

**Life expectancy of South African adolescents with and without
interpersonal violence as a cause of death, 2001-2010**

Nicole De Wet

Demography and Population Studies, University of the Witwatersrand,
Johannesburg, South Africa

Abstract

Interpersonal violence has historically been a feature of South African society. With roots in the country's politically turbulent past, the legacy of interpersonal violence persists with public media frequently reporting on both major and minor occurrences of violence resulting in mortality. Despite the entire population being affected, interpersonal violence is a particularly challenging issue for adolescents whose health and survival will affect the country's future social and economic progression. Death Notification Forms from 2001-2010 are analysed. Conventional and associated – single decrement life tables are used. The sample size is 18,085,744 adolescent deaths from 2001-2010. Results show that male deaths from interpersonal violence are higher than female deaths throughout the period. Older adolescents have higher rates of mortality due to interpersonal violence than younger ones at 0.76% and 11.40% respectively. Interpersonal violence accounts for almost 5% of all adolescent deaths in recent years. Males can gain about 8 extra years of life if interpersonal violence is 'deleted' and adolescent females can gain about 7 additional years. Policies bearing in mind these age and sex differentials in mind will assist in reducing fatalities among adolescents.

Introduction

Violence, of many forms, is present in Sub-Saharan Africa and elsewhere in the world. The consequences of violence include physical injury or death, emotional trauma such as living with fear or social anxiety, social disturbance for example the disruption of families and communities and financial such as the costs of medical care and costs of losing an economically active family member. In many Sub-Saharan African countries, measures to address large-scale population violence, such as wars and genocide, as well as violence between small groups of people, such as gender-based violence and domestic violence, have been put into place. One notable measure is the Violence Prevention Alliance (VPA) for the Global Campaign for Violence Prevention (GCVP) which aims to increase capacity for violence prevention at individual and institutional levels and improve the delivery of services for victims and perpetrators globally by 2020 (VPA 2011).

There are many different types of violence. Among the forms of physical violence are self-directed (self-mutilation or suicide), collective and interpersonal violence (Krug, Dahlberg, et al. 2002; WHO 2002). Collective violence refers to social, political or economic violence. These acts are done to advance a particular agenda, such as terrorism, war or the disruption of access to basic government services (Udosen et al. 2006). Interpersonal violence, however, refers to violence between individuals, regardless of relationship. These forms of violence include child abuse, domestic violence, and acts of

physical assault, rape or sexual assault. In this paper interpersonal violence is measured by assault as a cause of death.

Levels and determinants of assault vary across the world. In high-income countries, the rate of deaths due to assault is reportedly, 14.4 deaths per 100,000 population while in low-income countries this rate is 32.1 deaths per 100,000 population (Krug, Mercy, et al. 2002). Within these broad rates however, there are further regional disparities by type of assault (physical or sexual) and sex. Research on physical assaults show gender disparities with males in the US having a rate of 700 non-fatal assaults per 100,000 population compared to females with a rate of 461 per 100,000 population (CDC 2014). Similarly in South Africa, 80% of unnatural causes of death, including violence and transport fatalities, were among males (Donson 2008). In addition, it was found that this an age differential regarding unnatural causes of death with one study reporting that deaths increased from 47% at age 10 to 81% at age 18 in the US (Mulye et al. 2009). In South Africa results on assault as a cause of death found that adults (15-49 years) experienced higher percentages of physical assault than children (0-14 years old) at 13.8% and 1.7% respectively (Statistics SA 2014) . Literature on sexual assault has found higher rates among females than males, however, the under-reporting of male sexual assault has been noted (Kimerling et al. 2002; Wong & Van de Schoot 2011). Further regional disparities exist regarding levels of female sexual assault with prevalence rates in South Africa being as high as 30% compared to 18.3% in the US (CDC 2012; Watt et al. 2014).

Violence in South Africa has been notably researched for its political significance in the country's history. However, in modern democratic South

Africa, issues of violence persist and are highly publicized in the country. Acts of violence against foreign nationals living in the country were a main feature in news headlines in 2008 and more recently the protest violence which resulted in 47 deaths at the Marikana mine in 2012 have also raised national and international awareness (Neocosmos 2008; Sorensen 2012). Matters of interpersonal violence in South Africa are equally high with the murder rate in 2013/14 being 32.2 per 100 000, up from 31.1 in 2012/13 (ISS 2014). Similarly, sexual assault statistics in the country are among the highest in the world with more than 30% of girls having been raped before the age of 18 (Gould, Burger & Newham 2014).

Theories and ideas about why violence in South Africa persists at this magnitude have been formulated. Some argue that the country's politically turbulent past has fostered a culture of violence, whereby violence is seen to be an expression of social frustration (Hamber 1998; Harris 2003; Lau 2009; Simpson, Mokwena & Segal 1992). Others argue that violence is exacerbated by current social and financial conditions whereby gendered norms and traditions as well as high unemployment are the determinants of such behavior (Neocosmos 2008; Seedat et al. 2009). Regardless of reason however, the consequences of violence are dire and warrant more attention (Dhaffala et al. 2014). For interpersonal violence, psychological trauma, injury and mortality are all associated with physical assault and sexual assault (Campbell 2002; Kaminer et al. 2008; Karunakara et al. 2004). Furthermore victims, families and communities are affected by the injury or death of a relative resulting from interpersonal violence. For example, research has found that the families of rape victims also experience stress and anxiety disorders (Ahrens & Campbell

2000; Campbell & Wasco 2005) . With the consequences affecting more than just victims, interpersonal violence, like disease, is a public health issue. Medical practioners, social workers, parents, governments and community leaders all have a vested interest therefore in the reduction of interpersonal violence particularly among youth who are most affected.

In South Africa, youth, including adolescents (10-19 years old) are known to be both victims and perpetrators of interpersonal violence. Literature has found that 184 per 100,00 youth males (15- 29 years old) are perpetrators of homicide in the country (Norman, Matzopoulos, et al. 2007). In addition, 32.7% of youth and adults in the country believe that crime is increasing (Statistics SA 2012). Interpersonal violence in the country accounts for about 6% of all deaths annually (Norman, Bradshaw, et al. 2007). However, adolescents and youth remain a key demographic to the country's future development, provided they survive to adulthood. With this in mind this paper aims to examine the extent to which life expectancy can be enhanced if interpersonal violence were eliminated as a cause of death among adolescents in South Africa.

Data and Methods

The data for the present study are from the Death Notification Forms for 2001 to 2010. The South African General Household Survey data are used for population estimates in the life tables. The variable for interpersonal violence is derived from the Death Notification Forms. The International Classification of Causes of Death (ICD-10) has various codes for unnatural or non-disease causes of death. Among these are the codes for assault-related causes of death. In this study, broad-underlying causes of death attributed to assault (ICD-10 code: X85- Y09) are identified as interpersonal violence causes coded as '1',

all other deaths, both from disease and non-disease causes are the censor group of the analysis (0). Assault is defined as deaths that result from homicide and/or injuries inflicted by another person with intent to injure or kill, by any means (AAPC 2011). The definition however, does not include injuries due to legal intervention, operations of war or terrorism (AAPC 2011). This is therefore, an appropriate measure of interpersonal violence. The total sample size for interpersonal causes of death among adolescents is 18,085,744 deaths from 2001-2010.

The limitations of Death Notification are notably, under-reporting and misclassification of causes of death. Under-reporting of deaths in rural areas and among children are particularly problematic in South Africa (Dorrington et al. 2001). Further, misclassification has been noted to arise from errors in the diagnosis, statistical coding and data processing of the forms (Sulaiman 2003). While these limitations are true of vital registration records in many developing countries, South Africa has made concerted effort over the years to minimize these problems and recent reports show data completeness for adults deaths at 90%, however, the registration of childhood deaths (under the age of 15 years) remains lower than that (Dorrington et al. 2001; Timaeus et al. 2002).

Life table techniques are used (Namboodiri & Suchindran 1987; Preston, Heuveline & Guillot 2001). Life table analysis is based on the principle of competing risk. This principle explains that while all people are exposed to the risk of dying there are competing causes which will lead to death, for example cancer or road accidents. Further, the principle suggests that each cause is mutually exclusive and exhaustive. So based on this premise, there is one cause of death that is not related to others and is the main cause from which people

die. In adopting this approach of competing risk, life table analysis is suitable for quantifying the contribution of certain causes of death to the overall mortality experience of adolescents. Further this approach enables the inference of what gains could be made in the number of adolescents who will survive to 85+ years and life expectancy should interpersonal violence be eliminated from the population.

Multiple and associated single decrement life tables are generated for the population of South Africa in two time periods, 2001-2005 and 2006-2010. The purpose of these life tables is to illustrate the life expectancy (e_x) for the adolescent population should interpersonal violence be eliminated from the population. To show differences between the sexes, these are generated for males and females separately. These tables are thus fundamental to policy-makers in generating specific policy and programmes to address the country's development indicators.

In constructing the life tables, the conventional approaches to derive ${}_nq_x$, ${}_nd_x$, l_x , ${}_nL_x$, ${}_nT_x$ and e_x have been used (Preston, Heuveline & Guillot 2001). However, the ${}_na_x$ function, which is the mean number of person- years lived in the interval has been based on Chiang's approach for ages older than 5 years old (Chiang 1984). For ages under 5 years old, the Coale and Demney approach has been used (Coale & Demeny 1983). For the decrement process, probability of dying from a cause (${}_nq_x^i$) has been derived as follows:

$${}_nq_x^i = {}_nq_x ({}_nD_x^i / {}_nD_x)$$

Where ${}_nq_x$ is the probability of dying from age x to $x+n$; ${}_nD_x$ is the observed total number of deaths from all causes; and ${}_nD_x^i$ is the observed total number of deaths from all causes.

For the associated single decrement life table, a constant of proportionality for decrements other than those under- review in the age intervals needed to be computed. This was done using the following formula:

$$R^i = \frac{{}_nD_x - {}_nD_x^i}{{}_nD_x}$$

Where ${}_nD_x^i$ is the number of deaths from a cause and ${}_nD_x$ is the observed total number of deaths from all causes.

Further for the associated single decrement life table, the probability of surviving from age x to x+n in the absence of a specific cause of death has been used as follows:

$${}_nP_x^i = [{}_nP_x]^{R^i}$$

Where ${}_nP_x$ is the probability of surviving from age x to x+n

Finally for the average number of person years lived in the age intervals (x to x+n) in the absence of causes of death (${}_na_x^i$) two formulae were used. First for ages under 10 years old:

$${}_na_x^i = n + R^{-1} \frac{{}_nq_x}{{}_nq_x^i} ({}_na_x - n)$$

Second for ages over 10 years old:

$${}_5a_x^i = \frac{{}_{-5/24} d_{x-5}^{-i} + 2.5 {}_5d_{x+24}^{-i} + {}_5d_{x+5}^{-i}}{{}_5d_x^{-i}}$$

Source: Preston, et al. 2001

Results

The number of deaths due to interpersonal violence by age and sex shows a dramatic increase in the number of male deaths, aged 25-29 for the period 2006-2010 (Figure 1). This follows on a peak of over 3,000 male deaths in the same age-group in 2001-2005. Female rates from the age of 5-9 onwards are consistently lower than male rates. For adolescents, the distribution of interpersonal violence are about the same for males and females aged 10-14

years old (<100 deaths). However, the number of males deaths increase dramatically at age 15-19 years old at 1,915 in 2001-2005 and 2,741 in 2006-2010, where females deaths increase only marginally at 198 deaths for the period 2001-2005 and 288 deaths for the period 2006-2010.

<<Figure 1 about here>>

To place interpersonal violence within the context of the population and all other causes of death, Table 1 shows the distribution of the population, all causes and interpersonal violence causes of death by age of the adolescents and sex for the period under review. To begin adolescents constitute 17.48% of the total population in 2001-2005. By sex for this period the distribution shows that there are more females than males in the population. By age-group there are more younger (10-14 years) adolescents at 8.90% than older ones at 8.57%. All-cause mortality among adolescents in 2001-2005 contributed 2.32% to the overall mortality rates of the population (all ages). By sex, all-cause mortality was higher among females compared to males in this period. By age-group, Table 1 shows that older males with 1.68% and older females at 1.64%, have a higher number of deaths than younger adolescents (10-14 years old). For the distribution of deaths by interpersonal violence, Table 1 shows that adolescent deaths from this cause contributed 12.77% to the overall mortality from interpersonal violence in the country. In addition, males in both age groups had more deaths than females at 0.76% among 10-14 years and 12.74% among 15-19 years.

For the next period, 2006- 2010, the population of adolescents (10-19 years old) constitutes about 21% of the total population in South Africa. For all-cause mortality, Table 1, shows that there were fewer female deaths among younger than older ages at 0.68% and 1.44% respectively, than males. For interpersonal causes of death, there were more male deaths at 0.64% and 11.86% per age-group respectively than female deaths. Overall, interpersonal violence accounted for 12.16% of all mortality among adolescents in the country for 2006- 2010.

<<Table 1 about here>>

The proportion of interpersonal violence in relation to all others causes of deaths among adolescents is shown in Table 2. The table shows that the proportion is higher for males at 6.08% than females at 0.77% for 2001- 2005. This is also true of the latter period (2006-2010), where the proportion of male deaths accounted for 8.23% of all adolescent male deaths in the country, compared to the 1.11% for females. In total, both sexes combined, the proportion of interpersonal deaths increased from 3.56% in 2001-2005 to 4.9% in 2006-2010. The rate of all-cause mortality per 1,000 adolescent population is also shown in Table 2. For the 2001-2005 period, there were approximately 6.82 deaths per 1,000 population of adolescent males. This is not much higher than the 6.10 deaths per 1,000 population of adolescent females. In 2006-2010, the all-cause mortality rate for males and females remained relatively the same at 6.82 for males and 6.02 for females. Finally, Table 2 shows the rate of deaths for interpersonal violence by sex. In the first period there were 0.85 deaths per 1,000 adolescent male population, which is higher than females

(0.09 per 1,000) and lower than the male rate of death in the latter period (2006-2010) which was 1.13 deaths. The rate of female deaths in the period also increased moderately to 0.13 deaths per 1,000 population.

<<Table 2 about here>>

All-cause life expectancy and life expectancy if interpersonal violence were removed from the mortality experience of the population, by age-group of adolescents and sex is shown in Table 3. For the period 2001- 2005, males could gain about 7 additional years of life if there were no interpersonal causes of death. Females in the same period could gain about 6.5 additional years of life. This has increased life expectancy of adolescent males and females to between 49 and 55 additional years of life. In the second period, 2006-2010, adolescent males could gain as much as 8 additional years of life, which increases their life expectancy to about 55 (10-14 year olds) and 60 (15-19 year olds) additional years of life. Among females in the same period, the potential number of years gained is slightly less at 7 years but also increases their additional number of years to 58 (10-14 year olds) and 53 (15-19 year olds) years respectively.

<<Table 3 about here>>

Discussion

The main objective of this paper is to assess gains in life expectancy for youth if interpersonal violence were to be eliminated from the mortality experience in South Africa. To begin, we found that adolescent male mortality due to

interpersonal violence is higher than female mortality in South Africa (Figure 1). This is consistent with other research in the country where male mortality due to non-disease causes of death among youth are higher for males than females. For example earlier research found that in 2004, the death rate for young (20-24 years) males from unnatural (non-disease) causes was 307 per 100,000 population compared to 91 per 100,000 for females of the same age (Anderson & Phillips 2006). The higher rate of male deaths over female deaths from interpersonal causes of death can be explained by behavioral theories which suggest that overall males are more prone to violent and other risky behaviors than females (Fishbein et al. 2001; Fonagy 1999; Igra & Irwin Jr 1996; Tilley & Brackley 2005). To illustrate this further, male rates of gang involvement are also higher than their female counterparts during youth (Kynoch 1999).

Results of this study show interpersonal violence as a cause of death among adolescents is increasing over time (Table 1). Social factors found to be exacerbating violence in the country include poverty and unemployment, patriarchal notions of masculinity, vulnerabilities of families and exposure to violence in childhood, widespread access to firearms, alcohol and drug misuse (Seedat et al. 2009). Adolescents specifically, face these social challenges and are also vulnerable to the negative effects of peer pressure, weak parental guidance and poor community safety mechanisms such as policing (Keijsers et al. 2010; Kiuru et al. 2010; Voisin et al. 2010).

Results also show that substantial gains in life expectancy can be made with the eradication of interpersonal violence (Table 3). As a non-disease or unnatural cause of death, interpersonal violence is easier to prevent than

disease (De Wet, Dean & Odimegwu). This is largely true because the complexity of disease pathogens (how they develop and spread) make the development of disease and disease outbreaks harder to prevent and treat (including the medical treatment costs).

Conclusion

In order to reduce unnatural causes of death, there is an argument that the best, and cheapest, prevention strategy is behavioral change (Herrenkohl et al. 2000). Despite the obvious benefits of this approach, in a context such as South Africa and other developing countries, violence is a socially and politically entrenched practice, for which behavioral change will not be quick or easy to implement. As argued by Collins (2014) “violent crime is a reflection of deeper patterns of violence within the society, and highlights the importance of including approaches other than law enforcement in reducing violence in South Africa” (Collins 2014). In agreement with Collins (2014), violence in South Africa should be addressed from all angles, starting with which acts of interpersonal violence (in relationships, families and at schools) which are seen as permissible, and strategizing ways to reduce permissible violence. Among adolescents, understanding their household and community exposures to violence will assist in understanding their own attitudes and behaviours toward violence. Further, youth directed programmes to reduce violence should be evaluated for their successes and weaknesses. In doing so, the possibility of developing sex and age sensitive approaches should be incorporated into current policies. If research and policy fails to further examine the causes and impacts of adolescent interpersonal violence, deaths

will increase and future social and economic development will be compromised.

Tables and Figures

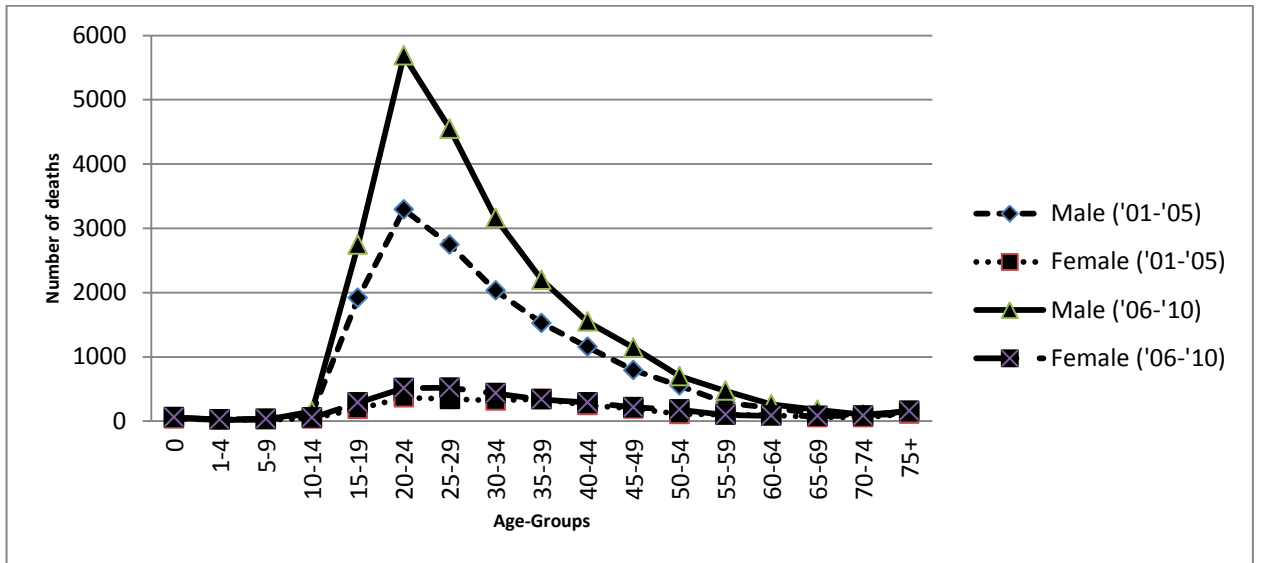


Figure 1: Distribution of interpersonal violence causes of death by sex and age-group, South Africa, 2001- 2010

Table 1: Distribution of population, all causes and interpersonal violence causes of death by age and sex, 2001- 2010

	Male ('01-'05)		Female ('01-'05)		Total ('01-'05)		Male ('06-'10)		Female ('06-'10)		Total ('06-'10)	
	N	%*	N	%*	N	%*	N	%*	N	%*	N	%*
Populati on												
10-14	2,509,127	9.23	2,497,475	8.60	4,010,762	8.90	1,996,061	10.7	3,938,511	10.1	5,165,523	10.4
15-19	2,386,324	8.78	2,434,623	8.38	3,813,236	8.57	1,727,259	10.6	3,335,190	10.0	5,062,449	10.3
Total	4,895,451	18.0	4,932,098	16.9	7,823,998	17.4	3,723,320	21.3	7,273,701	20.1	10,227,972	20.7
		0	8	8			9	8		7		
All causes												
10-14	9,896	0.71	8,216	0.61	18,112	0.66	11,600	0.76	9,842	0.68	21,442	0.72
15-19	23,488	1.68	21,887	1.64	45,375	1.66	23,522	1.54	20,912	1.44	44,434	1.49
Total	33,384	2.38	30,103	2.25	63,487	2.32	35,122	2.29	30,754	2.11	65,876	2.20
Assault												
10-14	115	0.76	41	1.54	156	0.88	149	0.64	53	1.54	202	0.76
15-19	1,915	12.7	190	7.12	2,105	11.8	2,741	11.8	288	11.4	3,029	11.4
Total	2,030	13.5	231	8.66	2,261	12.7	2,890	12.5	341	12.1	3,231	12.1
		0	7	7			0	9.90		6		

*denotes percent of the total population (all age-groups)

Table 2: Proportion of mortality and mortality rate from all causes and Interpersonal Violence causes of death among adolescents (10-19 years old) by sex, 2001- 2010

	2001- 2005			2006- 2010		
	Male	Female	Total	Male	Female	Total
Proportion of Interpersonal Violence Deaths (%)	6.08	0.77	3.56	8.23	1.11	4.90
Rate of all causes (<i>per 1,000 population</i>)	6.82	6.10	8.11	6.82	6.02	6.42
Rate of Interpersonal Violence Deaths (<i>per 1,000 population</i>)	0.85	0.09	0.59	1.13	0.13	0.63

Table 3: Life expectancy if interpersonal violence were removed (e_x^i), number of years gained and percentage of gain in life expectancy (e_x) among adolescents, by sex in South Africa, 2001 and 2010

Year	Age- Group	Males			Females		
		e_x^i	No. of years gained	% gain in e_x	e_x^i	No. of years gained	% gain in e_x
2001- 2005	10-14	55.29	7.31	13.22	59.78	8.35	13.97
	15-19	50.48	7.32	14.50	54.95	8.36	15.21
2006- 2010	10-14	54.11	6.43	11.88	58.03	6.99	12.05
	15-19	49.31	6.44	13.06	53.22	7	13.15

References

- AAPC 2011, 'ICPD -10 Overview', <http://www.aapc.com/ICD-10/icd-10.aspx>.
- Ahrens, C.E. & Campbell, R. 2000, 'Assisting Rape Victims as They Recover From Rape The Impact on Friends', *Journal of Interpersonal Violence*, vol. 15, no. 9, pp. 959-86.
- Anderson, B.A. & Phillips, H.E. 2006, *Adult mortality (age 15-64) based on death notification data in South Africa: 1997-2004*, Statistics South Africa, Pretoria.
- Campbell, J.C. 2002, 'Health consequences of intimate partner violence', *The Lancet*, vol. 359, no. 9314, pp. 1331-6.
- Campbell, R. & Wasco, S.M. 2005, 'Understanding Rape and Sexual Assault 20 Years of Progress and Future Directions', *Journal of Interpersonal Violence*, vol. 20, no. 1, pp. 127-31.
- CDC 2012, *Sexual Violence: Facts At A Glance*, pamphlet, Atlanta.
- CDC 2014, *Trends in Non-Fatal Assault-Related Injury Rates, by Sex, United States 2001-2011*, Centers for Disease Control and Prevention, Atlanta.
- Chiang, C. 1984, *The Life Table and Its Applications*, Robert E. Krieger Publishing Company, Malabar, Florida.
- Coale, A. & Demeny, P. 1983, *Regional Model Life Tables and Stable Populations*, Academic Press, New York.
- Collins, A. 2014, 'Violence is not a crime: The impact of 'acceptable' violence on South African society', *South African Crime Quarterly*, vol. 43, pp. 29-37.
- De Wet, N., Dean, G. & Odimegwu, C., 'Adolescent mortality in South Africa: An analysis of unnatural causes of deaths by sex, 2000-2009', *African Population Studies*, vol. 28, no. 1, pp. 579-89.
- Dhaffala, A., Longo-Mbenza, B., Kingu, J., Peden, M., Kafuko-Bwoye, A., Clarke, M. & Mazwai, E. 2014, 'Demographic profile and epidemiology of injury in Mthatha, South Africa', *African health sciences*, vol. 13, no. 4, pp. 1144-8.
- Donson, H. 2008, 'A profile of fatal injuries in South Africa 2007', *Tygerberg: MRC-UNISA Crime, Violence and Injury Lead Programme*.
- Dorrington, R., Bourne, D., Bradshaw, D., Laubscher, R. & Timæus, I.M. 2001, *The impact of HIV/AIDS on adult mortality in South Africa*, Medical Research Council Cape Town.
- Fishbein, M., Triandis, H.C., Kanfer, F.H., Becker, M. & Middlestadt, S.E. 2001, 'Factors influencing behavior and behavior change'.
- Fonagy, P. 1999, 'Male perpetrators of violence against women: An attachment theory perspective', *Journal of Applied Psychoanalytic Studies*, vol. 1, no. 1, pp. 7-27.
- Gould, C., Burger, J. & Newham, G. 2014, 'The SAPS crime statistics: what they tell us—and what they don't', *South African Crime Quarterly*, vol. 42, pp. 3-12.
- Hamber, B. 1998, 'Dr Jekyll & Mr Hyde: Violence and transition in South Africa', in E. Bornman, R. Van Eeden & M.e. Wentzel (eds), *Violence in South Africa*, Human Sciences Research Council, Pretoria, pp. 349-70.
- Harris, B. 2003, 'Spaces of violence, places of fear: urban conflict in post-apartheid South Africa', *Foro Social Mundial Tematico. Cartagena. Colombia*.
- Herrenkohl, T.I., Maguin, E., Hill, K.G., Hawkins, J.D., Abbott, R.D. & Catalano, R.F. 2000, 'Developmental risk factors for youth violence', *Journal of Adolescent Health*, vol. 26, no. 3, pp. 176-86.
- Igra, V. & Irwin Jr, C.E. 1996, 'Theories of adolescent risk-taking behavior', *Handbook of adolescent health risk behavior*, Springer, pp. 35-51.
- ISS 2014, *Fact Sheet: Explaining the official crime statistics for 2013/14*, Institute for Security Studies, Pretoria.

- Kaminer, D., Grimsrud, A., Myer, L., Stein, D.J. & Williams, D.R. 2008, 'Risk for post-traumatic stress disorder associated with different forms of interpersonal violence in South Africa', *Social Science & Medicine*, vol. 67, no. 10, pp. 1589-95.
- Karunakara, U.K., Neuner, F., Schauer, M., Singh, K., Hill, K., Elbert, T. & Burnham, G. 2004, 'Traumatic events and symptoms of post-traumatic stress disorder amongst Sudanese nationals, refugees and Ugandans in the West Nile', *African health sciences*, vol. 4, no. 2, pp. 83-93.
- Keijsers, L., Branje, S.J., VanderValk, I.E. & Meeus, W. 2010, 'Reciprocal effects between parental solicitation, parental control, adolescent disclosure, and adolescent delinquency', *Journal of Research on Adolescence*, vol. 20, no. 1, pp. 88-113.
- Kimerling, R., Rellini, A., Kelly, V., Judson, P.L. & Learman, L.A. 2002, 'Gender differences in victim and crime characteristics of sexual assaults', *Journal of interpersonal violence*, vol. 17, no. 5, pp. 526-32.
- Kiuru, N., Burk, W.J., Laursen, B., Salmela-Aro, K. & Nurmi, J.-E. 2010, 'Pressure to drink but not to smoke: Disentangling selection and socialization in adolescent peer networks and peer groups', *Journal of adolescence*, vol. 33, no. 6, pp. 801-12.
- Krug, E., Dahlberg, L., Mercy, J., Zwi, A. & Lozano, R., (eds) 2002, *World report on violence and health*, Geneva,.
- Krug, E.G., Mercy, J.A., Dahlberg, L.L. & Zwi, A.B. 2002, 'The world report on violence and health', *The Lancet*, vol. 360, no. 9339, pp. 1083-8.
- Kynoch, G. 1999, 'From the Ninevites to the hard livings gang: township gangsters and urban violence in twentieth-century South Africa', *African Studies*, vol. 58, no. 1, pp. 55-85.
- Lau, U. 2009, 'Intimate Partner Violence'.
- Mulye, T.P., Park, M.J., Nelson, C.D., Adams, S.H., Irwin Jr, C.E. & Brindis, C.D. 2009, 'Trends in adolescent and young adult health in the United States', *Journal of Adolescent Health*, vol. 45, no. 1, pp. 8-24.
- Namoodiri, N.K. & Suchindran, C.M. 1987, *Life table techniques and their applications*, Academic Press Orlando.
- Neocosmos, M. 2008, 'The politics of fear and the fear of politics: Reflections on xenophobic violence in South Africa', *Journal of Asian and African Studies*, vol. 43, no. 6, pp. 586-94.
- Norman, R., Bradshaw, D., Schneider, M., Jewkes, R., Mathews, S., Abrahams, N., Matzopoulos, R., Vos, T. & Collaboration, S.A.C.R.A. 2007, 'Estimating the burden of disease attributable to interpersonal violence in South Africa in 2000', *South African Medical Journal*, vol. 97, no. 8, pp. 653-6.
- Norman, R., Matzopoulos, R., Groenewald, P. & Bradshaw, D. 2007, 'The high burden of injuries in South Africa', *Bulletin of the World Health Organization*, vol. 85, no. 9, pp. 695-702.
- Preston, S.H., Heuveline, P. & Guillot, M. 2001, 'Demography: Measuring and modeling population processes', *Pop. Dev. Rev*, vol. 27, p. 365.
- Seedat, M., Van Niekerk, A., Jewkes, R., Suffla, S. & Ratele, K. 2009, 'Violence and injuries in South Africa: prioritising an agenda for prevention', *The Lancet*, vol. 374, no. 9694, pp. 1011-22.
- Simpson, G., Mokwena, S. & Segal, L. 1992, 'Political violence: 1990', in Robinson M & A.E. Rycroft (eds), *Human rights and labour law handbook*, vol. 2, Oxford University Press, Cape Town, pp. 193-219.
- Sorensen, P. 2012, 'The Marikana Tragedy', *International Journal of Environmental Studies*, vol. 69, no. 6, pp. 871-3.
- Statistics SA 2012, *Victims of crime survey 2012: Reference period January to December 2011* Statistics South Africa Pretoria.

- Statistics SA 2014, *Mortality and causes of death in South Africa, 2011: Findings from death notification*, Statistics South Africa, Pretoria.
- Sulaiman, S.B. 2003, 'A note on the quality of medical certification of deaths in South Africa, 1997-2001', *S Afr Med J*, vol. 93, no. 4, pp. 239-.
- Tilley, D.S. & Brackley, M. 2005, 'Men who batter intimate partners: a grounded theory study of the development of male violence in intimate partner relationships', *Issues in Mental Health Nursing*, vol. 26, no. 3, pp. 281-97.
- Timaeus, I., Dorrington, R., Bradshaw, D. & Nannan, N. 2002, 'Mortality trends in South Africa 1985–2000: From apartheid to AIDS', *Cape Town: South African Medical Research Council*.
- Udosen, A., Etiuma, A., Ugare, G. & Bassey, O. 2006, 'Gunshot injuries in Calabar, Nigeria: an indication of increasing societal violence and police brutality', *African health sciences*, vol. 6, no. 3, pp. 170-2.
- Voisin, D.R., Bird, J.D., Hardesty, M. & Shiu, C.S. 2010, 'African American adolescents living and coping with community violence on Chicago's Southside', *Journal of interpersonal violence*, p. 0886260510383029.
- VPA 2011, 'Violence Prevention Alliance, Global Campaign for Violence Prevention, Plan of Action for 2012-2020', *15th Violence Prevention Milestones Meeting* eds A. Butchart, C. Mikton & B. Kieselbach, Geneva, Cape Town, South Africa.
- Watt, M.H., Sikkema, K.J., Abler, L., Velloza, J., Eaton, L.A., Kalichman, S.C., Skinner, D. & Pieterse, D. 2014, 'Experiences of forced sex among female patrons of alcohol-serving venues in a South African township', *Journal of interpersonal violence*, p. 0886260514540807.
- WHO 2002, *Self-Directed Violence: Facts*, pamphlet, Geneva.
- Wong, T.M. & Van de Schoot, R. 2011, 'The Effect of Offenders' Sex on Reporting Crimes to the Police', *Journal of interpersonal violence*, p. 0886260511425245.