and females constituted 85% and 15% respectively of the total firearm-related injuries in the Cape Metropolitan Area. In International studies, like those conducted by Gabriel et al (2004), where older children were not included, boys still constituted the highest number of firearm injuries.

A significant finding from the sub-analysis indicated that, in cases of crossfire, 0-12-year old boys and girls represented the highest number of gunshot incidents. The opposite was true for children involved in other firearm-related injuries where gunshot wounds among older boys aged 13-17 were more prevalent.

These findings are particularly important as it highlights a group of children that seem to be consistently vulnerable in incidents of violence. In a study on school violence in South Africa, Burton (2008), further highlights boys' vulnerability by stating that boys at secondary school level are more likely to be assaulted, threatened or robbed than girls. However, it should be noted that while older boys are most vulnerable on an overall level, older girls between 13-17 years of age appear to be the most vulnerable amongst girls.

The WHO model for understanding violence states that the innermost circle represents the biological and personal history that each individual brings to his or her behaviour in relationships (Garcio-Moreno et al. 2005). Part of this personal and biological history is gender. Lindsay and Miescher (2003) points out that Africa is an important site for studying the social construction of gender, since some scholars have argued that African gender identities have been particularly fluid and contentious, heavily articulated with wealth, age, seniority, and ritual authority. Further insight into gender identity and specifically masculinity may provide reasons why older boys are seemingly more involved in firearm-related violence than girls.

5.3 Gunshots in the community

The third circle of the ecological model represents the institutions and social structures, both formal and informal, in which relationships are embedded. This

could refer to a neighbourhood, workplace, social networks and peer groups (Garcio-Moreno et al., 2004). The results highlighted the areas and specific places of gunshot occurrence, including geographic location where children were shot, in the period under review. These data provided insight into the exact locations where instances of firearm-related injuries to children took place. The largest proportions of children in the research sample were shot either in the road or on the pavement, or in their own homes. This finding is supported by previous studies that indicated that most firearm-related injuries and fatalities occur in private homes or on pavements close to home (Matzopolous, 2005; Wigton, 1999; Van As et al., 2004).

Khayelitsha and Mitchell's Plain were the two areas where most of the gunshots in this study occurred. In a report commissioned by the Department of Provincial and Local Government (2006), it was noted that Khayelitsha was more populous than Mitchell's Plain and was growing at a rapid rate due to high levels of migration. The report added that Khayelitsha is affected by higher levels of poverty and unemployment. Furthermore, the Khayelitsha area was characterised by a concentration of informal settlement in its northern and peripheral areas, where levels of poverty and access to basic services were more problematic.

Certain areas of Mitchell's Plain, although on a far less significant scale, reflected similar characteristics of informality, with socio-economic indicators reflecting the most problematic conditions in the South-East of the area and in pockets of informal settlement to the North (Department of Provincial and Local

Government, 2006). The issues of high population density and poverty identified by the department's assessment could relate to the high incidence of gunshots amongst children in those areas identified in this study. The areas highlighted in both the hospital and mortuary data are correlated with the high proportion of Coloured and Black children being shot. The areas mentioned are historically populated by Coloured and Black people since the Group Areas Act of 1950.

5.4 Nature of the incident

Information about the body parts injured by firearms was collected in all cases from the hospital database. Data were divided into four main body parts injured: head, thorax, abdomen/pelvis and limbs. In the research sample, most of the injuries were limb injuries, particularly leg injuries. These types of injuries require constant care and depending on the extent of the injury add financial strain to State hospitals and parents. Many of the children with leg injuries required orthopedic surgery and physiotherapy.

Where possible, the nature of the incident was recorded to gain further information about why the child was shot and to determine how and by whom. Most of the hospital folders of examined cases did not record the circumstance surrounding the gunshot incident (58%) as data collected in the health service in most instances do not record details on the crime itself. An analysis of police records would have provided better insight into this.

In cases where the nature of the incident was recorded (only 42%) most of the injuries occurred as a result of crossfire. Self-inflicted gunshots constituted the smallest percentage of gunshots amongst the examined cases of firearm-related injuries to children. The high number of crossfire incidents may provide insight into the intent of the gunshot. It is therefore likely that the children shot were not the intended victim.

Due to the high prevalence of homicidal deaths (95%) it is useful to reflect on issues around gang-related violence which may be a contributing factor to homicidal deaths. Frank (2005) states that key factors in the formulation of gangs are poverty and unemployment. Assuming that gang related violence is a cause for crossfire incidents, then it is likely that perpetrators are young males. This was highlighted by Frank (2005) whose study confirms that boys are more usually part of gangs than girls.

5.5 Time of injury

The results identified the day, week and season of the injury in an effort to provide insight into the time of year and day of the week that children could be more vulnerable to firearm-related injury or death. Most hospitals recorded the actual time of arrival and not the time that the incident occurred. It was for this reason that it was not included in this study. Results showed that weekend days (patients arriving at the hospital on Saturdays, Sundays and Mondays) had a significantly higher number of gun-related injuries to children. This indicates that

most injuries do not occur during school days. This concurs with the fact that most gunshots occur at home or in the road when children are not at school.

The month of May was found to be a peak month for firearm-related injuries to children in the sub-analysis of crossfire cases. The lowest number of firearm-related injuries in the research sample occurred in March. Mortuary data did not however appear to project any peak months, showing no significant peak in the number of firearm-related deaths in any given month.

The hospital data indicated a peak in 2001 and 2002, a decline in 2004 and 2005, and then an increase of nearly 10% of gunshots incidents amongst children in the research sample in 2006. Meel (2005) also highlights a similar trend in his study in the Eastern Cape, with a peak in 2001 and a gradual decline thereafter. Interesting to note is that in 2004 and 2005 when the instances of gun injuries to children in the sample decreased, advocacy activities on a new Firearms Control Act were taking place, and in 2005, a gun amnesty campaign was taking place nationwide.

5.6 Conclusion

The results discussed in this chapter are considered to be key findings in this study. The main findings indicated that older boys were generally more exposed to firearm-related injuries. Khayelitsha and Mitchell's Plain were identified as areas with the highest incidence of gunshots. Injuries presented at hospitals were

mostly limb injuries. Nearly all firearm-related deaths were related to homicide. These findings will inform the recommendations provided in Chapter 6.

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CHAPTER 6

RECOMMENDATIONS

6.1 Introduction

The recommendations in this chapter are meant to guide the process of achieving and realising the rights of children, and to help ensure that they live in a safe and protected environment.

South Africa's gun control legislation can be considered as relatively strict. However the implementation of the Firearms Control Act should be followed through by implementing awareness campaigns and education at school level.

This study demonstrated a decline in the instances of firearm-related injuries to children treated at selected Cape Metropolitan hospitals in 2005. Campaigns for gun amnesty may be a factor in this decrease. The Department of Education's *Safer Schools* initiative promotes violence-free schools and highlights that all schools are *gun free zones*. Barbarin et al. (2007) recommend that schools can play a significant role by incorporating modules in the curriculum that promote favourable self-appraisal and enhance children's capacity for self-reflection and coping skills. These skills can be implemented outside of the school environment where most of the gunshot injuries occur.

6.2 Specific recommendations from this study: for Policy, and Governmental Departments

Since higher levels of gunshots in children occur over weekend days, SAPS should patrol in the identified areas particularly over weekends when firearm-related injuries often occur. They could also provide added support to existing neighbourhood watches.

Compulsory reporting of patients presenting to either State or Private Hospitals with a firearm-related injury to the South African Police Service will assist in monitoring gunshots. Reporting these gunshots to the national police is already common practice in a number of European countries.

6.3 Recommendations for health-care providers

Because of the higher number of firearm-related injuries in children, this study stresses the importance for health care providers to be adequately trained in the management of gunshot wounds

6.4 Recommendations for the development of information systems

As there are very few documented studies on firearm injuries in children, there is an urgent need for comprehensive information systems, particularly recording reliable injury surveillance data. Examples are specific causes of firearm related mortality. SAPS (South African Police Services), along with the Department of

Health, should record all incidents of violent injuries that are presented at hospitals, to help with the tracking of information on such occurrences in an attempt to generate an up-to-date database that can be used to monitor incidents of violence and perpetrators.

The largest proportion of the sample was derived from Groote Schuur Hospital and Red Cross Children's Hospital. This results from a variety of causes, ranging from the number of patients seen at these institutions to the availability of information. Red Cross Children's Hospital was the only hospital that had an actual database dedicated to recording information of the patient and the nature of the injury. The database is managed and maintained by Childsafe South Africa. Another computerised database available at hospital was Clinicom; however this database is predominantly used to track patients' financial accounts. This database could be updated to include the type of information collected in this study, which would make it a rich source of data for researchers, health professionals, policy-makers and other stakeholders.

6.5 Further research

Unfortunately, there is a paucity of data on firearm-related injuries in children. The only data available are from review studies, and are likely to provide biased and incomplete information. We therefore strongly recommend the initiation of studies regarding firearm-related injuries in children. Additionally, the number of deaths amongst children could be extracted from mortuary data or from the SAPS for analysis to provide insight into the causes and circumstances of child

deaths. An area of particular interest is firearm-related injuries in boys. Research in this aspect may provide empirical evidence on why they are seemingly more vulnerable, not only to firearm-related injuries, but to injuries associated with violence. Research should be conducted in all provinces to provide a broader overview of the firearm-related injuries and deaths amongst children.

6.6 Limitations

This study involves children who are both injured and children who died as a result of firearms. The ratio of children injured by firearms and children dying from firearm-related injuries can be explained by the difference of data sets collected from mortuaries and hospitals. All information on children injured by firearms came from a data set which included 5 hospitals only (Red Cross Children's Hospital, Groote Schuur Hospital, Tygerberg Hospital, G.F. Jooste Hospital and Victoria Hospital) while there are approximately 40 hospitals in the Western Cape. Obviously this is a small sample, but unfortunately no other information was available.

Additionally, the 4 hospitals from which clinical data were gathered all have inadequate administration, and an unknown number of patient folders may have gone missing.

This study predominantly focussed on urban areas, it did not include firearm injuries from rural areas. Including a rural sample may be more reflective of the population. While data were collected from all major tertiary hospitals and

mortuaries, it cannot be assumed that all children who are shot are taken to public hospitals.

6.7 Conclusion

The Constitution of South Africa states that everyone has the right to freedom and security of the person, and the right to be free from all forms of violence from public or private sources. These rights are violated when a child is harmed in his or her community. A child's best interests are of paramount importance in every matter concerning the child. The main findings of this study were that mostly older boys from the research sample were injured and killed by firearms, and that mostly younger children were injured in crossfire. Khayelitsha and Mitchell's Plain were found to be areas where the highest incidents of firearm-related injuries to children occurred. The injuries presented at surveyed hospitals were mostly limb (and particularly leg) injuries. The number of firearm-related injuries and deaths amongst children decreased between 2001 and 2005 and in 2006. As firearm-related injuries are preventable, relevant interventions may be implemented towards decreasing incidents of firearm-related injuries and fatalities. Finally, when a child's rights are violated by violence in the public or private sphere, a range of duty-bearers can be identified who have the responsibility to ensure that children are safe and protected from any form of violence. The insurance of child safety ensures South Africa's future.

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APPENDICES

Appendix A



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Firearm-related injuries and fatalities among children in the Cape Metropolitan Area 2001-2006

HOSPITAL DATA SHEET

Fieldworker name		Fieldwork Checked	Manager
Site Supervisor		Date	

Hospital

Groote Schuur	01	Khayelitsha	12
Tygerberg	02	Mitchell's Plain	13
Red Cross	03	Citipark	14
Somerset	04	Constaniaberg	15
Victoria	05	Durbanville	16
False Bay	06	Gatesville	17
Conradie	07	Milnerton Mediclinic	18
Wesfleur	08	2 Military	19
Hanover Park	09	N1 City	20
Hottentots Holland	10	Wynberg	21
Elsies River	11	Other (specify):	22

Sex

Male	01	Female	02
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Race

Black	01
Coloured	02
Indian	03
White	04
Unspecified	05
Other (please specify):	06

***Date of Birth**

d	d	M	m	Y	Y	y	y	d

*** Date of injury**

D	d	m	m	y	y	y	y

Time admitted

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Time injured

Subtract the number listed on the trauma record in "hours since accident"

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Place

Indicate where the firearm injury occurred using the following categories:

Inside own home	01	School/crèche	06
Outside own home	02	Public space	07
Inside other home	03	Sport	08
Outside other home	04	Other (specify):	09
Road/pavement	05	Unknown	99

Major area name

Indicate the area in which the injury occurred as follows:

Athlone	01	Delft	13	Kalksfontein	25	Milnerton	37	Ravensmead	49	Sutherland	62
Atlantis	02	Durbanville	14	Kensington	26	Mitchell's Plain	38	Retreat	50	Tableview	63
Bellville	03	Eerste River	15	Khayelitsha	27	Muizenberg	39	Robertson	51	Uitsig	64
Bellville-South	04	Elsies River	16	Kraaifontein	28	Nooitgedacht	40	Rondebosch	52	Valhalla Park	65
Bishop Lavis	05	Factreton	17	Crossroads	29	Nyanga	41	Saldanha	53	Vredendal North	66
Blakenberg	06	Fish Hoek	18	Kuilsriver	30	Ocean View	42	Sarepta	54	Vredenburg	67
Belhar	07	Goodwood	19	Langa	31	Onbekend	43	Scottsdene	55	Wetton	68
Blackheath	08	Grassy Park	20	Lavender Hill	32	Ottery	44	Simonstown	56	Worcester	69
Blue Downs	09	Gugulethu	21	Lotus River	33	Paarl	45	Sir Lowry's Pass	57	Woodstock	70
Bonteheuwel	10	Hanover Park	22	Macassar	34	Philippi	46	Somerset West	58	Unknown	99
Clanwilliam	11	Heideveld	23	Maitland	35	Philadelphia	47	Springbok	60	Other Specify: 71	
De Doorns	12	Hout Bay	24	Manenberg	36	Pinelands	48	Strand	61		

Admission

Indicate whether the child was:

Not admitted	01	Admitted to trauma unit	02	Admitted directly to other ward or ICU	03
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Disposal

Where was the child sent after the trauma unit?

Absconded	01	Ward	06
Home/GP	02	Burns unit	07
Day hospital	03	ICU	08
Other hospital	04	Childcare agencies	09
Outpatients	05	Died	10

State of patient on arrival

Consciousness	Yes	No	Unknown
Was the child unconscious when he/she arrived in trauma?	01	02	99
Shock	Yes	No	Unknown
Was the child in shock when he/she arrived in trauma?	01	02	99
Resuscitation	Yes	No	Unknown
Did the child require resuscitation when he/she arrived in trauma?	01	02	99
Anaesthetic	Yes	No	Unknown
Did the child require anaesthesia when he/she arrived in trauma?	01	02	99
Self inflicted injury	Yes	No	Unknown
Was the child's injury self inflicted?	01	02	99

Number of gun shots

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Body/anatomical area

Which part of the child’s anatomy was injured by the firearm?

Head		Thorax		Abdomen		Pelvis		Limbs	
Scalp	01	Spine	09	Spine	12	Spine	18	Arms	22
Brain-closed	02	Heart	10	Bowel	13	Uterus	19	Hand s	23
Brain-open	03	Lungs	11	Liver	14	Perineum/ buttock	20	Legs	24
Eye(s)	04			Kidneys	15	Bladder	21	Foot	25
Nose	05			Spleen	16				
Mouth	06			Abdominal Wall	17				
Ear	07								
Neck	08								

If other, please specify:

	27
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Pathology

None	01	Joint injury-closed	13
Concussion	02	Joint injury-open	14
Abrasions	03	Fracture-pathol	15
Closed tissue	04	Fracture-closed	16
Laceration – superfic.	05	Fracture-open	17
Laceration – complic.	06	Fracture dislocation	18
Avulsion/amputation	07	Foreign body – projectile/bullet point	19
Burns	08	Pneumothorax	20
Vascular injury	09	Haemothorax	21
Nerve injury	10	Haemopneumothora	22
Muscle/tendon injury	11	CSA no injury	23
Dislocation	12	CSA injury present	24

If other, please specify:

	25
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Abbreviated Injury Score (AIS)

Indicate the child's Abbreviated Injury Score (AIS):

Minor	01	Moderate	02
Severe	03	Mortal	04

Treatment

Indicate the treatment given to the child:

Advice/medication/HIF	01	EUA/MUA	05
Dressings/simple POP	02	Open operation	06
Clean and suture	03	Amputation	07
Observation/traction	04	Skin graft	08

If other, please specify:

	09
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Intentionality

If possible, indicate whether or not it is known whether the injury was intentional or unintentional

Intentional	01	Unintentional	02	Cannot be determined	03
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Nature of the incident

If possible, indicate the nature of the incident

Additional notes and/ information about this case:

Appendix C

NIMSS DATA COLLECTION FORM

Mortuary _____ **Police No.** _____ **Officer collecting body (Surname)** _____

PM no. _____ **PM Date** **Pathologist (Surname)** _____

Date & Time of Injury **Race** **Sex**

Date & Time of Death **Age**

Medical treatment of injury prior to death (check only ONE) 1 None 2 Emergency care at scene 3 Hospital care

Province of injury (may differ to province of death) **Scene of injury (may differ to scene of death)**

1 Gauteng	7 Mpumalanga	1 Private house & yard (inc. pool)	9 Medical service area
2 W. Cape	8 Northern Province	2 Residential institute	10 Industrial & construction area, mine
3 K.Z. Natal	9 North West	18 Informal settlement/squatter camp	11 Farm, primary production area
4 E. Cape	10 Unknown	3 Bar, shebeen, N'Club, disco	12 Sea, lake, river, dam
5 N. Cape	11 Other (specify) _____	4 Amusement park, sports area	13 Open land, beach
6 Free State		5 Road/street/highway	14 Countryside
		6 Railway track, station	15 In custody, prison
		7 Shop, bank, retail area	16 Place unknown
		8 School, educational area	17 Other (specify) _____

Town of injury _____
Suburb or district _____
Closest police station to injury scene _____

External Cause or Circumstance of Injury

1 Firearm Discharge	9 Fall/push/jump from height	17 Motor vehicle Driver	24 Abandoned baby
2 Sharp Object	10 Other fall/push/jump	18 Motor vehicle Unspecified	25 Electrocution
3 Blunt Object	11 Crushing	19 Railway casualty	26 Explosive blast
4 Strangulation, suffocation, asphyxia	12 Choking, aspiration	20 Bicycle, motor cycle	27 Natural cause
5 Hanging	13 Drowning, immersion	30 Aviation casualty	28 Unknown
6 Poisoning, ingestion	14 Lightning	21 Medical Procedure	29 Other Specific Cause
7 Poisoning, gassing	15 Motor vehicle Pedestrian	22 Sudden Infant Death	
8 Burn	16 Motor vehicle Passenger	23 Abortion, still birth	

Apparent Manner of Death

1 Homicide 2 Suicide 3 Accident 4 Natural 5 Undetermined

Samples Taken (check all)

1 None 2 Blood 3 Tissue 4 Other fluid

Alcohol and Other Substances (for completion by surveillance consortium staff)

Blood Alcohol Level **Eye Fluid Alcohol** **Other Substances (Specify)** _____

For completion following court investigation: homicides and suicides only

Type of Intentional Violence		Perpetrator – Victim Relationship			
1 Interpersonal	6 Rape, Sexual	1 Spouse, Partner	5 Friend	9 Unknown	
2 Self Directed	7 Child Abuse	2 Parent	6 Official/Legal Authority	10 Other Specified Person(s)	
3 Legal Intervention	9 Unknown	3 Other relative	7 Stranger		
4 Gang, Syndicate	8 Other (specify) _____	4 Unrelated Caregiver	8 Acquaintance		
5 War/civil Insurrection					

Context of Violent Attack (Code from court record) _____

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