



# THE CERES POPULATION STUDY OF THE INJURY BURDEN, 2008

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**SOUTH AFRICAN MEDICAL RESEARCH COUNCIL**

BURDEN OF DISEASE RESEARCH UNIT

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## **Introduction**

There is very little information on the extent and causes of non-fatal injuries in South Africa, particularly from rural areas. This study was undertaken to collect data about non-fatal injuries in preparation for the second South African National Burden of Disease (NBD) study. The overall aim was to measure the non-fatal injury burden relative to the mortality burden experienced by the Ceres population in 2008/9. This report provides initial findings.

## **Ethics Approval and Permission**

The Medical Research Council's ethics committee reviewed and approved the study proposal in November 2010 (Appendix I). This was followed by approval from the Western Cape Health Research Committee to collect data for the study (Appendix II).

## **Method**

### *Study design*

A retrospective review of folders of injured patients for 2008 was done to provide a cross-sectional profile of the non-fatal injury burden. Data from the Provincial Injury Mortality Surveillance System was obtained for profile of the fatal injury burden.

### *Study population*

The study population comprises the communities living within wards 1, 3, 4, 5 and 6 (Nduli, Ceres, Prince Alfred Hamlet and Bella Vista) (Appendix III; Witzenberg Municipality, 2006), which are served by the Ceres District and Private Hospitals. Patients from outside these wards will be excluded for the estimate of population based rates. For the purpose of this report cases were defined as all first-time injury cases presenting for treatment at Ceres District and Ceres Private Hospitals, which are the only two hospitals in the Witzenberg Municipality (Appendix IV).

### *Sampling*

Previous estimates of the non-fatal injury rates for Ceres indicate considerable uncertainty with one estimate of 16 per 1000 population in 1999 (Matzopoulos, Prinsloo, Butchart *et al*, 2006), and another, based on a rapid assessment, of 37 per 1000 population in 1992 (MRC Trauma Research

Programme, 1992). By applying the lower rate of 16 per 1000, a sample size was calculated with a 50% margin (9-25 per 1000 population) at 95% level of confidence. In order to meet this level of precision for the overall non-fatal injury rate, a sample size of 1081 cases was estimated to be required. The estimated monthly caseload reported by the Delta 9 database indicated that the data for 1 year would meet this requirement. Furthermore, it would be important for the sample to span a full year to capture any seasonal variations. It was decided to include all cases for the year 2008 so as to simplify the collection procedure.

#### *Data collection form*

For the purpose of this study, a data collection form was designed based on blank copies of the type of information kept as records in patient folders at the two hospitals. The categories for the nature of injury were selected from the Global Burden of Disease (GBD) list of injury sequelae (GBD, 2009) to facilitate comparison. The cause of injury list was selected from the WHO collaborative study on alcohol and injuries (WHO, 2001). The data collection form for the Ceres Injury Burden study is shown in Appendix V.

#### **Data collection**

Data collection commenced in November 2010, following the appointment of a retired nurse, who was completely familiar with the area, as a part-time fieldworker. Training of the fieldworker occurred on 25 and 26 November 2010 at Ceres Private and Ceres District Hospitals respectively.

#### *Pilot*

A pilot study was conducted from 25 November to 15 December 2010. The fieldworker reviewed the trauma registers and flagged the injury cases with yellow stickers for withdrawal of the folders. The folders were drawn by admin staff at the Private Hospital, but due to the higher caseload at the District Hospital, an admin clerk had to be appointed by the Medical Research Council (MRC) for this task. The fieldworker retrieved the required information from the patients' folders in order to complete the data collection forms.

A courier was arranged by the MRC to collect the completed data collection forms. The information was reviewed by the Principal Investigator before being captured by a data capturer employed by

the MRC and analysed by the Principal Investigator of the study. Feedback on the quality of the data collected was given to the fieldworker, in order to improve on data quality for the main study.

During the pilot, it was noted that the caseload was higher than anticipated for both hospitals and that the study period would need to be extended. It was also discovered that a slightly different record keeping form was used in the District Hospital in 2008. This did not bring about any major problems with data collection, only in terms of the location of certain data collection items, i.e. blood pressure, temperature and Glasgow Coma Scale (GCS) within the patient folder. It was also identified that neurological status and GCS were poorly completed within the patient folders and there was hardly any indication of whether alcohol was consumed prior to the injury. The data collection form was amended for the main study and these variables were not included. Categories for bruises/soft tissue injuries and lacerations were added to the data collection form for the main study as these were found to occur fairly frequently in the pilot but were not part of the GBD categories.

### *Main study*

The main study commenced after the data collection form was amended and printed, and the fieldworker and admin clerk were appointed on a part-time basis. Data collection started on 7 March 2011 and was completed on 15 November 2011. No major problems were encountered during the main study's time period. The originally planned study time period, however, had to be extended, due to an underestimation of expected number of cases.

Forms were couriered to the MRC where they were reviewed by the Principal Investigator before being captured by a data capturer employed by the MRC. Continuous feedback was given to the fieldworker to ensure data quality.

### **Data analysis**

Basic tabulations were done using Stata 12 to check the data and prepare a descriptive report. Witzenberg had an estimated population of 87 728 in 2006, with a growth rate of 0.6% per year (Witzenberg IDP 2007/2011). The 0.6% growth rate was applied to the 2001 Census population of 38 319 for the selected wards and provided a 2008 study population of 39 958 for Ceres.

## Results

A total of 4438 records were captured for non-fatal injuries that presented to Ceres District and Private Hospitals for first-time treatment in 2008. The large majority (3968) were from the District Hospital with the Private Hospital accounting for 11.0% of cases. Violence-related injuries accounted for nearly half of all injuries treated at the District hospital. Work-related injuries accounted for 55% of injuries treated at the Private Hospital.

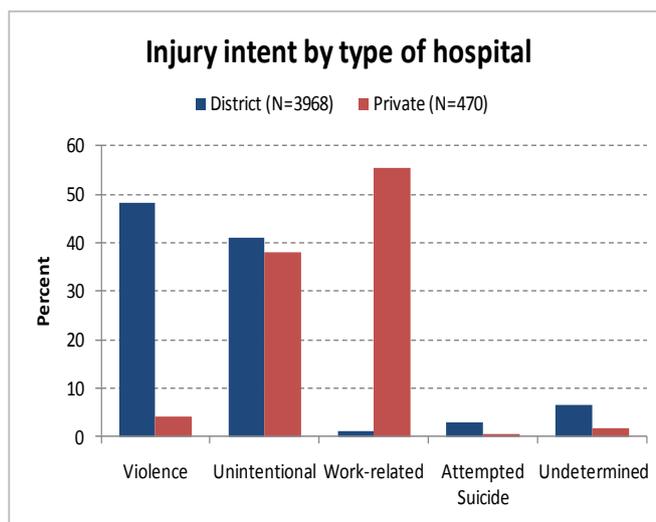


Figure 1: Injury intent by hospital, Ceres 2008 (N= 4438)

At the District Hospital, there were 1.8 male patients for each female patient. The number of males treated for injuries resulting from violence was nearly double that of females. More males were also treated for unintentional injuries. Attempted suicide was more frequent among females; approximately 5.5% of female patients had attempted suicide. Overall, road traffic injuries accounted for 15.5% of unintentional injuries and the specific intent of the injury could not be determined from the medical records for 6.7% of cases.

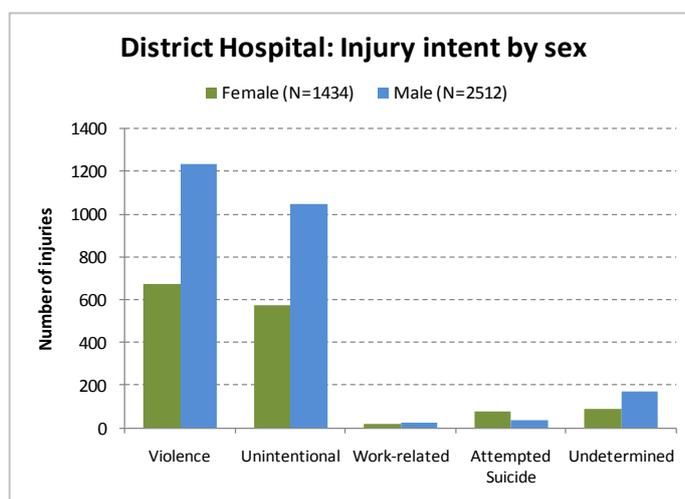


Figure 2: Injury intent by gender, Ceres District Hospital

The profile of injuries for the Private hospital was very different, with very few violence-related injuries. There were 2.8 male patients for each female patient. Males treated for unintentional injuries were more than double that of females, while the number of work-related injuries treated was more than three times higher than females.

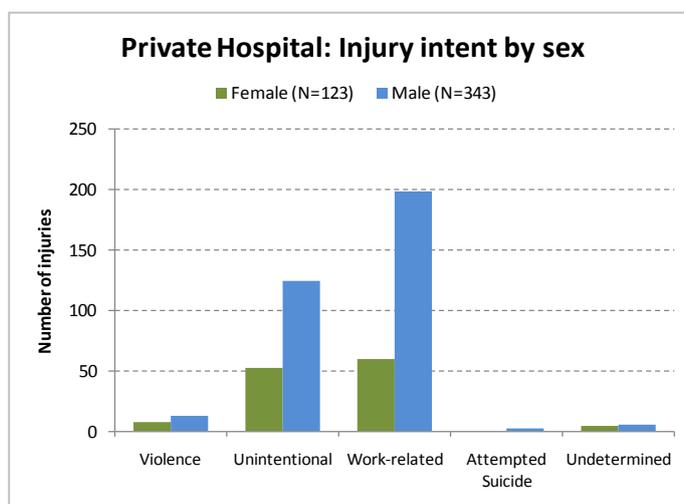


Figure 3: Injury intent by gender, Ceres Private Hospital

## Cause of injury

When the data for both hospitals were combined, unintentional injuries accounted for 48%, intentional injuries for 46% and the intent was undetermined for 6% of injuries. Interpersonal violence accounted for 43%, attempted suicide for 3%, road traffic for 9% and other unintentional injuries for 39% (Figure 4). The specific cause of injury profile indicated that unintentional falls accounted for 22%, followed by sharp force violence (20%), blunt force violence (15%) and road traffic injuries (9%).

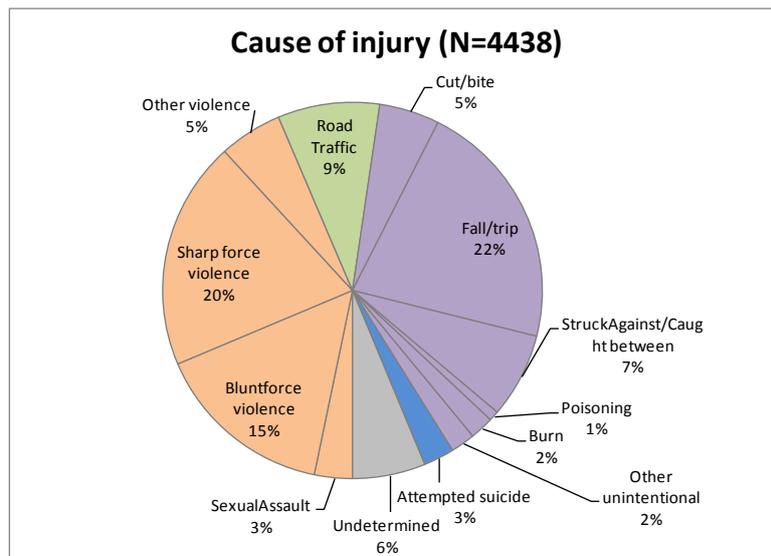


Figure 4: Cause of injury, Ceres 2008 (N= 4438)

Of the 4438 injuries treated, work-related injuries accounted for 307 (6.9%) of the total cases. Figure 5 shows that the main causes of work-related injuries were caused by being struck against/caught between (32%), road traffic (26%) and falls/trips (24%). The majority of the work-related injuries (84.7%) were treated at the Private hospital.

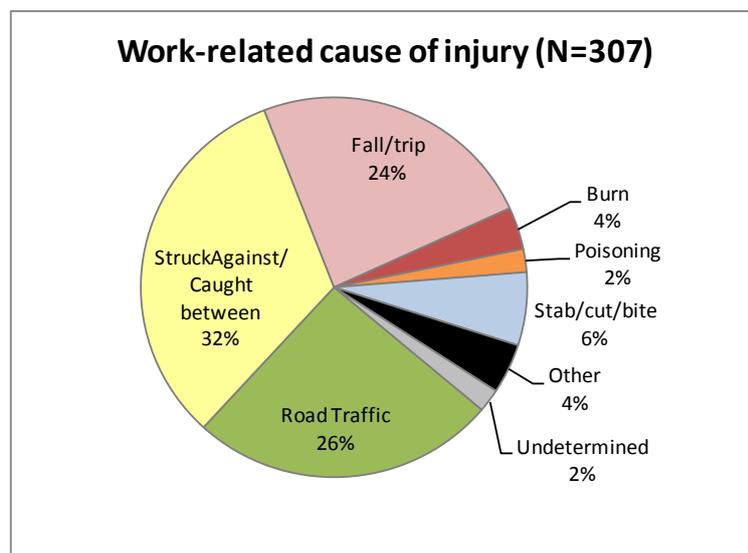


Figure 5: Work-related cause of injury, Ceres 2008 (N= 307)

## Nature of injury

Table 1 shows the nature of injuries treated at the Ceres District and Private Hospitals during 2008. Open wounds or lacerations, soft tissue injuries and fractures were the most commonly treated. The more serious injuries were initially treated and then referred to other hospitals and will be discussed in the section to follow. The District Hospital treated a larger proportion of open wounds/lacerations while the Private Hospital treated a slightly larger proportion of fractures. However, the caseload treated at the Private Hospital was considerably smaller than the District Hospital.

**Table 1: Nature of injury by Hospital, Ceres 2008**

Nature of injury	District Hospital		Private Hospital	
	N*	%	N*	%
Open wound/Lacerations	2055	50.9	197	41.4
Soft tissue	993	24.6	106	22.3
Fractures	490	12.1	77	16.2
Poisoning	138	3.4	8	1.7
Burn	91	2.2	13	2.7
Dislocation	83	2.1	14	2.9
Sprain	75	1.9	18	3.8
Eye	40	1.0	9	1.9
Intracranial	34	0.8	8	1.7
Internal	24	0.6	2	0.4
Amputation	7	0.2	10	2.1
Spinal cord	5	0.1	10	2.1
Nerves/Crushing	2	0.1	4	0.8
<b>Total</b>	<b>4037</b>	<b>100</b>	<b>476</b>	<b>100</b>

\*Some patients had more than one nature of injury recorded.

## Patient placement after treatment

At the District Hospital, 82.8% of patients were discharged (Table 2), approximately 10% admitted and 3% transferred to larger hospitals. The attempted suicide cases had a different profile with 65.8% of cases being admitted and 7% of cases absconding. At the Private Hospital, 74.4% of patients were discharged, while 19.6% were admitted and 5.8% transferred to larger hospitals.

**Table 2: Patient placement by Injury intent, Ceres 2008**

District Hospital						
	Violence	Unintentional	Work-related	Attempted Suicide	Undetermined	Total
<b>Discharged</b>	1592 (83.1)	1401 (86.3)	37 (78.7)	27 (23.7)	226 (85.3)	3287 (82.8)
<b>Admitted</b>	156 (8.2)	135 (8.3)	7 (14.9)	75 (65.8)	18 (6.8)	391 (9.9)
<b>Absconded</b>	106 (5.6)	40 (2.5)	2 (4.3)	8 (7.0)	9 (3.4)	165 (4.1)
<b>Died</b>	0	2 (0.1)	0	0	0	2 (0.1)
<b>Transferred</b>	60 (3.1)	46 (2.8)	1 (2.1)	4 (3.5)	12 (4.5)	123 (3.1)
<b>Total</b>	1910 (100)	1624 (100)	47 (100)	114 (100)	265 (100)	3964 (100)
Private Hospital						
	Violence	Unintentional	Work-related	Attempted Suicide	Undetermined	Total
<b>Discharged</b>	14 (70.0)	147 (82.1)	181 (69.6)	2 (100)	5 (62.5)	349 (74.4)
<b>Admitted</b>	5 (25.0)	20 (11.2)	65 (25.0)	0	2 (25.0)	92 (19.6)
<b>Absconded</b>	0	0	1 (0.4)	0	0	1 (0.2)
<b>Transferred</b>	1 (5.0)	12 (6.7)	13 (5.0)	0	1 (12.5)	27 (5.8)
<b>Total</b>	20 (100)	179 (100)	260 (100)	2 (100)	8 (100)	469 (100)

## Non-fatal Injury Rates: Ceres population, 2008

In order to calculate a population based injury rate, cases from outside of Ceres were excluded from the calculation. Age-specific injury rates were calculated relative to the Ceres population estimate for 2008. Table 3 shows that rates for violence were high among those 15-19 years (26.7 per 1000 population) and among the older adults (43.2 per 1000 population). The unintentional injury rates were highest for children under 5 years (39.4 per 1000 population) but the rates of violence against children under 15 years need to be highlighted. The total rates for violence and unintentional injuries appear to be relatively similar, however it should be noted that transport injuries were included among the unintentional injury category. An overall injury incidence of 67.7 per 1000 population was recorded.

**Table 3: Non-fatal injury rates, Ceres population, 2008**

Injury rates per 1000 population by age group						
	0-4 years	5-14 years	15-19 years	20-59 years	60+ years	Total
<b>Violence</b>	7.6	11.4	26.7	43.2	8.0	28.9
<b>Unintentional</b>	39.4	29.3	21.3	28.3	19.4	28.3
<b>Work-related</b>	0.0	0.0	2.7	7.1	1.4	4.1
<b>Attempted suicide</b>	0.0	0.7	4.8	2.0	0.0	1.7
<b>Undetermined</b>	2.5	3.8	3.4	5.0	1.0	4.0
<b>All cause</b>	49.6	45.2	58.9	85.6	29.8	66.9*

\*The injury incidence rate of 66.9 reflects the rate for the number of cases for which age was known. The true overall injury incidence of 67.7 per 1000 population was calculated on the total number of cases recorded for the Ceres population in 2008 (N= 2704).

### Fatal/Non-fatal Injury comparison

Figure 6 compares the non-fatal and fatal injury profile for the town of Ceres in the year 2008. While there were fewer deaths than non-fatal, the proportions of fatal and non-fatal violence were similar (44%). However, a larger proportion of road traffic injuries were fatal (23%) compared to non-fatal (7%), and more unintentional injuries were non-fatal (34%) compared to 11% of unintentional injury deaths. Self-inflicted injuries accounted for a higher proportion of the fatal injuries (13%) compared to non-fatal injuries (6%). When the ratios for non-fatal to fatal injuries were compared, there were 37.8 non-fatal violence-related injuries for every violent death, 12.3 non-fatal road traffic injuries for each road traffic death, 7.6 non-fatal self-inflicted injuries for each suicide and 137.9 other unintentional injuries for every unintentional death. Overall there were 38.6 non-fatal injuries for every injury death in Ceres. For a small proportion of fatal and non-fatal injuries the cause was undetermined.

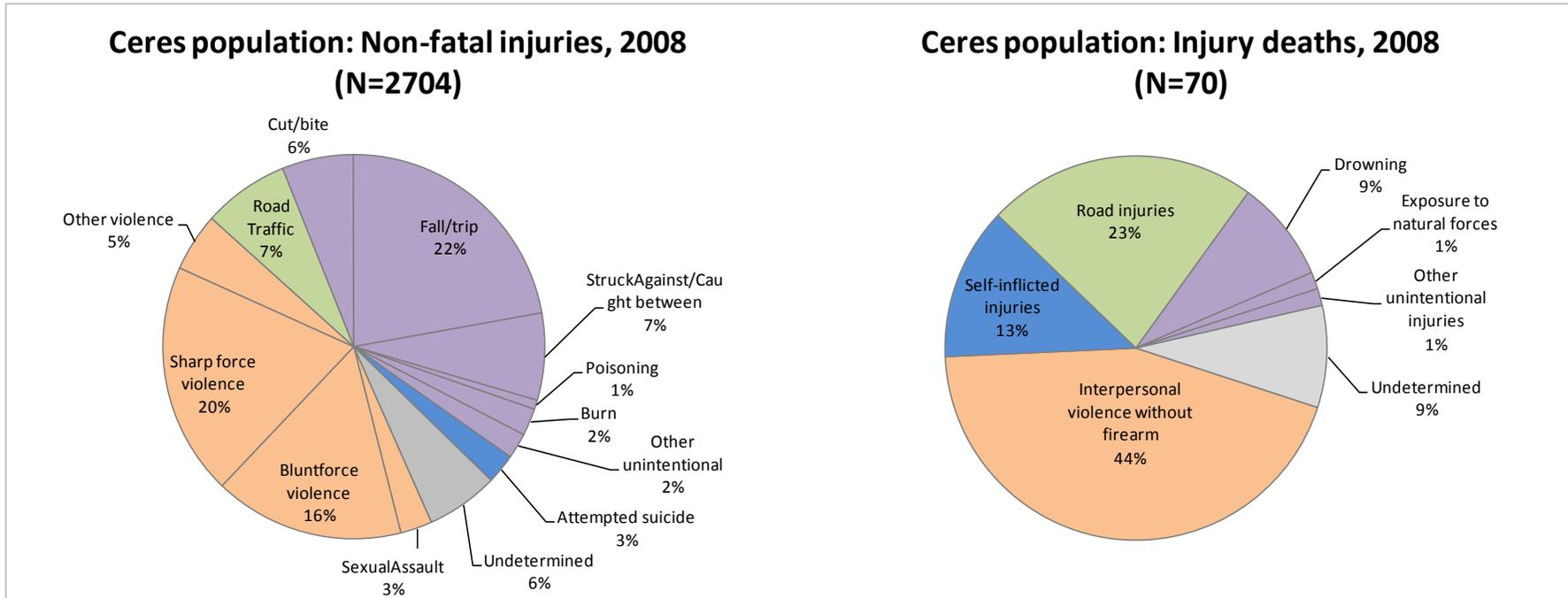
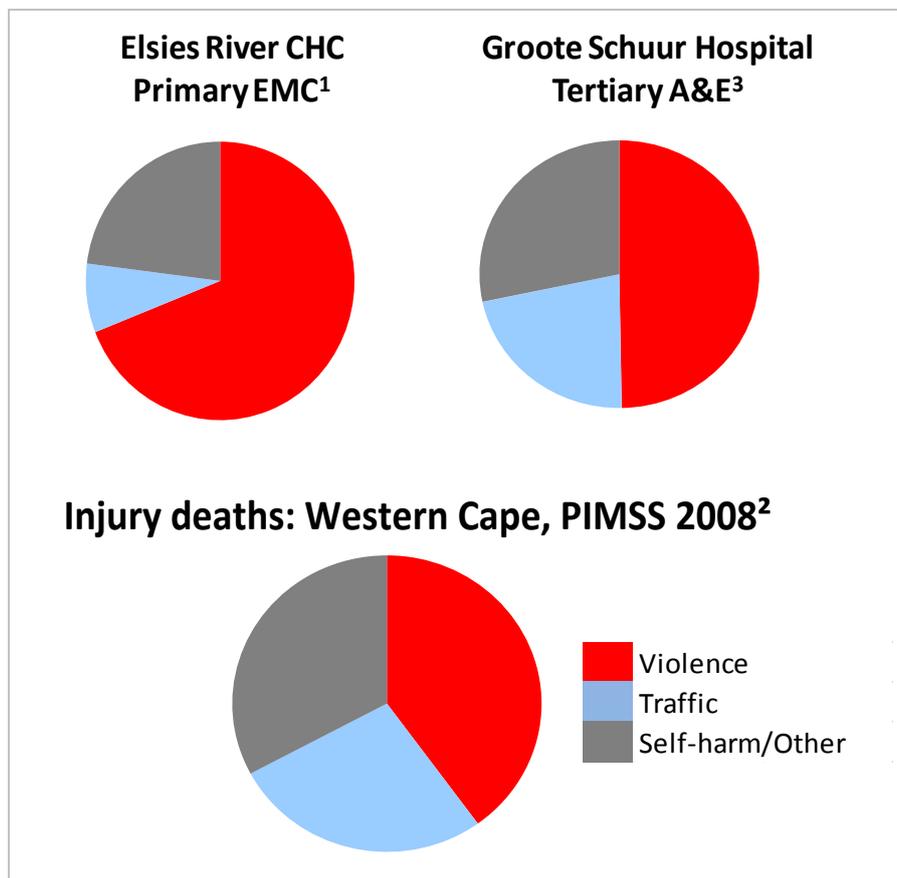


Figure 6: Cause of non-fatal and fatal injury comparison, Ceres population, 2008

## Urban/rural Injury comparison

Figure 7 shows the proportion of non-fatal violence, traffic and self-harm, which was grouped with other unintentional and undetermined injuries for Elsie's River Community Health Centre for a pilot study capturing data from 25 November to 5 December 2010 and Groote Schuur Hospital for the month of October 2008. A comparison of the non-fatal injuries shows that patients reporting to Elsie's River and Groote Schuur Hospitals (Figure 7) had a higher proportion of non-fatal violence than those in the Ceres population (Figure 6). The proportions of traffic-related injuries were similar for Ceres and Elsie's River, while Groote Schuur Hospital treated a higher proportion of traffic-related injuries than the two smaller health facilities. When the injury deaths for the Ceres population (Figure 6) were compared with deaths in the Western Cape (Figure 7), the proportions of violence and traffic-related deaths were similar. This indicates that there appears to be differences in non-fatal injuries between the rural Ceres population and larger urban areas, while the profile for injury deaths between Ceres and the broader Western Cape did not differ greatly during 2008.



**Figure 7: Non-fatal Injuries, Elsie's River and Groote Schuur Hospitals vs Injury deaths, Western Cape**

Sources: 1. Matzopoulos R, Govender I, Makanga P, Corrigan J. Violence and alcohol: the injury profile at the Elsie's River Community Health Centre. *1st Conference of the UCT Safety and Violence Initiative (SaVI): Promoting safety, reducing violence, raising awareness. Cape Town, 8-9 September 2011*; 2 *Western Cape Provincial Injury Mortality Surveillance System: Annual Report 2008*; 3. Schuurman N, Cinnamon J, Matzopoulos R, Fawcett V, Nicol A, Hameed SM. Collecting injury surveillance data in low and middle income countries: the Cape Town trauma registry pilot. *Global Public Health* 2010 ePub(ePub): 1-16.

## Discussion

The overall cause of injury patient profile indicates that falls, sharp-and blunt-force violence and road-traffic injuries were the leading injuries treated at the two hospitals in Ceres. Consequently, open wounds/lacerations, soft tissue injuries and fractures were most common injuries treated at both hospitals. Patient placement after treatment differed for the two hospitals. The District Hospital treated a large number of patients and had difficulty in accommodating in-hospital stays due to the size of the wards and available beds. Approximately 10% of patients treated were admitted to the District Hospital and 3% were transferred to larger hospitals. At the Private Hospital, nearly 20% were admitted and 6% transferred to larger hospitals. Overall, transfers occurred for injuries of a more serious nature, in particular fractures, spinal cord and intracranial injuries, eye injuries, burns and open wounds.

The observed injury incidence of 67.7 per 1000 population is higher than the 16 per 1000 population in 1999 (Matzopoulos, Prinsloo, Butchart *et al*, 2006), or the 37 per 1000 observed in 1992 (MRC Trauma Research Programme, 1992). The violence rate of 28.9 in Ceres was slightly higher than the unintentional injury rate of 28.3, which also included transport injuries. Violence rates were highest among young and older adults, and the gender profile indicated high levels of violence for males in Ceres and the surrounding areas. Unintentional injuries were high for children under 15 years, but the rate for violence among this age group is cause for concern. Also of concern is the rate of attempted suicides among the 15-19 year age group. Attempted suicides were more common among females and a higher percentage was treated at the District Hospital.

Limited data on injury incidence is available on a national and international level. However, a comparison of the Ceres injury incidence rate of 67.7 per 1000 population with studies from the literature showed that the overall rates were fairly similar. The Ceres injury incidence rate is slightly lower than the urban injury incidence rate of 74.7 per 1000 population for patients 15 years and older who presented to emergency departments in Barcelona (Plasència & Borrell, 1996). A community-based study in Tanzania reported an injury incidence of 72 per 1000 population, based on a one-month recall period (Moshiro *et al*, 2005) and a household survey in Iran reported an injury incidence of 68.8 per 1000 population (Saadat *et al*, 2011). While these studies had different methods of data collection and recorded various severities of injury, it provides some indication of the non-fatal injury incidence rate, since South African rates are not readily available.

The high proportion of work-related injuries treated at the Private hospital is expected, considering the farming activities within the Ceres area and the fact that work-related injuries are funded by the Workman's Compensation Act. However, the large proportion of falls, machinery accidents (struck

against/caught between) and transport-related injuries can be prevented by improving safety practices within the work environment.

A comparison of the non-fatal to fatal injury ratio for the Ceres population indicated that road traffic injuries and self-inflicted injuries had smaller ratios of 12.3 and 7.6 respectively. It was 137.9 for other unintentional injuries and 37.8 for violence. This shows that road traffic and self-inflicted injuries were more likely to be fatal but the high levels of violence cannot be overlooked. Unlike urban areas, firearms were involved in a very small number of violence-related injuries and the nature of the injury indicates that sharp objects and blunt trauma were mostly the cause of injury.

### **Study limitations**

Injuries taken to Worcester hospital and serious injuries taken to Tygerberg hospital have not been followed-up. Where possible, information on the injury was recorded from the patients' folders before transfer to other hospitals occurred. However, some injuries could have been transferred directly to other hospitals via the emergency services and hence not captured. Another limitation is that no information on alcohol could be recorded from the patients' folders. This was due to the study being retrospective and a possible recommendation could be that this information be routinely collected, in particular for violence and road traffic injuries and followed-up with brief motivational interviewing. The high rates of violence highlights the need for further research on perpetrators and the socio-economic context of violence.

### **Recommendations**

Adequate intervention and prevention methods could reduce these injuries and hence reduce the number of lacerations, soft-tissue injuries, fractures and other serious injuries treated at the District and Private Hospitals. This study has identified high levels of violence for both males and females, violence against children, sexual assault and high levels of violence among the youth and young adults. Appendix VI lists promising and effective interventions for violence prevention based on a review of the literature (Matzopoulos, Bowman, Mathews *et al*, 2010). These are multi-sectoral and are aimed at reducing income inequality, improving the criminal justice and social welfare systems, changing cultural norms and strengthening communities. Some of the interventions which can be directly applied to the risks identified by this study include the following:

- Home visitation and treatment programmes for victims of child maltreatment and also for children who witness interpersonal violence.
- Academic and sport enrichment programmes and scholarships should be encouraged at school-level to occupy and motivate the youth.
- Access to crisis centres for women who are raped and abused needs to be facilitated.

- Treatment programmes aimed at changing the behaviour and beliefs of young men with regards to gender-based violence and violence in general are needed.
- Alcohol-abuse is an additional contributing risk factor to violence that needs to be identified and treated to reduce the burden of violence among communities.

### **Next steps of this study**

- To determine the injury mortality profile by age, sex and cause from the mortality surveillance data.
- To determine the ratio of non-fatal burden to premature mortality (YLD to YLL ratio) for each cause of injury by sex for the National Burden of Disease study.

## Acknowledgements

The Western Cape Health Research Committee for permission to conduct the study

Dr Lizette Phillips (Cape Winelands Health Services), Dr Carlo Prins (Ceres District Hospital) & Ms Tania Zeeman (Ceres Private Hospital) & associated staff for access and assistance

Mrs Marica du Toit for data collection

Mrs Amanda Fourie, MRC Biostatistics for data capture

Ms Nicole Cupido & Ms Corné Cronje for drawing folders

## References:

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## Appendix I: MRC Ethics approval letter



### ETHICS COMMITTEE

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<http://www.sahelthinfo.org/ethics/ethics.htm>

2 December 2010

Ms M Prinsloo  
Burden of Disease Research Unit  
MRC Cape Town

Dear Ms Prinsloo

**Protocol ID:** EC10-018  
**Protocol title:** The Ceres population study of the injury burden  
**Meeting date:** 29 November 2010

Thank you for your application to the Ethics Committee, which was discussed at the November 2010 meeting. I am pleased to inform you that ethics approval was granted for the study.

Wishing you well with your research.

Yours sincerely



**PROF. D DU TOIT**  
**CHAIRPERSON: MRC ETHICS COMMITTEE**

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**MRC Ethics Committee:** Prof D du Toit (chairperson), Prof A Dhai, Dr N Khaole, Dr NE Khomo, Prof D Labadarios, Prof DL Mkize, Ms L Mpahlwa, Prof H Oosthuizen, Dr L Schoeman, Prof AA van Niekerk



## Appendix II: Western Cape Health Research Committee approval letter

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# DEPARTMENT of HEALTH

Provincial Government of the Western Cape

### COMPONENT

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REFERENCE: 18/19/RP131/2010  
ENQUIRIES: Dr N Peer

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Medical Research Council  
P.O. Box 19070  
Tygerberg  
7505**

Fax: (021) 938 0310

**For attention: Megan Prinsloo**

### The Ceres Population Study of the Injury Burden

Thank you for submitting your proposal to undertake the above-mentioned study. We are pleased to inform you that the department has granted you approval for your research. Please contact the following members of staff to assist you with access to the facilities:

<b>Ceres District Hospital</b>	Dr Carlo Prins	(023) 316 9628
<b>Ceres EMS</b>	Dr Shaheem De Vries	<a href="mailto:sdevries@pgwc.gov.za">sdevries@pgwc.gov.za</a>

Kindly ensure that the following are adhered to:

1. Arrangements can be made with managers, providing that normal activities at requested facilities are not interrupted.
2. Researchers, in accessing provincial health facilities, are expressing consent to provide the department with an electronic copy of the final report within six months of completion of research. This can be submitted to the provincial Research Co-ordinator ([healthres@pgwc.gov.za](mailto:healthres@pgwc.gov.za)).
3. The reference number above should be quoted in all future correspondence.

We look forward to hearing from you.

Yours sincerely

**DR J CUPIDO**

The Afrikaans or Xhosa version of this document is available on request.

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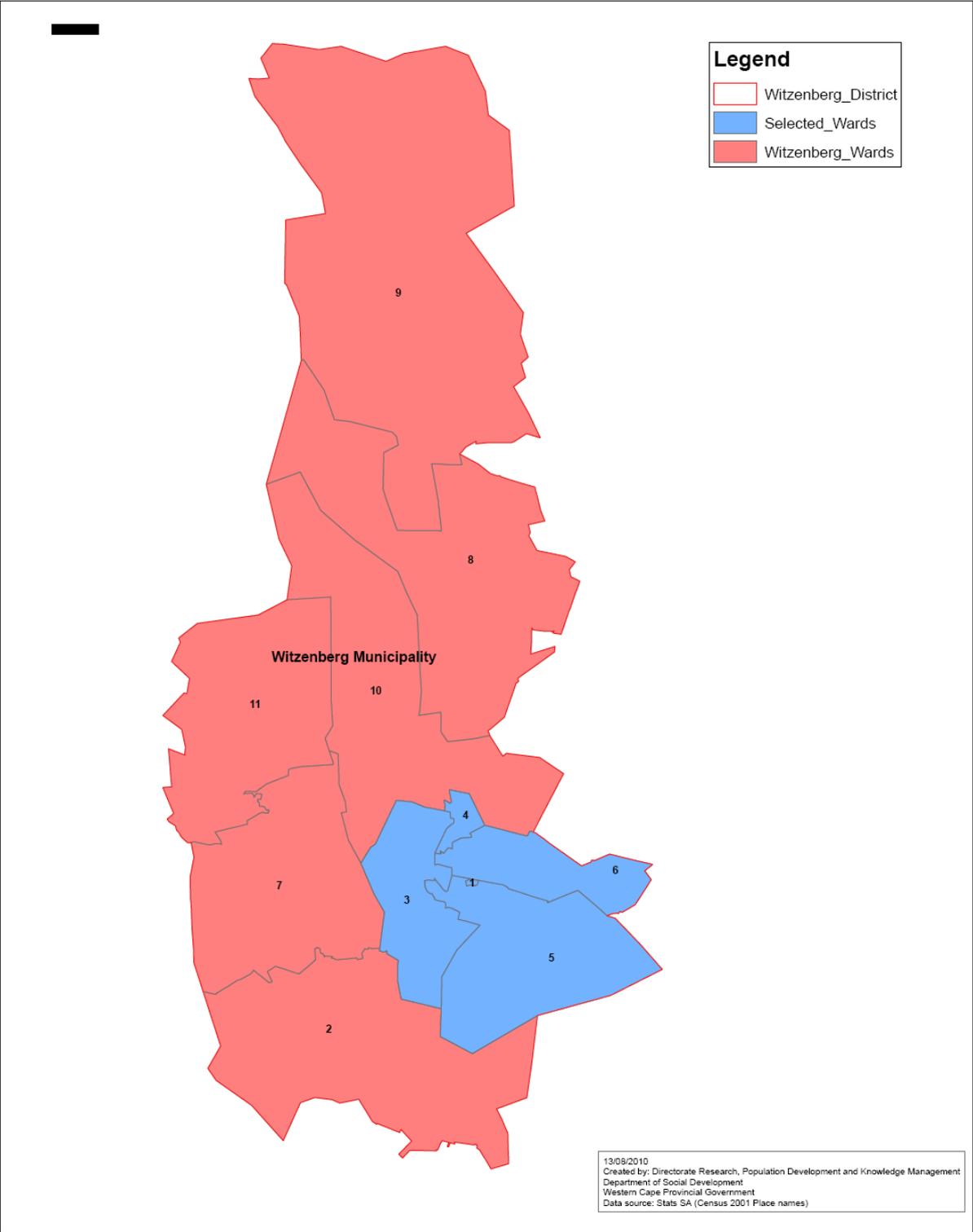
  
DEPUTY DIRECTOR GENERAL  
DISTRICT HEALTH SERVICES AND PROGRAMMES  
DATE: 24/11/2010

CC: DR L PHILLIPS

DIRECTOR: CAPE WINELANDS DISTRICT

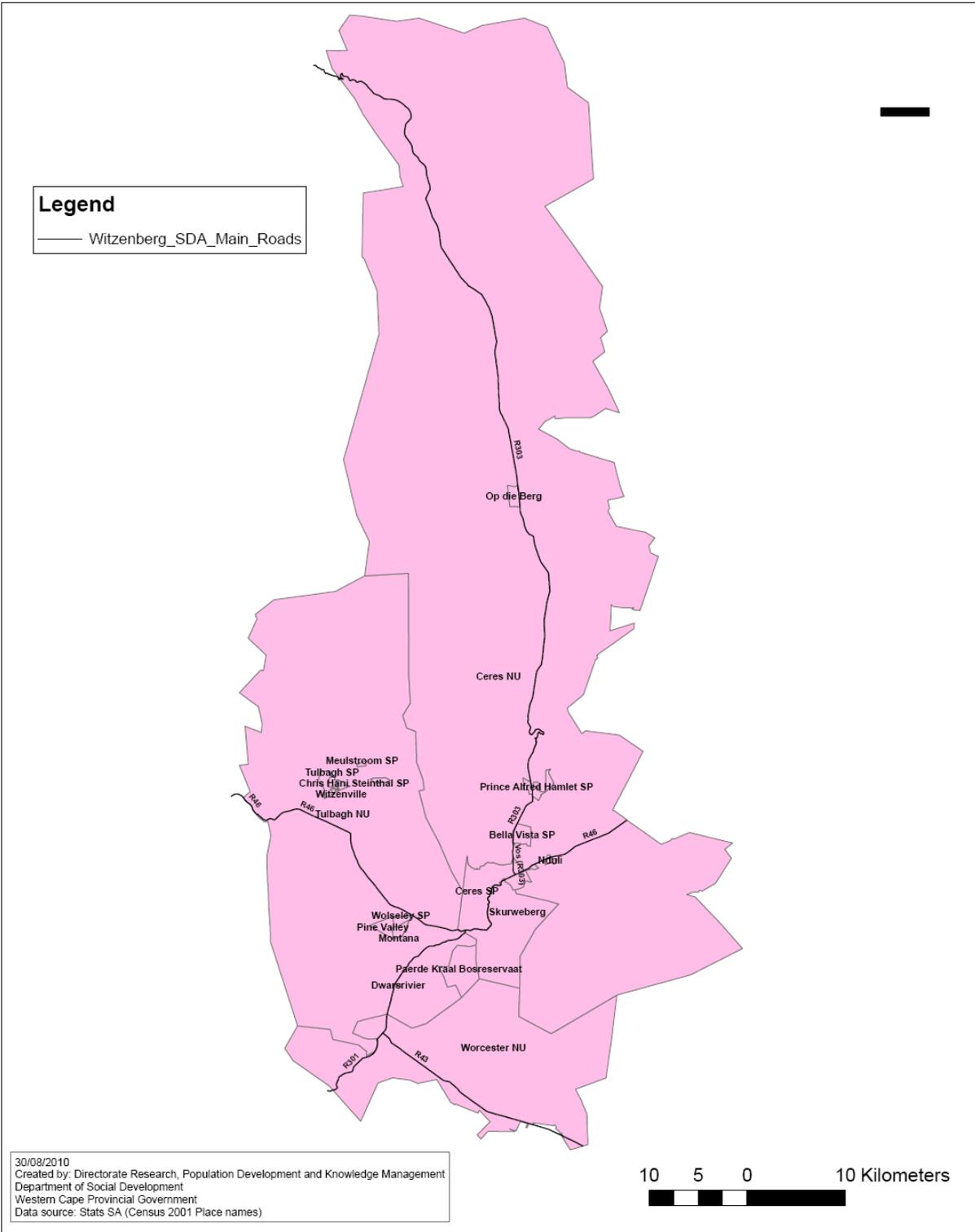
Appendix III: Selected wards for MRC Ceres population study of the injury burden

## Witzenberg Wards and District Boundaries



**Appendix IV: All injured patients presenting to Ceres District and Private hospitals included for this report**

**Witzenberg SDA**





**PLACEMENT AFTER TREATMENT**

- 1 Discharge
- 2 Admit to: \_\_\_\_\_
- 3 Absconded
- 4 Dead
- 5 Transfer to: \_\_\_\_\_

**EXPECTED TIME AWAY FROM WORK/  
OUT OF ACTION**

- 1 None
- 2 < 1 week
- 3 1-3 weeks
- 4 4-6 weeks
- 5 7-12 weeks
- 6 > 12 weeks
- 7 Unknown

**EXPECTED TIME AWAY FROM WORK ASSESSED BY**     1 Doctor     2 Fieldworker

**DISABILITY**     1 Short-term     2 Long-term     3 No     4 Dead     5 Unknown

**INJURY EVENT DETAILS**

**Cause of Injury**

- |  |   |
|--|---|
| <input type="checkbox"/> 1 Being hit by a vehicle (as a pedestrian)      | <input type="checkbox"/> 9 Choking, hanging                         |
| <input type="checkbox"/> 2 Being in a vehicle collision (as a driver)    | <input type="checkbox"/> 10 Fall, trip                              |
| <input type="checkbox"/> 3 Being in a vehicle collision (as a passenger) | <input type="checkbox"/> 11 Struck against/Caught between           |
| <input type="checkbox"/> 4 Being in a vehicle collision (unspecified)    | <input type="checkbox"/> 12 Drowning/Near drowning                  |
| <input type="checkbox"/> 5 Sexual assault                                | <input type="checkbox"/> 13 Poisoning                               |
| <input type="checkbox"/> 6 Blunt force assault                           | <input type="checkbox"/> 14 Burn with fire, flame, heat, hot liquid |
| <input type="checkbox"/> 7 Gunshot                                       | <input type="checkbox"/> 89 Other (specify) _____                   |
| <input type="checkbox"/> 8 Stab, cut, bite                               | <input type="checkbox"/> 99 Unknown                                 |

**Injury Intent**

- 1 Violence/Intentional
- 2 Unintentional
- 3 WCA - Unintentional
- 4 Self-inflicted/Attempted suicide
- 5 Legal intervention
- 6 Undetermined

**FIELDWORKER COMMENTS**

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**Appendix VI: Promising and effective interventions for violence prevention\***

Possible Violence Interventions	Target of intervention
<b>Reducing income inequality</b>	
<ul style="list-style-type: none"> <li>➤ Job-creation programmes for the chronically unemployed for ages 20 and older</li> <li>➤ Poverty reduction</li> <li>➤ Housing density and residential mobility programmes</li> <li>➤ Micro-finance projects for women</li> <li>➤ Improved police and judicial systems to ensure more equitable access, protection, and legal recourse for victims, witnesses and suspects, and more efficient investigation and judicial procedures</li> </ul>	Distal
<b>Improving the criminal justice and social welfare systems</b>	
<ul style="list-style-type: none"> <li>➤ Easier access to social support for women and families</li> <li>➤ Further legislation to criminalise the maltreatment of children, intimate-partner violence, and elder abuse</li> <li>➤ Mandatory arrest for intimate partner violence</li> <li>➤ Improve services for children who witness violence;</li> <li>➤ Safe havens for children on high-risk routes to and from school</li> <li>➤ Shelters and crisis centres for battered women and elder abuse victims</li> </ul>	Distal
<ul style="list-style-type: none"> <li>➤ Treatment programmes for victims of maltreatment for children aged 0 to 3 years</li> <li>➤ Services for adults who were abused as children for ages 20 and older</li> <li>➤ Treatment for child and intimate-partner abuse offenders for ages 20 and older</li> <li>➤ Screening by health-care providers for the identification and referral of high-risk youth, battered women, victims of elder abuse, child maltreatment, and sexual violence</li> </ul>	Proximal
<b>Changing cultural norms</b>	

<ul style="list-style-type: none"> <li>➤ <u>Mobilise women’s community networks to challenge prevailing aggressive norms and beliefs to reduce tolerance of violence, and to teach perpetrators to fear the consequences of their actions</u></li> <li>➤ <u>Work with young men to change their attitudes and behaviour with regard to gender-based violence and violence in general</u></li> <li>➤ Campaigns to increase public awareness of child maltreatment</li> <li>➤ “Name and shame” intimate-partner violence offenders</li> <li>➤ Adult recreational programmes</li> <li>➤ Community policing</li> <li>➤ Reduce the glorification of violence in popular media, including television, film and computer games</li> <li>➤ Public information campaigns to promote pro-social norms for children aged 9 to 11 years</li> <li>➤ Change cultural norms that support violence, such as those that support male dominance over females; parental dominance over children; and violence as a means of conflict resolution</li> </ul>	Distal
<ul style="list-style-type: none"> <li>➤ <u>Encourage and expand life-skills training programmes</u></li> <li>➤ Reduce unintended pregnancies (aimed at preventing violence against children aged 0 to 3 years)</li> <li>➤ Recreational programmes for children aged 3 to 19 years</li> <li>➤ Peer mediation or peer counselling for children aged 12 to 19 years</li> </ul>	Proximal
<b>Strengthening communities</b>	
<b><i>Alcohol</i></b>	
<ul style="list-style-type: none"> <li>➤ Implement a coherent liquor-outlet policy which brings informal outlets into the regulated market;</li> <li>➤ Community mobilisation against alcohol misuse</li> <li>➤ Norms/guidelines for school-based programmes based on best practice</li> <li>➤ Product restrictions, e.g. on size of packaging and clearer, legible labels regarding content</li> <li>➤ Restrict products that appeal to youth</li> <li>➤ Reduce alcohol availability for ages 12 years to 19 years</li> <li>➤ Establish integrated programmes that address alcohol and substance abuse alongside other violence-prevention initiatives</li> </ul>	Distal
<ul style="list-style-type: none"> <li>➤ Pilot and implement brief interventions for high-risk and hazardous drinkers</li> </ul>	Proximal

<p><b>Education and childcare</b></p> <ul style="list-style-type: none"> <li>➤ <u>Programmes which provide youths with incentives to complete secondary schooling;</u></li> <li>➤ <u>School-based prevention programmes aimed at reducing date-related violence</u></li> <li>➤ Introduce child-protection service programmes</li> <li>➤ Improve school settings for children</li> <li>➤ Install metal detectors in schools for children aged 3 to 19 years</li> </ul>	Distal
<ul style="list-style-type: none"> <li>➤ <u>Introduce social development programmes for children between the ages of 3 and 19 years</u></li> <li>➤ <u>Encourage academic enrichment programmes for children aged 12 to 19 years</u></li> <li>➤ Introduce temporary foster-care programmes for chronic delinquents for children aged 12 to 19 years</li> </ul>	Proximal
<p><b>Firearms</b></p> <ul style="list-style-type: none"> <li>➤ Enforce longer waiting periods for firearm purchases</li> <li>➤ Hold gun-owners liable for damage caused by gunfire</li> <li>➤ Promote the safe storage of firearms and other lethal weapons</li> <li>➤ Enforce laws which prohibit the illegal transfers of guns to youth</li> </ul>	Distal
<b>Investing in early childhood education</b>	
<ul style="list-style-type: none"> <li>➤ <u>Lead monitoring and toxin removal</u></li> <li>➤ Increased access to pre- and post-natal care for children aged 0 to 3 years</li> <li>➤ Multi-context, long-term interventions that impact on multiple dimensions of a child's environment</li> <li>➤ School-feeding schemes to ensure adequate nutrition in all grades throughout the schooling years</li> </ul>	Distal
<ul style="list-style-type: none"> <li>➤ <u>Introduce therapeutic foster care for children aged 0 to 3 years</u></li> <li>➤ <u>Implement preschool enrichment programmes for children aged 3 to 11 years</u></li> <li>➤ <u>Introduce home visitation aimed at reducing violence directed at children aged 0 to 3 years</u></li> <li>➤ <u>Provide training for young parents aimed at reducing violence among children aged 0 to 5 years</u></li> <li>➤ <u>Hospital-based, parent education programme to reduce the incidence of abusive head injuries among infants and children</u></li> <li>➤ Provide mentoring for children aged 3 to 11 years</li> <li>➤ Implement school-based child-maltreatment prevention programmes for children aged 3 to 11 years</li> </ul>	Proximal
<b>Increasing positive adult involvement</b>	

➤ Incentives for young adults and high-risk youths to complete high school and post-secondary education or vocational training	Distal
➤ <u>Provide mentoring for children aged 12-19 years</u> ➤ <u>Provide family mentoring for families with children aged 12-19 years</u> ➤ Introduce home-school partnership programmes to promote parental involvement for children aged 3 to 11 years ➤ Provide after-school programmes to extend adult supervision for children such as wilderness programmes and other outdoor programmes for youth at risk	Proximal

\*Effective interventions are underlined.

Source: Matzopoulos, Bowman, Mathews *et al*, 2010.