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## Estimating the burden of disease attributable to interpersonal violence in South Africa in 2000

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**To the Editor:** Violence, previously considered a social issue, is now an acknowledged public health problem. It is defined as the intentional use of physical force or power, threatened or actual, against another person, against oneself, or against a group or community, that results in injury, death or deprivation.<sup>1</sup> In this study we focus on exposure to the interpersonal type of violence, which includes acts of family violence and community violence. Family violence is further categorised by victim: child, intimate partner, or elder. Community violence occurs among unrelated individuals and includes sexual assault and rape by strangers as well as youth violence.

In South Africa (SA) violence has become the normative and accepted strategy for resolving conflict. This is the result of many decades of social injustice and political violence including state-sponsored violence. The political transition has seen a decrease in political conflict but exceedingly high levels of interpersonal violence remain, fuelled by rapid urbanisation and ongoing economic disparities. Injuries directly related to interpersonal violence caused an estimated 27 563 deaths in South Africa in 2000. The age-standardised homicide rate (65 per 100 000) was more than seven times the global average, placing South Africa among the most violent countries in the world.<sup>2</sup> Homicide was the leading cause of fatal injury in males and rates peaked in the 15 - 29-year age group at 184 per 100 000, ninefold higher than the global rate.<sup>2</sup> High levels of gender-based violence are also evident with excessive rates of female homicides. A recent study has shown that 1 in every 2 women killed by a known perpetrator in South Africa is killed by an intimate partner, leading to the highest reported intimate

femicide rate in the world: 9 per 100 000 women.<sup>3</sup>

In addition to deaths resulting from interpersonal violence, the years of life lost (YLLs) due to premature mortality, years of life lived with disability (YLDs) resulting from non-fatal injuries and disability-adjusted life years (DALYs) were also estimated.<sup>2,4</sup> However, there is strong evidence to indicate that exposure to non-fatal violence has serious and long-lasting health consequences. Child abuse, intimate partner violence (IPV), sexual assault and rape result in increased incidence of depression, anxiety disorders, eating disorders, post-traumatic stress disorder and substance abuse as well as reproductive health problems and sexually transmitted infections, including HIV infection.<sup>5-15</sup> Acknowledging that the mental health, behavioural and reproductive health consequences of interpersonal violence are substantial, the measurement of DALYs restricted to injuries would grossly underestimate the burden caused by exposure to violence, particularly the non-fatal component.<sup>16</sup>

Furthermore, levels of violence in a society are modifiable and preventable and given the exceedingly high levels of interpersonal violence in South Africa, its full impact needs to be measured and recognised as a priority for effective interventions. Interpersonal violence (encompassing the various subcategories) was therefore included as one of the 17 risk factors in the South African Comparative Risk Assessment (SA CRA) study. Unfortunately, interpersonal violence was not among the selected major risk factors for global and regional burden of disease studies included in the WHO CRA study,<sup>17,18</sup> although Andrews *et al.*<sup>14</sup> did quantify the child sexual abuse (CSA) component. More recently, Vos *et al.*<sup>5</sup> included IPV as a risk factor for the first time and estimated the contribution of IPV to the burden of disease of women in Victoria, Australia. Subsequently, the burden attributable to both CSA and IPV was estimated for the first time in the Australian 2003 burden of disease study.<sup>19</sup>

A framework for estimating the impact of interpersonal violence on health in South Africa was developed, adapted from the WHO framework for violence.<sup>1</sup> Exposures to family and community types of interpersonal violence of a physical and sexual nature<sup>1</sup> as well as related health outcomes were included in the basic framework. The total burden of disease and injury attributable to interpersonal violence was estimated for selected health outcomes (Fig. 1) using categorical and counterfactual approaches.<sup>20</sup> The estimates, however, were constrained by data availability and it was not possible to distinguish some types of family violence such as child

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Type of interpersonal violence		
Community and family violence (elder and child abuse but excluding intimate partner violence)*	Child sexual abuse (contact and intercourse)	Intimate partner violence (current and previous)
Related health outcomes		
Homicides Physical injuries	Homicides <sup>‡</sup> Physical injuries <sup>‡</sup>	Intimate femicide Physical injuries
Mental health outcomes, harmful health-related behaviours (tobacco, alcohol and illicit drug use), suicide and self-inflicted injuries, reproductive health problems and sexually transmitted infections <sup>‡</sup>	Depression Panic disorder Alcohol dependence Drug dependence Post-traumatic stress disorder Self-inflicted injuries Sexually transmitted infections, unwanted pregnancies, sexual dysfunction <sup>‡</sup>	Self-inflicted injuries Depression Anxiety Eating disorders <sup>§</sup> Tobacco use Alcohol dependence Drug dependence Sexually transmitted infections, unwanted pregnancies, sexual dysfunction <sup>‡</sup>

\*Owing to data limitations this category includes unspecified types of community and family violence where perpetrator/victim is unknown.  
<sup>‡</sup>Not included owing to lack of data on prevalence of exposure and/or hazard size.  
<sup>‡</sup>Owing to data limitations, these injuries are included in the 'unspecified community and family violence' estimate.  
<sup>§</sup>Not included in revised South African National Burden of Disease 2000 list.<sup>4</sup>

Fig. 1. Selected forms of interpersonal violence and related health outcomes quantified in the South African CRA.

and elder abuse from community violence. Interpersonal violence injury burden<sup>4,21</sup> caused by exposure to violence of a physical and sexual nature but where the perpetrator-victim relationship was unknown was categorically attributed to exposure to 'unspecified community and family violence'. In addition, using CRA methods<sup>17,18</sup> of counterfactual analysis it was possible to quantify the additional health impact related to exposure to two types of family violence, namely CSA and IPV (Fig. 1). Mental health outcomes, behavioural consequences, suicide attempts and sexually transmitted infections are also likely causal outcomes related to community violence and the other types of family violence, but these could not be quantified because of lack of sufficient evidence on prevalence and hazard size (Fig. 1).

The contribution of CSA and IPV as risk factors to burden of disease and injury was estimated separately by comparing the current local health status in each case with a theoretical minimum counterfactual with the lowest possible risk. For both IPV and CSA the theoretical minimum was defined by the counterfactual status of no exposure to these types of family violence in the population. The population-attributable fractions (PAF) were determined by the prevalence of exposure to these risk factors and the relative risks of disease occurrence given exposure. A review of locally published work and international databases was carried out to obtain data on prevalence of exposure and hazard size. For the contact and intercourse types of CSA, the Stepping Stones<sup>22,23</sup> study in the Eastern Cape was identified as the best available data source for prevalence of exposure. For hazard size, relative risks (RRs) published in the WHO global CSA assessment by Andrews *et al.*<sup>14</sup> were used. Two categories of exposure to IPV were used,

namely physical or sexual violence by a partner in the last 12 months (current IPV) and physical or sexual violence by a partner more than 12 months ago (previous IPV). Rural<sup>24</sup> and urban<sup>25</sup> estimates of prevalence of exposure were weighted to obtain a national estimate. RRs used were those published by Vos *et al.*<sup>5</sup> from the Australian Longitudinal Study on Women's Health. Women who experience CSA are also more likely to experience IPV compared with non-abused women.<sup>26</sup> Furthermore, women who experience multiple types of abuse, including CSA and IPV, are at a higher risk of related mental health disorders compared with women who only experience one type of abuse.<sup>27-29</sup> Following the method used in the Australian 2003 burden of disease study,<sup>19</sup> in order to avoid overestimating the burden attributable to these two risk factors it was necessary to determine the prevalence of IPV only, without CSA, and CSA only without IPV. Prevalences were adjusted using local data<sup>25</sup> on revictimisation through IPV for women who experienced CSA (contact and intercourse types). It was also necessary to adjust the relative risk to account for the combined exposure state of having experienced both CSA and IPV.<sup>19</sup> In the joint effects analysis, the burden attributable to IPV and CSA was calculated as the sum of the PAFs for exposure to IPV only, CSA only and the combined exposure state<sup>19</sup> applied to the 2000 revised burden of disease estimates,<sup>4</sup> deaths, YLLs, YLDs and DALYs for the relevant disease categories. Monte Carlo simulation-modelling techniques were used for the uncertainty analysis.

Interpersonal violence (including not only the injury burden but also some of the mental health, behavioural and reproductive long-term health consequences) was an important risk to health in South Africa and accounted for an estimated



34 776 deaths (95% uncertainty interval 32 487 - 37 473) or 6.7% (95% uncertainty interval 6.2% - 7.2%) of all deaths in South Africa in 2000. Out of the 17 risk factors included in the SA CRA, it was the second leading cause of healthy years of life lost after sexually transmitted infections from unsafe sex. Interpersonal violence accounted for 1.4 million DALYs or 8.4% of all DALYs (95% uncertainty interval 7.9% - 9.1%) in 2000. Attributable burden was higher in males (62.2%) than females (37.8%). The contribution of the different interpersonal violence subcategories was assessed in females. IPV accounted for 62.4% of the total interpersonal violence attributable burden in females. Injury burden from 'unspecified community and family violence' contributed 29.2% and child sexual abuse 8.5% of the total interpersonal violence attributable burden in females.

This is the first attempt to quantify the burden of disease attributable to exposure to interpersonal violence encompassing the various subcategories. It is, however, difficult to quantify the full impact of non-fatal violence as many acts of violence are not reported and data are incomplete. Notwithstanding the inclusion of some of the associated long-term disability, this study still underestimates the true burden due to interpersonal violence. It has not been possible to quantify the longer-term health consequences of exposure to community physical violence, particularly affecting men. The long-term mental, behavioural and reproductive health consequences of sexual assault by acquaintances and strangers could also not be quantified. Furthermore, owing to data limitations, it was also not possible to quantify the impact of exposure to elder abuse and child physical abuse on mental health. Neither was it possible to quantify the pernicious role of violence in undermining the social fabric of communities.

The findings of this study reiterate the urgent need to address violence in our society and to improve the availability of reliable data. Violence is a complex problem and needs to be addressed in a comprehensive and holistic manner. The public health approach to violence recognises that violence, like any other disease or health problem, has a human host with an inherent risk profile, that there are mechanisms that cause or aggravate injuries (e.g. a gun), and that environmental factors, whether physical or social, can act as protective barriers or increase the risk of exposure to violence. The implication is that there is a range of strategies that can be employed to reduce the incidence of violence. The follow-up<sup>30</sup> to the *World Report on Violence and Health*<sup>1</sup> is one of several texts that summarise the evidence for violence prevention across different ecological contexts (individual, societal, etc.) and violence subcategories (e.g. intimate partner violence) as well as personal developmental stages and was used to develop recommendations for the SA CRA study.<sup>31</sup>

Family and community violence are overwhelmingly perpetrated by men. The use of violence to attain and assert

dominance in interpersonal relationships is a significant feature of masculinity in South Africa and the key challenge in violence prevention is to recognise the central importance of changing men's behaviour. Scientifically evaluated violence-prevention programmes are limited to a handful aimed at the individual and relationship levels, as these interventions are more common, more affordable, easier to design and implement, and also easier to evaluate. Despite the fact that community and societal programmes aimed at curtailing violence are complicated by numerous interacting variables, these programmes must be given serious consideration, as they potentially have far-reaching beneficial effects. We need to implement interventions that are proven to be effective, such as *Stepping Stones*,<sup>23,32</sup> and to strengthen South African research programmes that focus on developing and evaluating a range of interventions seeking to address both the individual and societal aspects of violence.

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