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PREVALENCE AND CAUSES OF VIOLENT DEATHS IN NAIROBI KENYA: AN AUTOPSY STUDY

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Abstract

This study aimed to investigate fatalities resulting from violent deaths to inform public health policy on the need for their prevention. This is a descriptive prospective study of violent deaths in Nairobi. The study included all cases of deaths from violent deaths for twelve consecutive months. Data was entered on a proforma datasheet. Data were analysed using SPSS. Out of 2566 autopsy cases in one year, between June 1, 2009, and May 31 2010, 47.3 per cent of deaths were due to homicide, 43.6 per cent deaths were due to accidents, and 9.1 per cent deaths were due to suicide. Among homicides, 41.5 per cent were due to gunshots, 39.3 per cent were due to blunt injuries, 4.5 per cent were due to stabbing, and 0.4 per cent were due to strangulation. Police shootings comprised 95 per cent of the gunshots, and mob justice comprised 57.3 per cent of the blunt injuries. Among accidents, road traffic accidents contributed 87.3 per cent, with pedestrians as the majority at 46.9 per cent. Amongst the other accidents, burns contributed 35.6 per cent. Among suicide, hanging contributed to 79 per cent. A p-value of 0.03 (95 per cent confidence interval) was found when the data were analysed using an F-test. There was a statistically significant difference (p=0.03) between violent death and alcohol intoxication. Violent deaths require to be studied in the background of the social setting of the death.

Key terms: Accidents, autopsy, homicide, public health policy, violent deaths.

1.0 INTRODUCTION

Violence causing fatal trauma to the body, the commonest cause of unnatural death, is a preventable leading global public health problem. Violent deaths are categorised as those due to homicide, accidents or suicide. In the United States, violent deaths from suicides, homicides, and accidents are the leading cause of death of people aged 1-39 years (WHO, 1999). Death results from either natural or unnatural causes. Natural causes are those from either disease processes or degenerative changes. Unnatural causes are wholly attributable to violence. Violent deaths are categorised as those due to homicide, accidents or suicide. Homicidal deaths encompass murder and manslaughter. Murder refers to the intentional killing of a human being by another, while manslaughter describes the unintentional killing of a human being by another. These deaths could result from gunshots, blunt injuries or sharp, penetrating injuries.

Accidental deaths are categorised into two broad categories; those resulting from road traffic accidents and others. Fatalities resulting from road traffic accidents are further classified on the basis of the class of persons involved, i.e. pedestrians, passengers, drivers and cyclists. Fatalities from other forms of accidents include burns, falls, electrocution and drowning. Suicidal deaths are those that are self-inflicted. They broadly result from gunshots, intentional cut wounds, hanging and poisoning.

2.0 LITERATURE REVIEW

Homicide

The global rate of homicide is 7.6 per 100,000. The highest is 15.5 per 100000 in the Americas, and the lowest is 3.8 per 100,000 in Europe. In Southern Africa, it is 24.7 per 100,000, while in East Africa, it is 20.8 per 100,000 (Wolfgang, 1959). In Maputo, Mozambique, it's recorded as 19.8 per cent (Sauaia, 1995) and lowest in Ibadan, Nigeria, 3.1 per cent (Geneva Declaration on Armed Violence and Development, 2004). Rapid urbanisation and the resulting massive population mobility from rural to urban areas have frequently been cited as possible drivers of homicide. However, UNODC analysis of data from 68 cities suggests that there is no positive correlation between urban growth and increases in homicide rates. In fact, the population in the sample cities grew by 9 per cent between 2005 and 2016, but the number of homicides decreased by 26 per cent. This relationship holds for all regions, with the strongest diverging trends in Asia, followed by Europe. Homicide is categorised based on the mode as those due to gunshots, sharp objects, blunt force, mob justice, strangulation and suffocation.

The prevalence of homicidal gunshot injuries is highest in New York at 75 per cent (Geneva Declaration on Armed Violence and Development, 2009), 67 per cent in Benin City, Nigeria (Hanifa et al. 2006), and lowest in Chitwan, Nepal 4 per cent (Eze at al. 2011). In Hong Kong, domestic killing is the major type of Homicide in which over 60 per cent of the homicide motivations were dispute, relationship conflicts, altruism, and mental illness. Spouses, 46.5 children, and 47.5 per cent were predominantly the victims. The common killing methods included chopping with weapons 33.3 per cent and charcoal burning 22.2 per cent. The study concludes that financial problems, disputes and domestic violence are significant precipitants of Homicide suicide in Hong Kong and recommends that those people associated with the precipitating factors should be the targets for intervention and prevention (Yip et al., 2009).

Suicide

Suicide mortality is recognised globally as a severe public health issue. It ranks among the leading causes of global deaths; it accounts for 1.5 per cent of global mortality and affects millions of families, communities, and individuals annually. Each year, there are close to 700,000 suicide cases and even more attempts to do so, constituting a major public health crisis. Worldwide, death by suicide reduced by more than 30 per cent between 1990 and 2016, due mostly to declines in suicide mortality in largely populated countries such as India and especially China; however, there is an indication of rising suicide trends in certain countries: Zimbabwe, Uganda, Liberia, Cameroon, Jamaica, Mexico, Paraguay, and the United States.

Suicide is one of the world's primary causes of death, accounting for a million deaths annually, with a suicide rate of 11.70 per 100,000; worldwide Prevalence varies from 0.0 per 100,000 in Egypt to 31.5 per 100,000 in Lithuania (Bossarte, 2006). The prevalence of suicide in the city is highest in Ljubljana, Slovenia, 31.2 per (Fujiwara, 2009) and lowest in Benin City, 1.8 per cent (Logan et al., 2008). The prevalence of suicide by poisoning is reported highest in Belgaum, Karnataka, at 53.6 per cent (Mohanty et al., 2007).

Accidents

Accidents; road traffic accidents worldwide prevalence is 20.8 per 100,000 road traffic accidents. It is highest in the United States of America at 12.3 per 100,000 and lowest in the; in Africa, it is highest in Mozambique at 34.7 per 100,000 and lowest in Burundi at 23.4 per 100, 000, while in Kenya it is 34.4 per 100,000, no worldwide data is available for the other forms of accidents (Akhiwu et al., 2004). The prevalence of fatal road traffic accidents is reported highest in Chitwan, Nepal, 47 per cent (Gouda & Aramani, 2010), Maputo Mozambique, 43.7 per cent (Comstock, 2005) and lowest in Northern Norway, 18.6 per cent (Roberts et al., 2010). The prevalence of other types of accidents was for drowning at 7 per cent (Dzamalala et al., 2006) and 17.4 per cent (Bilban & Skibin, 2005), burns at 2 per cent (Azmak et al., 2006) and 7.8 per cent (Mohan et al., 2006), while a single study revealed the prevalence of accidents from animal bites at 3 per cent (Ndosi et al., 2004).

3.0 METHODOLOGY

This was a descriptive prospective study of violent deaths in Nairobi from June 1, 2009 –May 31, 2010. It was carried out at the city Mortuary, Nairobi. The city mortuary is the largest mortuary in Nairobi, situated at the junction of Mbagathi Way and Ngong road. The City Council of Nairobi runs it. The Ministry of Health is also involved by way of hiring the pathologists who provide the services. The morticians are, however, hired by the Nairobi City Council. This mortuary receives approximately 200 bodies of unnatural deaths every month. In addition, it is the main centre for medico-legal autopsies in Nairobi. The study subjects were recruited consecutively for one calendar year. To calculate the prevalence of violent deaths in Nairobi, all bodies that were a result of violent injuries were included in the study; bodies that were badly decomposed and, therefore, cause of death could not be ascertained were excluded from the study.

4.0 RESULTS AND DISCUSSION

Autopsies were conducted on 2566 bodies over a period of one year (Table 1). Two thousand four hundred and forty-two cases were analysed for violent deaths.

Table 1: Distribution of Deaths by Categories in Nairobi, Kenya

Cause	Total %
Violent deaths	95.2
Natural Death	3.2
Unascertained	1.6
Total	100

The causes of death were distributed among all the known causes of violent deaths, namely homicide 47.3 per cent, accidents 43.6 per cent and suicide 9.1 per cent (Table 2).

Table 2: Distribution of Violent Deaths by Category in Nairobi, Kenya

Cause of Death	Numbers %
Homicide	47.3
Accident	43.6
Suicide	9.1
Total	100

Prevalence of Violent Deaths in Kenya

The population of Nairobi City at the time of conducting the study was estimated at 3.7 Million persons; thus, the prevalence of violent deaths calculates at 66 persons per 100,000. The total number of deaths in Nairobi during the period of the study was 5695. Prevalence for homicide in Nairobi calculates at 31.2 per 100 000, accidents 28.8 per 100,000 and that for suicide 6.1 per 100,000.

Homicide

This comprised 47.3 per cent of all violent deaths, categorised as deaths resulting from gunshots, 41.5 per cent, blunt injuries, 39.3 per cent, stabbing, 4.5 per cent and strangulation, 0.4 per cent (Table 3).

Table 3: Distribution of Homicide Cases by Cause in Nairobi, Kenya

Causes	Number	%
Gunshot	479	41.5
Blunt injuries	454	39.3
Stabbing	52	4.5
Strangulation	5	0.4
Total	990	100

The gunshots were cases of individuals being shot by police 95 per cent shooting by unknown people 4.2 per cent and police shot by robbers 0.8 per cent (Table 4).

Table 4: Distribution of Gunshots by Categories in Nairobi, Kenya

Categories of gunshots	Number	%
Shot by police	455	95
Shot by unknown people	20	4.2
Police shot by robbers	4	0.8
Total	479	100

The blunt injuries resulted from mob justice 57.3 per cent, and murder by blunt objects 38.6 per cent. (Table 5).

Table 5: Distribution of Blunt Injuries by Categories in Nairobi, Kenya

Categories of blunt injuries	Number	%
Mob justice	271	57.3
Blunt objects	183	38.6
Burns and Blunt injuries	19	4.0
Total	473	100

Out of the 67 cases that had burns and were therefore considered accidental deaths, at post-mortem, 4 per cent of them were found to have severe blunt injuries; thus, they were reclassified as homicides. Stabbing cases resulted from sharp objects, which included knives and other sharp metals. Out of the 42 cases classified under drowning, 13.3 per cent were found to have stab wounds at post-mortem and were reclassified as a homicide**.** (Table 6).

Table 6: Distribution of Stabbing Cases by Categories in Nairobi, Kenya

Categories of stabbing	Number	%
Homicide	52	86.6
Drowned with stab wounds	8	13.3
Total	60	100

Accidents

These comprised 43.6 per cent of violent deaths. The accidents were caused by road traffic accidents 87.3 per cent, while other accidents were 12.7 per cent (Table 7).

Table 7: Distribution of accident cases in Nairobi, Kenya

Accidents	Number	%
Road Traffic Accident	929	87.3
Other accidents	135	12.7
Total	1064	100

Road traffic accidents by class comprised pedestrians 46.9 per cent, cyclists 25.2 per cent, passengers 23.0 per cent and drivers 4.8 per cent (Table 8).

Table 8: Distribution of Road Traffic Accidents Cases by Class in Nairobi, Kenya

Categories of Road Traffic Accidents	Number	%
Pedestrian	436	46.9
Cyclist	234	25.2
Passenger	214	23.0
Drivers	45	4.8
Total	929	100

Other accidents included burns 41.4 per cent drowning 25.9 per cent falling from a height 14.8% electrocution 12.3 per cent and falling from moving trains 5.6 per cent. The burns were caused by domestic fires, kerosene lamps, gas cylinders, candles and fires from neighbours' houses (Table 9).

Table 9: Distribution of Other Accidents Cases by Categories in Nairobi, Kenya

Categories of other accidents	Number	%
Burns	67	41.4
Drowning	42	25.9
Falling	24	14.8
Electrocution	20	12.3
Falling from a height	9	5.6
Total	162	100

Suicide

Suicide was committed by hanging 79.0 per cent poisoning 28.3 per cent, jumping from a height 2.23 per cent and stabbing 0.4 per cent (Table 10).

Table 10: Distribution of Suicide by Category in Nairobi, Kenya

Categories of suicide	Numbers	%
Hanging	177	79.0
Poisoning	41	28.3
Jumping from height	5	2.23
Stabbing	1	0.4
Total	224	100

Hanging was done by ropes, wires and ties. This was mainly in dwelling houses and bushes, thickets and forests. Thirty-seven of the cases had suicide notes left behind; among the suicide notes, the precipitating factors were quarrels with a spouse, jilted lovers, loss of jobs and depression. Poisoning was deliberately using organophosphate, chemicals and rat poison. Eight of the cases left suicide notes. Among the suicide notes, the precipitating factors were quarrels with a spouse, jilted lovers, loss of jobs and depression. Jumping from a height comprised jumps from tall buildings; only one case left a suicide note. The precipitating factor was the loss of a job. The stabbing was done using a knife, and no suicide note was left.

DISCUSSION

This study describes violence-related mortality in Nairobi. The estimated population of Nairobi City is 3 million inhabitants. This is the first autopsy-based study to estimate rates of homicide, accidents and suicide in Kenya. The data in this study provides an important benchmark against which to compare future National estimates of violence-related mortality. These data also help to place the National pattern of violence-related mortality in a global perspective by allowing a contrast of such patterns with those for the world and its major regions. In 1990, there were an estimated 1,851,000 violence-related deaths in the world, or on average, 5000 people died daily as a result of violence. The current study found that there were 2442 (81.4 per 100,000) violence-related deaths in Nairobi.

Suicides represented approximately 42.5 per cent of the total violence-related deaths in the world, while homicide and war-related deaths constituted the remaining 30.4 per cent and 27.1 per cent, respectively. In the current study, homicide represented 47.3 per cent of the total violence-related deaths, while accidents and suicide constituted the remaining 43.6 per cent and 9.1 per cent, respectively. The age range was from 10-79; overall, the highest number of deaths were in the age group 30-39, 39.9 per cent, followed by the age group 20-29, 38.8 per cent. The least deaths were in the age group 70-79, 0.1 per cent. The distribution of violent deaths showed variation by gender. Males comprised the largest group. The highest number of deaths in males was recorded in homicide, 44.8 per cent, and accidents, 45.6 per cent. Amongst females, the commonest cause of violent deaths was in accidents, 68 per cent, followed by homicides, 21.5 per cent. The least cause of death amongst females was from suicides, 10.5 per cent.

Prevalence of Violent Deaths

The current study reveals the prevalence of violent deaths in Nairobi as 66 per 100,000, comparable to Durban 69.5 per 100,000 (Marzuk, 1996). It is, however, lower than that of Sydney, 74.5 per 100,000 (Olukoga, 2008) but is extremely high when compared with the prevalence in London, 13.3 per 100 000 (Meel, 2007).

Prevalence of Violent Deaths by Cause

A current study reveals the cause of death in Kenya as Homicide at 47.3 per cent, Accidents at 43.6 per cent and suicide at 9.1 per cent.

Homicide

The current study reveals that homicide constituted 47.3 per cent of all violent deaths (33 per 100,000 of the population). This is higher than the world average (7.6 per 100,000, WHO, 2002), almost half of the findings in Cape Town (66 per 100,000), Durban (61 per 100,000), much less than at Johannesburg (52 per 100,000) but higher than the finding in Pretoria/Tshwane (24 per 100,000) (Matzopoulos, 2003), Dar es Salaam (12.95 per 100,000) and Kampala (24.5 per 100,000). The categories of homicide included gunshots, blunt injuries, stabbing and strangulation.

Gunshots

This comprised 41.5 per cent of all the homicides in the current study Gunshots were cases of individuals being shot by police 95 per cent, shooting by unknown people 4.2 per cent and police shot by robbers 0.8 per cent. While in the other studies, the contribution of police shootings was

negligible, most of the deaths were due to personal violence due to substance abuse, interspousal problems, mental illness and loss of means of economic survival (World Health Assembly, 1996).

Blunt Injuries

Blunt injuries comprised 39.3 per cent of all the homicides in the current study; they included deaths as a result of Mob justice, blunt objects and in combination with burns. Mob justice contributed to 57.3 per cent of deaths in this category in the current study. Mob justice as a phenomenon was not found to be a contributing factor to homicide in South Africa and the United States of America. Homicide rates in Nairobi would be reduced substantially if the socioeconomic status improves, and the entrenched self-help method of the society to deal with crime, i.e. mob justice, should be discouraged. Blunt Objects 38.6 per cent, burns and blunt injuries 4 per cent, stabbing 4.5 per cent and strangulation 0.4 per cent.

Accidents

Road Traffic accidents

In the current study, road traffic accidents contributed 87.3 per cent (31 per 100,000) of all the deaths as a result of accidents; this is much higher than that at Windsor area 0.43 per 100,000 (Mercy et al., 1993), Maputo City 43.7 per cent (Murray et al., 1994), Belgaum, Karnataka 56 per cent (Gartner, 1990), Transkei 35 per cent, 63 per 100,000 (Fingerhut & Kleinman, 1990)**,** Manipal Southern India 37 per cent (Jeanneret, 1993), Addis Ababa, 80 per cent (La Vecchia et al., 1994). Road traffic accident accidents in other countries show Namibia 53.4 per 100,000, Swaziland 48.2 per 100,000, Zambia 37.9 per 100,000, Uganda 34.7 per 100,000, Tanzania 29.6 per 100,000, Kenya 28.2 per 100,000, Liberia 21.5 per 100,000, Mali 20.5 per 100,000, Japan 3.8 per 100,000, Fiji 3.8 per 100,000, Switzerland 3.8 per 100,000. Road traffic accidents comprised all known classes: pedestrians 46.9 per cent, cyclists 25.2 per cent, passengers 23.0 per cent and drivers 4.8 per cent.

Other Accidents

In the current study, all other accidents contributed 12.7 per cent. In Northern Norway, accidental poisoning contributed 11.5 per cent of all other accidents, while in Maputo City, burns contributed 7.8 per cent of all other accidents (Lester, 1997). Deaths in other accidents in the current study comprised burns at 41.4 per cent, drowning at 25.9 per cent, falling at 14.8 per cent, electrocution at 12.3 per cent and falling from a height at 5.6 per cent.

Suicide

In Nairobi, these comprised 9.1 per cent of violent deaths (7.5 per 100,000). The suicide rates were seen to be very high in Guyana 32.5, Lithuania 31.2, Kazakhstan 31.1, Swaziland 25.3, Malawi 23.3, Namibia 22.3, Japan 19.8, Uganda, 17.6, Tanzania 11.2, Kenya 10.1, Denmark 10.1, Sudan 9.7, Rwanda 9.3, Canada 9.9, Germany 9.1, South Africa 7.4, Ghana 7.3, and Mali 4.6. This correlates with the findings in Bennin City (7 per 100,000, and Lusaka (7.4 per 100,000, higher than in Cape Town (0.7 per 100,000, and Durban (0.89 per 100,000) and lower than in London (11.0 per 100,000, Ankara (15.5 per 100,000) and New York (18.3 per 100,000), (Schmidtke, 1997). The reasons for suicide were similar, which included mental illness, substance abuse, severe marital and family conflicts, overwhelming disappointments in love affairs and unwanted pregnancies, and overwhelming economic deprivation**.** In Nairobi, suicide was mainly in dwelling houses, bushes, thickets, and

forests. In some cases, suicide notes were left behind; among the suicide notes, the precipitating factors were quarrels with a spouse, jilted lovers, loss of jobs and depression. The modalities of committing suicide in the current study included hanging 79.0 per cent, poisoning 28.3 per cent, jumping from a height 2.23 per cent and stabbing 0.4 per cent.

5.0 CONCLUSION AND RECOMMENDATIONS

Conclusion: In conclusion, violent deaths are a public health problem in Nairobi, Kenya. The categories of violent deaths are homicide, accidents and suicide. Homicide and Accidents are the major contributors to violent deaths. The commonest cause of homicide is gunshots by the police and blunt injuries resulting from mob justice. The leading cause of accidental deaths in road traffic accidents, with pedestrians being the class most identified. Suicide though a significant cause of violent deaths globally, is not a major problem in Nairobi compared to the other categories of violent deaths and global statistics. The manner of committing suicide in Nairobi, Kenya, is hanging and poisoning.

Recommendations: A current study reveals that violent deaths are a major problem in Nairobi, Kenya and public health measures and policies need to be implemented to address this malady. Homicide was largely caused by police shootings and involved very young males; there is a need to investigate the factors surrounding these shootings. Deaths from mob justice should be preventable by educating the members of the public not to take the law unto their hands. In accidents, the largest contributor to violent deaths was road traffic accidents, with pedestrians and cyclists being the majority; there is a need to evaluate the design of the roads or education of road users. Alcohol contributed significantly to violent deaths across all the categories. It is thus necessary to tighten the legal aspects of alcohol intake and, in particular, as relates to road traffic accidents. The age most prone to fatal violent deaths is 20-39; social values and behaviour require redress to prevent these deaths. Males were more prone to violent deaths; society should address the plight of the male child. Further studies are recommended in the area of forensic toxicology, which shall broaden the number of testable chemicals. Violent deaths require to be studied in the background of the social setting of the death.

6.0 REFERENCES

1. Akhiwu, W. O., Nwosu, S. O., & Aligbe, J. U. (2000).Homicide and Suicide in Benin City, Nigeria. *Anil Aggrawal's Internet Journal of Forensic Medicine and Toxicology, 1*(2).
2. Akhiwu, W. O., Nwosu, S. O., & Aligbe, J. U. (2000).Homicide and Suicide in Benin City, Nigeria. *Anil Aggrawal's Internet Journal of Forensic Medicine and Toxicology, 1*(2).
3. Azmak, A. D. (2006). Suicides in Trakya region, Turkey, from 1984 to 2004. *Medicine, Science, and the Law*, *46*(1), 19–30. https://doi.org/10.1258/rsmmsl.46.1.19.
4. Bilban, M., & Skibin, N (2005). Presence of alcohol in suicide victims. *Forensic Sci Int. 147*, S9-12.
5. Bossarte, R. M., Simon, T. R., & Barker, L. (2006). Characteristics of homicide followed by suicide incidents in multiple states, 2003-04. *Inj Prev. 2*(2), 33-38. doi: 10.1136/ip.2006.012807. PMID: 17170169; PMCID: PMC2563486.
6. Comstock, R. D., Mallonee, S., & Jordan, F. A. (2005). Comparison of two surveillance systems for deaths related to violent injury. *Injury Prevention*; 11, 58-63.

7. Dzamalala, C. P., Milner, D. A., & Liomba, N. G. (2006). Suicide in Blantyre, Malawi (2000-2003). *Journal of clinical forensic medicine*, *13*(2), 65–69. https://doi.org/10.1016/j.jcfm.2005.08.006.
8. Eze, W., Akang, E., & Odesanmi, W. O (2011). Pattern of homicide coroner's autopsies at University College Hospital, Ibadan Nigeria: 1997-2006. *Medicine, Science and the Law*, *51*(1), 43-48.
9. Fingerhut, L. A., & Kleinman, J. C. (1990). International and interstate comparisons of homicide among young males. *JAMA*, *263*(24), 3292–3295.
10. Fujiwara, T., Barber, C., Schaechter, J., & Hemenway, D. (2009). Characteristics of infant homicides: findings from a U.S. multisite reporting system. *Pediatrics. 124*(2):e210-e217. doi: 10.1542/peds.2008-3675. Epub 2009 Jul 20. PMID: 19620199.
11. Gartner, R. (1990). The Victims of Homicide: A Temporal and Cross-National Comparison. *American Sociological Review*, *55*(1), 92–106. https://doi.org/10.2307/2095705.
12. Geneva Declaration on Armed Violence and Development. (2004). Published in Switzerland by the *Geneva Declaration Secretariat.*
13. Geneva Declaration on Armed Violence and Development. (2008). *Geneva Declaration Secretariat.* www.genevadeclaration.org.
14. Gouda, H. S., & Aramani, S. C. (2010). Analysis of Medico-Legal Autopsies-A 6 years Retrospective Study: *Indian Internet Journal of Forensic Medicine & Toxicology, 8*(1).
15. Hanifa, N., Meyrowitsch, D. W., Zacarias, E., & Konradsen, F. (2006). Mortality due to Injuries in Maputo City, Mozambique. *International Journal of Injury Control and Safety Promotion, 13*(1), 1-6.
16. Jeanneret, 0, Sand, E. A. (1993). Intentional violence among adolescents and young adults: an epidemiological perspective. *World Health Stat Q*, 46, 34-5l.
17. La Vecchia, C., Lucchini, F., & Levi, F. (1994). Worldwide trends in suicide mortality, 1955-1989. *Acta psychiatrica Scandinavica*, *90*(1), 53–64. https://doi.org/10.1111/j.1600-0447.1994.tb01556.x.
18. La Vecchia, C., Lucchini, F., Levi, F. (1994). Worldwide trends in suicide mortality, 1955-1989. *Acta Psychiatr Scand*, 90, 53-64.
19. Lester, D. (1997). Suicide in an international perspective. *Suicide & life-threatening behavior*, *27*(1), 104–111.
20. Logan, J., Hill, H. A., Black, M. L., Crosby, A. E., Karch, D. L., Barnes, J. D., & Lubell, K.M. (2008). Characteristics of perpetrators in homicide-followed-by-suicide incidents: National Violent Death Reporting System--17 US States, 2003-2005. *Am J Epidemiol. 168*(9), 1056-1064. doi: 10.1093/aje/kwn213. Epub 2008 Sep 15. PMID: 18794221.PMID: 20852215.
21. Marzuk, P. M. (1996). Violence, crime, and mental illness. How strong a link? *Arch Gen Psychiatry. 53*(6), 481-486. doi: 10.1001/archpsyc.1996.01830060021003. PMID: 8639030.
22. Matzopoulos, R. (2003). Violent Deaths in SA: The 2003 National Injury Mortality Surveillance System. *South African Crime Quarterly*. 10.17159/2413-3108/2005/v0i13a1009.
23. Meel, B. L. (2007). Trends in fatal motor vehicle accidents in Transkei region of South Africa. *Med Sci Law. 47*(1), 64-68. doi: 10.1258/rsmmsl.47.1.64. PMID: 17345893.
24. Mercy, J. A., Rosenberg, M. L., Powell, K. E., Broome, C. V., & Roper, W. L. (1993). Public health policy for preventing violence. Health affairs (Project Hope), *12*(4), 7–29. https://doi.org/10.1377/hlthaff.12.4.7.

25. Mohan, K. T., Kanchan, T., & Yoganarasimha, K. (2006). Profile of Unnatural Deaths in Manipal, Southern India 1994-2000.

26. Mohanty, S., Sahu, G., Mohanty, M. K., & Patnaik, M. (2007). Suicide in India-A four-year retrospective study. *Journal of Legal and Forensic Medicine*, *14*(4), 185-189.

27. Murray, C. J., Lopez, A. D., & Jamison, D. T. (1994). The global burden of disease in 1990: summary results, sensitivity analysis and future directions. *Bulletin of the World Health Organization*, *72*(3), 495–509.

28. Ndosi, N. K., Mbonde, M. P., & Lyamuya, E. (2004). Profile of suicide in Dar es Salaam. *East Afr Med J. 81*(4), 207-211. doi: 10.4314/eamj.v81i4.9157. PMID: 15884288.

29. Olukoga, A. (2008). Pattern of road traffic accidents in Durban municipality, South Africa. *West Afr J Med. 27*(4), 234-237. PMID: 19469402.

30. Roberts, K., Wassenaar, D., Canetto, S. S., & Pillay, A. (2010). Homicide-suicide in Durban, South Africa. *Journal of interpersonal violence*, *25*(5), 877–899. https://doi.org/10.1177/0886260509336964.

31. Sauaia, A., Moore, F. A., Moore, E. E., Moser, K. S., Brennan, R., & Read, R. A. (1995). Epidemiology of trauma deaths: a reassessment. *J Trauma 38*(2):185–93.

32. Schmidtke, A. (1997). Perspective: suicide in Europe. *Suicide & life-threatening behavior*, *27*(1), 127–136.

33. Wolfgang, M. E. (1959). Patterns in Criminal Homicide. *Patterson Smith series in criminology, law enforcement, and social problems.* University of Pennsylvania.

34. World Health Assembly. (1996). *World Health Assembly resolution 49.25. Prevention of violence: a public health priority.* Forty-ninth World Health Assembly, Geneva, 25 May 1996.World Health Organization (WHO) (1999). *Injury*: A leading cause of the global burden of disease.

35. Yip, P. S., Wong, P. W., Cheung, Y. T., Chan, K. S., & Beh, S. L. (2009). An empirical study of characteristics and types of homicide-suicides in Hong Kong, 1989-2005. *Journal of Affective Disorders*, *112*(1-3), 184–192. https://doi.org/10.1016/j.jad.2008.05.005.