Firearm fatalities in the Transkei region of South Africa, 1993 - 2004

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Background. Firearms are a causative factor in much violence-related morbidity and mortality, including suicide. Interventions focus on stricter gun control. In South Africa multisectoral collaboration is needed in this regard.

Objective. To determine the incidence of firearm-related deaths in the Transkei region and to understand the underlying causative factors.

Method. A record review was undertaken of 10 860 medicolegal autopsies performed between 1993 and 2004 at Umtata General Hospital.

Results. Between 1993 and 2004 10 860 autopsies were performed on patients who died as a result of trauma and other causes at Umtata General Hospital. The average number of gunshot related-deaths during this period was 48.4 per 100 000 of the population per year. The rate increased from 27/100 000 in 1993 to 42/100 000 in 2004. Firearm-related deaths accounted for 29% of all traumatic deaths, and males (82%) outnumbered females 4.6:1, although there is an increasing incidence among females. About 50% of these deaths were in the 21 - 40-year age group. Interpersonal violence, poverty, and use of drugs and alcohol were common underlying factors.

Conclusion. There is a high incidence of firearm-related deaths in Transkei. Stricter gun control is required.

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Injuries are a leading cause of death in all age groups and in both sexes. Violence and injuries accounted for 9% of global mortality and 12% of all disability-adjusted life-years (DALYs) lost in 2002.[1] It is estimated that 5.8 million people worldwide die each year as a result of some form of injury.[2] Firearm-related violence is not new in South Africa. According to a United Nations survey of 69 countries,[3] South Africa has one of the highest firearm-related homicide rates in the world, second only to Columbia. Police figures indicate that firearms are increasingly being used as murder weapons.[4]

According to the World Health Organization (WHO),[5] Japan recorded a firearm homicide rate of less than 0.1/100 000 in 1997. In the same year a firearm homicide rate of 40/100 000 was reported in Brazil, and a rate of 50/100 000 in Columbia. Global burden of violent death in low- and middle-income countries (42.2/100 000 persons) is more than double that in high-income countries (17.3/100 000 persons).[5] In South Africa, police figures indicate that firearms are increasingly being used in murders, with rates of 42% in 1994 and 49% in 1999.[4] The City of Cape Town reported a firearm homicide rate of 40.4/100 000 people per year for 1999.[6] A recently published study[7] showed that the average annual incidence of violent and/or traumatic death in Transkei was 162/100 000. At 43/100 000 of the population per year, firearm-related deaths have contributed substantially to this high incidence.[7] In South Africa more than 32 murders are committed per day. In the Witwatersrand area the figure is almost 10 per day. This is twice the average murder rate of New York City. An estimated 70 000 South Africans are killed as a result of trauma every year, with a further 3.5 million seeking health care following trauma (Crisp and Ntuli[8] and L Vogelman, keynote address to the Annual General Meeting of the National Institute for Crime Prevention and Reintegration of Offenders, 1990). A study by Van der Spuy[9] has shown that violence is a major factor in South African trauma, accounting for 34.3% of all trauma cases and 53.2% of trauma fatalities in the Cape metropole. The USA is generally regarded as a relatively violent society with an average annual death rate of 10.1/100 000 population. Over the same period (1993 - 1996) South Africa had annual violent death tolls 5.5 times higher than the US figure.[9]

The highest homicide rates among males and females occurred in the 15 - 44-year age group.[5] Worldwide, suicide claimed the lives of nearly 1 million people in 1998. Approximately 60% of all suicides among males, and over half (53%) of all suicides occurred among persons between the ages of 15 and 44 years. Thirty per cent of male suicide and 13% of female suicide cases involved use of a firearm.[5] There are an estimated 11 - 13 million firearms in South Africa; 4 million are legally owned, 5 million belong to the South African National Defence Force and Police Service, and 1 - 4 million are illegally owned.[10] Of the 29 694 guns stolen in 1998, only 1 764 (6%) were recovered in that year;[4] the rest, by definition, fell into the hands of criminals. The number of guns is increasing annually in South Africa, with the Central Firearms Register receiving about 18 000 - 20 000 new applications monthly. Every day more than 30 people die of gunshot wounds and many more are injured.[4]

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Although far more research is needed to estimate the economic cost of gun violence in South Africa, one study at Groote Schuur Hospital in Cape Town looked at how much the hospital spent on treating the almost 1 000 firearm-injured patients who presented there in 1993. It was calculated that the treatment of these injured patients cost the hospital nearly R4 million. These are direct medical costs, which only account for an estimated 13% of the total costs of gun violence – the composite cost for these patients was calculated as approximately R30 million.[9] This is for one year for one hospital only. A survey undertaken by the Human Sciences Research Council showed that stricter gun legislation is overwhelmingly supported, with 84% of South Africans indicating that they want stricter gun control.[11] The gun control bill that is being debated in the South African Parliament is a step in the right direction.

The purpose of this study was to determine the incidence of firearm-related deaths and to understand the underlying factors in Transkei.

Method

A retrospective descriptive study was undertaken, reviewing traumatic deaths at Umtata General Hospital (UGH) for the period January 1993 - December 2004. All the medicolegal autopsies were recorded in the postmortem register at the hospital mortuary. Recorded details included the names, addresses and ages of the deceased, together with cause of death. The referrals were mainly from the Umtata and Nqgeleni magisterial districts (combined population of 400 000). The few referrals from nearby magisterial districts (e.g. Qumbu, Mqanduli, Libode, etc.) were excluded from the study. All the autopsy records for the specified period were reviewed, compiled and collated manually. An analysis of 12 years' records was also carried out manually, and then using a computer, the results were presented in table and graphic form.

Results

There were 10 860 medicolegal autopsies performed during the 12-year period 1993 - 2004 at Umtata General Hospital. Trauma accounted for 73% of all deaths. Death as a result of trauma decreased from 82% in 1993 to 74% in 2004, while the rate of non-traumatic deaths increased from 18% to 26% in same year (Table I). The mean annual rate of traumatic death was 165/100 000 population, and of non-traumatic death 62/100 000. There was an increase in the number of traumatic deaths from 155/100 000 in 1993 to 169/100 000 in 2004, while the number of non-traumatic deaths rose from 35/100 000 in 1993 to 59/100 000 in 2004 (Table II).

The pattern of injuries was as follows: motor vehicle accidents (MVAs) 35%, firearm injuries 29%, stab wounds 21%, and blunt injuries 15% (Table III). The mean firearm fatalities (48.4/100 000) were the leading cause of homicide in the population, followed by deaths caused by stabbing (33.2/100 000), and blunt injuries resulting from assaults (23.7/100 000). Firearm-related deaths increased from 27/100 000 in 1993 to 42/100 000 in 2004 (Table IV). Males (82%) outnumbered females 4.6:1 in terms of firearms fatalities (Figs 1 and 2). Young adults in their most productive years, i.e. 21 - 40, accounted for almost half of the traumatic deaths (Fig. 3).

Table I. Traumatic v. non-traumatic deaths in Transkei, 1993 - 2004 (*N* = 10 860)

Year	Traumatic deaths (*N* (%))	Non-traumatic deaths (*N* (%))	Total deaths (*N*)
1993	622 (82)	140 (18)	762
1994	592 (73)	223 (27)	815
1995	548 (72)	218 (28)	766
1996	634 (77)	186 (23)	820
1997	767 (77)	231 (23)	998
1998	684 (66)	361 (34)	1 045
1999	678 (69)	297 (31)	975
2000	669 (71)	279 (29)	948
2001	647 (73)	242 (27)	889
2002	664 (73)	243 (27)	907
2003	727 (70)	299 (30)	1 026
2004	675 (74)	234 (26)	909
Mean	659 (73)	246 (27)	1 086

Table II. Number of traumatic v. non-traumatic deaths per 100 000 population in Transkei, 1993 - 2004 (N = 10 860)

Year	Traumatic deaths (/100 000)	Non-traumatic deaths (/100 000)	Total deaths (/100 000)
1993	155	35	190
1994	148	56	204
1995	137	55	192
1996	158	47	205
1997	192	58	250
1998	171	90	261
1999	170	74	244
2000	167	70	237
2001	162	61	223
2002	166	61	242
2003	182	75	257
2004	169	59	228
Mean	165	62	227

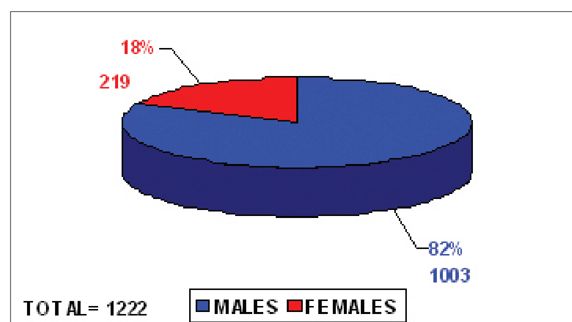

Fig. 1. Male v. female firearm fatalities in Transkei, 1993 - 1999 (N = 1 222).

Table III. Pattern of traumatic deaths in Transkei, 1993 - 2004 (*N* = 10 860)

Year	MVAs (*N* (%))	Firearm (*N* (%))	Stab injuries (*N* (%))	Blunt trauma (*N* (%))	Total (*N* (%))
1993	248 (39)	107 (18)	167 (27)	100 (16)	622
1994	260 (43)	140 (24)	110 (19)	82 (14)	592
1995	224 (41)	117 (22)	103 (18)	104 (19)	548
1996	271 (42)	153 (24)	111 (18)	99 (16)	634
1997	319 (42)	229 (30)	117 (15)	102 (13)	767
1998	261 (38)	201 (30)	132 (19)	90 (13)	684
1999	193 (30)	250 (36)	142 (20)	93 (14)	678
2000	203 (30)	237 (36)	140 (21)	89 (13)	669
2001	168 (26)	271 (42)	117 (18)	91 (14)	647
2002	203 (31)	237 (36)	140 (21)	84 (13)	664
2003	249 (35)	212 (29)	154 (21)	112 (15)	727
2004	241 (36)	168 (26)	161 (24)	95 (14)	665
Mean	237 (35)	194 (29%)	133 (21)	95 (15)	658

MVAs = motor vehicle accidents.

less than R1 500 per month, and 41% of households have a monthly income of less than R500 per month (Eastern Cape Development Summit, Rural Development Framework Document, October 2000). Many legal and illegal firearms were smuggled into South Africa towards the end of the apartheid regime.[12] The culture of gun-owning is still very prevalent in our society. Owning a gun is not a problem, but irresponsible use is the problem. Very few studies have been done on firearm-related deaths in South Africa, despite the fact that shooting is the leading cause of non-natural deaths.[13]

Table IV. Firearm, stab and blunt object fatalities per 100 000 population in Transkei, 1993 - 2004 (*N* = 10 860)

Year	Firearm fatalities	Stab fatalities	Blunt object fatalities	Total homicide fatalities
1993	26.7	41.7	25	93
1994	35	27.5	20.5	83
1995	29.2	25.7	26	81
1996	38.2	27.7	24.7	91
1997	57.2	29.2	25.2	112
1998	50.2	33.2	22.5	106
1999	62.5	35.5	23.2	121
2000	59.3	35	22.2	117
2001	67.8	29.2	22.7	120
2002	59.2	35	21	115
2003	53	38.5	28	120
2004	42	40.2	23.7	106
Mean	48.4	33.2	23.7	105

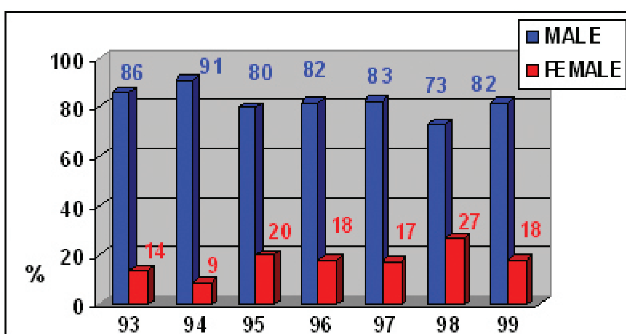

Fig. 2. Male v. female firearm fatalities in Transkei, 1993 - 1999 (N = 1 222).

Discussion

Transkei is a former homeland, and is now part of the Eastern Cape province. This province is one of the poorest in the country. Almost three-quarters of the population (74%) earn

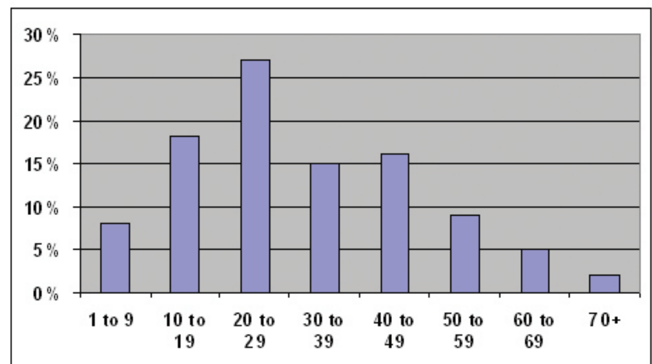

Fig. 3. Traumatic deaths in the different age groups in Transkei, 1999 (N = 274).

Trauma (73%) is a leading cause of death in the Transkei region (Table I). The rate of violent death varies according to a country's income level. In 2000, the rate of violent death in low- to middle-income countries was 32.1/100 000 population, more than twice the rate in high-income countries (14.4/ 100 000).[14] The average violent death rate in this study (165/ 100 000) is at least 5 times higher than in low- to middle-income countries, and at least 11 times that of high-income countries (Table II). South Africa is both a First- and a Third-World country. At one end of the spectrum people are very prosperous as in high-income countries, and at other end they are very poor. However even in the wealthy areas of South Africa firearm mortality nearly tripled from 3.8/100 000 in 1992 to 10.3/100 000 in 1996.[15] This study found that in the same period (1993 - 1996) firearm-related deaths increased from 26.7/100 000 population in 1993 to 38.2/100 000 in 1996 (Table IV). The City of Cape Town reported a firearm homicide rate of 40.4/100 000 person-years for 1999.[6] In the same year, in Transkei the average firearm homicide rate was 62.5/100 000 person-years (Table IV). This indicates clearly that the firearm homicide rate is at least 50% higher in Transkei than Cape Town. In South Africa, the rate and pattern of violent crime

varies between cities and regions. The majority of historically black areas like Transkei have high levels of firearm-related crime.

Levels of violence tend to be highest in countries with the fewest resources and with the least capacity to prevent and treat injury.[16] The high level of poverty and low levels of education and employment in Transkei could be responsible for this high violence. A recent study (2004) in the Transkei region showed that individuals with a low level of education and low employment status were more vulnerable with regard to violence and trauma-related deaths.[17] The poor and weak are at a high risk for injury because they are faced with hazardous situations on a daily basis. The poor also have less chance of survival when injured because they have reduced access to health services. Unfortunately it is projected that the violence-related disease burden will increase by 2020.[18] Statistics from developed countries indicate that for every person who dies as a result of injury, around 30 times as many people are hospitalised and 300 times as many people are treated in hospital emergency rooms and then released.[2] A recent study[19] has shown a very high pre-hospital mortality rate among trauma patients in the Transkei region (74%). The study recommended employing more medical personnel in the rural areas and introducing an effective ambulance service.[17]

The fourth annual report of the National Injury Mortality Surveillance System (NIMSS)[20] covering the period 1 January - 31 December 2002 described 25 494 fatal injuries registered at 34 mortuaries in 6 provinces. Estimates for the total number of non-natural fatalities in South Africa range between 70 000 and 80 000 annually. According to the NIMSS, firearms were the leading cause of fatal injury in all age groups from 15 to 65 years.[20] In the present 12-year study (1993 - 2004), there were a total of 10 860 fatalities. Of these deaths, 7 927 (73%) were related to trauma. It is a rough estimate that for every 70 non-natural deaths in South Africa 1 is from the Transkei region, although only only 1 in every 100 South Africans lives in this region. The observed rate of violent and/or traumatic deaths in Transkei from 1993 to 1999 is 2.4 times higher than in Cape Town.[7] The present study found that 65% of non-natural deaths in Transkei were homicides, compared with 46% in the NIMSS report. Firearms contributed significantly (29%) to these homicides (Table III), slightly more so than in the NIMSS report (27.8%). The proportion of firearm deaths has decreased from 2001, when it reached a peak of 42% of all traumatic deaths, but it is still an unacceptably high figure (Table III). The reason for this decrease is not known but better policing, positive hope for employment, and food security may be contributory factors. Although MVAs are still the major concern, accounting for 35% of all traumatic deaths, firearm fatalities are of more concern to the community (Table III).

South Africa is both a First- and a Third-World country and has a population of about 41 million, of whom 76% are black. The Eastern Cape has a population of 7 million (17% of the population of South Africa). This province contributes 7.5% to the country's GDP but is characterised by a gross lack of infrastructure and limited commercial facilities. In fact the Eastern Cape has the highest percentage of poor people in South Africa (24%), and this figure rises to 92% in former Transkei (Unitra, Faculty Executive Committee, 2003). There is increasing tolerance toward and collective amnesia with regard to violence, which has resulted in 50 and 80% of the victims receiving medical treatment without reporting the incident to the police.[19] In Transkei the poor are at greatest risk, both as victims and as perpetrators. This may be one of the reasons for the limited response to violence as a public health and public advocacy issue. This neglect needs to be addressed – police, health and transport services are required in this area comparable to those in the rest of the country.

The proportion of firearm injuries in Transkei increased from 18% in 1993 to 26% in 2004 (Table III). This study found that women are under increasing threat as the number of firearm fatalities among women increased from 14% in 1993 to 27% in 1998. On average 4 males are killed for each female firearm-related homicide (Figs 1 and 2). The majority of victims (80%) are young male subjects between 15 and 49 years of age (Fig. 3). An earlier study[21] also showed that there is an increasing trend of female traumatic deaths, especially related to firearms. The figures in this study are also in line with WHO data. In 1998 the WHO reported approximately 736 000 homicides worldwide from all causes, including firearms. Males accounted for nearly 80% of all homicide victims. The highest number of male and female homicide victims were aged 15 - 44 years. With the exception of the youngest age group (0 - 14 years), male homicide rates were approximately 3 - 6 times higher than female homicide rates across each of the various age groups. The high rate of male homicide in the 15 - 44-year age group is largely because of high levels of interpersonal violence among young males.[2] Violent traumatic death among women in South Africa has been described as endemic, in the sense that it is 'widespread, common and deeply entrenched'.[22] Active steps must be taken by the government to curb this trend. Recent moves to introduce gun control are therefore a necessary step in the strategy to reduce violent crime.

Worldwide, suicide claimed the lives of nearly 1 million people in 1998.[2] Approximately 60% of all suicides occurred among males, and over half (53%) of all suicides occurred among persons (male and female) between the ages of 15 and 44 years. However suicide rates are generally higher among males than females.[2] The number of suicides was difficult to estimate in this study, but a recent circumstantial study[23] showed that there has been a one and half times increase in the rate of suicide deaths (e.g. hanging), and in deaths from gunshot injuries (which may or may not be suicides). HIV/AIDS is known to have a significant association with

suicide. Early studies suggested that suicide risk was 20 - 36 times higher in HIV-infected persons than in the general population, but more recent trends in the USA show a decline. This is not true in Africa, including Transkei.[24]

The introduction of a gun control bill in South Africa is aimed at stricter and more efficient gun ownership laws.[25] Violence has traditionally been seen as the domain of the law enforcement and criminal justice systems. For this reason, societies have largely responded to the problem of violence with strategies of repression or containment. The role of the health sector has generally been limited to treatment and disability prevention – in other words to 'damage control'. The bill is a decisive step to achieve reduced mortality and disability. If the number of gun-related deaths decreases, the enormous financial savings could be invested in the welfare of the community.

In conclusion, the incidence of firearm deaths is declining, but is still a major cause of concern in the Transkei region. The victims are often the poor and the weak in society. It is increasingly clear that government and civil society have an important role to play in the implementation of effective gun control.

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References

1. Krug E. Injuries and violence prevention. *Message of Support. Summary Annual Report 2003*. Medical Research Council, South Africa.
2. World Health Organization. *Injury Surveillance Guidelines (1998 - 2000)*. Geneva: WHO, 2001: 1-80.
3. United Nations. Economic and Social Council, Commission on Crime Prevention and Criminal Justice. International Study on Firearms Regulations, 7th session, Vienna, 21-30 April 1998. **http://www.cybershooters.org/firearm** (last accessed 30 August 2005).
4. Gun Control Alliance. Gun related deaths and injuries. Statistics on gun violence in South Africa, 2005. **http://www.sacc-ct.org.za/statistics.html** (last accessed 11 November 2005).
5. World Health Organization. *Small Arms and Global Health*, 2001. Geneva: WHO, 2001.
6. Prinsloo M, Matzopoulos R, Bopape J. Firearm fatalities in the Cape Metropolitan area in 1999. *Trauma Review* 2000, **8:** 5-7.
7. Meel BL. Incidence and patterns of violent and/or traumatic deaths between 1993 and 1999 in Transkei region of South Africa. *J Trauma* 2004; **57**(1): 125-129.
8. Crisp N, Ntuli A. Trauma and injury. In: *Health Review*. Durban: Health Systems Trust, 1999.
9. Van der Spuy JW. South African trauma data: some perspectives for planning. *Trauma and Emergency Medicine* 1996; **13:** 7-10.
10. National Crime Prevention Strategy. Illegal firearms in South Africa. Nedbank ISS. *Crime Index* 1999; **3**(2): 7.
11. Gun Control Alliance. Majority of South Africans support stricter gun control, Feb 2000. **http://www.gca.org.za/pressreleases/releases/gfsa.15022000.htm** (last accessed 11 November 2005).
12. Cable News Network (CNN). Upper house approves stringent new gun control bill for South Africa, 2000. **http://archives.cnn.com/2000/WORLD/Africa/10/12/safrica** (last accessed 12 October 2005).
13. Smith T. Shooting leading cause of non-natural deaths. *Cape Argus* 2003; 29 December.
14. World Health Organization. *World Report on Violence, 2002*. Geneva: WHO, 2002.
15. Wigton A. Firearm-related injuries and deaths among children and adolescents in Cape Town 1992 - 1996. *S Afr Med J* 1999: **89:** 407-410.
16. Centers for Disease Control and World Health Organization. *Injury Surveillance Guidelines* (1998 - 2001), 2001: 1-46.
17. Meel BL. Pre-hospital and hospital traumatic deaths in the former homeland of Transkei, South Africa. *Journal of Clinical Forensic Medicine* 2004; **11:** 6-11.
18. World Health Organization. *Non-communicable Diseases, Mental Health and Injuries*, 2002. Geneva: WHO, 2002: 1-21.
19. Kruger J, Butchart A, Seedat M, Gilchrist A. A public health approach to violence prevention in South Africa. In: van Eeden R, Wentzel M, eds. *The Dynamics of Aggression and Violence in South Africa*. Pretoria: Human Sciences Research Council, 1998: 399-424.
20. Medical Research Council. *National Injury Mortality Surveillance System (NIMSS)*. Cape Town: MRC, 2002.
21. Meel BL. Gender related traumatic deaths in Transkei: Incidence and causes. *Med Sci Law* 2003; **43:** 215-220.
22. Vogelman L, Eagle G. Overcoming endemic violence against women in South Africa. *Social Justice* 1991; **18**(1-2): 209-229.
23. Meel BL. Suicide and HIV/AIDS in the Transkei, South Africa. *Anil Aggrawal's Internet Journal of Forensic Medicine and Toxicology* 2003; **4**(1): 1-11. Published 26 May 2003. **http://anil298.tripod.com/vol_004no_001/papers/html** (last accessed 11 November 2005).
24. Meel BL, Leenaars AA. Human immunodeficiency virus (HIV) and suicide in a region of Eastern Province ('Transkei'), South Africa. *Archives of Suicide Research* 2005; **9**(1): 69-75.
25. Parliament Report. Gun Control Bill B-34. Public hearings for gun free South Africa. South African Safety and Security Minister (Steve Tshwete) **http://www.courttv.com/archive/world/southfricas** (last accessed 23 August 2005).