INJURY IN SELECTED PERI-URBAN SETTLEMENTS IN THE WESTERN CAPE, SOUTH AFRICA

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Abstract

The article investigates the injury rates and patterns reported in a peri-urban setting located in the Western Cape region of South Africa. Peri-urban South African settings are often marked by poverty, unemployment and crime. While there has been some injury research in metropolitan South Africa, there is a paucity of injury data for settlements on the periphery of the city centres. This article reports on a household study conducted in a cluster of peri-urban communities in the Western Cape. Over a one-year period up to June 1998, 4.8% of the study population (95% confidence interval 3.9% to 5.8%) reported an injury. The majority of injuries were due to traffic crashes (23%), falls (18%), violence (17%), and burns (7%), with a further 17% due to other injuries such as poisoning and sports activities. Injuries were mostly sustained in the neighbourhoods themselves, and in or around the respondents' homes. High-risk times for injury were in the afternoons, over weekends, and over the months of April, October, June and December. Most injuries were sustained by males (69.79%) and in the 30 to 39 year and the birth to 4-year age groups. These neighbourhood injury risk profiles and indicators provide an information base for the development of injury and trauma prevention and containment initiatives, and may assist in the implementation of similar projects in other peri-urban settings.

Key words: peri-urban settlements, household surveys, injury epidemiology, prevention

Résumé

L'article examine l'épidémiologie des blessures qui ont lieu un village à la périphérie d'une ville dans la région à l'ouest du Cap en Afrique du sud. Ces villa-
ges sud-africains souffrent souvent de la pauvreté, du chômage et du crime. Alors qu’il y a eu des enquêtes faites sur les blessures dans les grandes villes sud-africaines, il y a un manque d’informations sur celles qui se produisent dans les villages à proximité des centres urbains. Cet article fait état de l’étude menée dans les ménages au sein d’un ensemble de plusieurs communautés installées à proximité de villes dans la région à l’ouest du Cap. Pendant un an, jusqu’en juin 1998, 4.8% de l’étude démographique (95% intervalle de confiance 3.9% à 5.8%) ont signalé une blessure. 23% des blessures présentées étaient dûes à des accidents de la circulation, 18% à des chutes, 17% à des crimes de violence, 7% à des brûlures et 17% à d’autres blessures comme des empoisonnements ou des blessures survenues dans des activités sportives; elles ont été recues dans les voisinsages mêmes soit chez les personnes interrogées ou dans les parages. Les périodes à haut risqué pour ces blessures sont les après-midi, pendant les weekends et pendant les mois d’avril, octobre, juin et décembre. Ce sont surtout les hommes (69.79%), de 30 à 39 ans et de la naissance à 4 ans, qui ont permis de développer des méthodes de prévention et d’initiatives de limitation et peut aider à l’exécution d’enquêtes analogues dans d’autres villages du même type.

**Mots clés:** villages à la périphérie des villes, enquête dans les ménages, épidémiologie des blessures, prévention

**Introduction**

According to the World Health Organisation (WHO), physical injury may be defined as follows:

> Injury is a bodily lesion at an organic level resulting from acute exposure to energy (this energy can be mechanical, thermal, electrical, chemical or radiant) interacting with the body in amounts that exceed the threshold of physiological tolerance. In some cases an injury results from an insufficiency of any of the vital elements (in drowning, strangulation, or freezing) (WHO, 1998, pp.110-111).

Injuries may be classified according to two broad classes: intentional injuries, which result from violence or are self-inflicted, and unintentional injuries, which are often referred to as “accidental” and are usually due to transport crashes, drowning, falls and burns. The latter incidents may however also be associated with an intentionally inflicted injury if the crash, burning, fall, or drowning incident is perpetrated by an individual or group with the intention to harm another individual. The term “injury” should not be confused with “trauma”, which is also used to describe the psychological consequences of physical injury, and is more closely associated with the work conducted by psychological counselling and emergency medicine (Butchart & Kruger, 2001). “Unintentional injury” is also preferred to “accident”, to counter the notion that injurés are due to fate or
other unpredictable events (Laflamme, Svanstrom & Schelp, 1999). Over and above the immediate physical ramifications of the injury, including physical pain and possible disability or death, there may be a range of psychological, social and economic consequences for the injured individuals and their families. By their very nature, injuries and especially deaths from injury are usually not expected by victims and their families, and may thus be associated with considerable trauma to individuals, families and communities (Laflamme, Svanstrom & Schelp, 1999).

The social components to these losses include deterioration in family and economic well being, especially if the family has suffered the death or incapacitation of a primary breadwinner (Barss, Smith, Baker & Mohan, 1998; Laflamme, Svanstrom & Schelp, 1999). The attendant societal and economic losses, especially related to young adults who sustain injury-related death and disability, are considered astronomical. There is an enormous drain on social support and health systems via the costs of injury treatment services such as trauma care, rehabilitation, and disability support services. There is also the loss of the individual’s future social and economic contribution, and the permanent loss of the usually considerable material and human resources already invested in education and development (Barss, Smith, Baker & Mohan, 1998).

Despite the considerable international recognition of injury as a public health priority, the focus on injury prevention is relatively recent. In many countries, efforts to understand and prevent the injury problem have been restrained by a lack of reliable and detailed information on the incidence, intent, mechanism and outcomes of injuries. Research on the occurrence of injuries have demonstrated that they are not randomly distributed, but follow distinct patterns, differing between countries, communities, neighbourhoods, and according to social sectors defined by gender, age, income and occupation (Berger & Mohan, 1996; Laflamme, Svanstrom & Schelp, 1999). In South Africa, disproportionately high risks to injury have consistently been reported amongst historically socially disadvantaged individuals, groups and communities, namely the poor, children, youth, women and the unemployed (Kruger, Butchart, Seedat & Gilchrist, 1996). These risks have been associated with the concentrations of poverty and disadvantage, predominantly located amongst black, working class communities resident in townships, and rural and peri-urban settings (1). Between 40% to 50% of the South African population is categorised as poor, with many of these poverty zones to be found in the informal shack settlements on the outskirts of the

1 In this chapter, we use the term ‘black’ to refer to the groups that were previously disenfranchised by South African legislation. Use of this term does not imply acceptance of the racist assumptions on which this label is based. Instead, it should be seen as a reflection of the differential manner in which earlier South African policies of racial segregation, or apartheid, had impacted, and still does, on the lives of various groups of South Africans.
wealthier metropolitan centres. Informal housing areas are residential areas occupied with government approval, but usually unplanned and with no formal tenure arrangement. Many of these areas are seen as temporary residential sites, and have some basic, usually communal services such as water, sanitation and refuse removal. These settlements are often environmentally degraded, have limited recreational facilities, and widespread overcrowding, all of which compromise health and safety (Mazur & Qangule, 1995). Since the late 1980s, informal, peri-urban settlements have rapidly expanded as a consequence of natural urban population growth, labour migrancy, the extreme formal housing shortages, and the influx of previously rural people (Huggins, 1992). It is currently estimated that nearly 5 million, or 1 in 8 South Africans currently live in approximately 1010 informal settlements (Minister of Water Affairs and Forestry, 2002).

Despite the potential public health threats associated with these settings and a recently increased focus on the epidemiology of injury in South Africa, there remains very little injury data for peri-urban settlements in South Africa (Peden, Butchart & Burrows, 2000; National Trauma Research Programme, NTRP, 1994; Violence and Injury Consortium, 2000). This is particularly emphasized for non-fatal injury, for which there remains a dearth of information (NTRP, 1994; Van Niekerk, Bulbulia & Seedat, 2000). This paucity of information on the magnitude, extent and patterns of injury mortality and morbidity, makes it difficult to define the injury risks, determinants, and costs in these settings. Without this information database, the platform required for injury prevention and control is limited and has arguably curtailed the development of effective injury prevention and control initiatives in these settlements, paradoxically where the highest risks to injury are reported to reside (Butchart, 1996).

Aims

This report details the findings of a household-based study, which examined the epidemiology of injury among residents in three adjacent peri-urban neighbourhoods in the Helderberg municipality in the Western Cape. Nineteen percent of all households in the Western Cape reside in informal dwelling structures or shacks (Cape Metropolitan Council, 2001). The selection of the three peri-urban sites in the Helderberg was based on the recent emergence of these settlements, their proximity to the participating research institution, and the willingness of their respective representative organisations to support and participate in an injury prevention initiative.

In this paper we provide a description of the physical injuries that occurred over a single year in these neighbourhoods, and a number of associated risk factors. We report on which residents were most at risk to being injured, the month, day and time of day when injuries took place, and the most common locations where these injuries occurred. The findings have implications for the develop-
ment of an injury prevention movement in the three participating sites, and more broadly in other similar peri-urban settings in South Africa.

Method

In 1998, a University based Institute initiated a household-based injury survey in three adjacent low-income neighbourhoods in the Western Cape. The survey constituted this Institute’s effort to establish replicable sentinel injury surveillance sites that could produce comprehensive injury baseline data utilizing community sources, which could then inform the development of appropriate community based safety interventions. The investigation is located within a theoretical framework comprising elements of the public health approach and community psychology. The public health and community psychology paradigms address physical and psychosocial health at the macro-societal level and draw upon the resources of multiple disciplines and sectors. The public health approach utilizes, amongst others, epidemiological strategies to investigate the incidence, extent, risks, and consequences to injury, and to then inform the implementation of primarily preventive environmental, engineering, educational and enforcement strategies (Butchart & Kruger, 2001). This approach is complemented by the community psychology focus on group organization; community resources, dynamics, and competencies; the mobilisation of individuals, groups, and communities; and the prevention and containment of psychological and social distress (Pretorius-Heuchert & Ahmed, 2001).

Site

The survey was conducted in a cluster of neighbourhoods located in the Helderberg municipality in the Western Cape, approximately 50 kilometres from the regional centre of Cape Town. As indicated, the neighbourhoods were targeted for their peri-urban location, their history of disadvantage and neglect, and their proximity to the participating research institution. As with many neighbourhoods located at the periphery of urban areas, residents reported high levels of poverty, unemployment, and crime. The majority of the residents in these neighbourhoods had settled there from the surrounding farming areas. These residents were formally allocated their properties and elementary services after the first democratic elections in South Africa, in 1994. At the time of information collection, the largest of the settlements consisted of informal shack dwellings and an estimated 8118 residents. The majority of these residents spoke primarily Xhosa. In the other two neighbouring settlements, the home language of the majority of residents was Afrikaans. One of these comprised a shack settlement of about 1125 people, and the other was a recent one-roomed housing development of 690 people. The latter population had previously been located in the surrounding shack
sites. An average of 4.5 residents lived in each household in these three neighbourhoods.

**Participants**

In this survey, a total of 449 household members were interviewed. The selection of the study respondents is detailed below, in the Sampling and Data Collection section. Most of the respondents, at 59.6% (n=266) were female, while 39.5% were male (n=176). The majority of respondents were aged between 30 and 39 years (37.9%; n=169), 20 and 29 years (29.4%; n=131) and 40 and 49 years (16.6%; n=74). About 47% (n=210) were employed at the time, with approximately 52.7% (n=235) unemployed. Approximately 39% (n=174) had an education below grade eight, while 49% (n=219) had a minimum grade eight education. These participants provided information on the injuries of all of the residents in their respective households.

Information was therefore gathered by proxy, on a total sample of 2011 residents from the 449 households (each with an estimated 4.5 occupants). The overall sample comprised 44.7% (n=940) male and 47.1% (n=995) female residents. Adults aged between 20 and 39 years comprised 39.7% (n=839) of the sample, while children and adolescents aged younger than 19 years constituted 36.9% (n=780) of the sample. Of the overall population aged 20 and older, 41.6% (n=554) were unemployed at the time of the interviews.

**Procedure**

The Institute sought to emphasize community participation in the design, development and implementation of the survey. The Institute made contact with representatives of the three neighbourhoods towards the end of 1997. Public meetings were held with these representatives and with different groups of residents in the communities, and focussed upon the socio-developmental needs of the neighbourhoods. The following concerns were prioritised: violence, lack of housing, crime, poverty, lack of health services, unemployment, and lack of educational opportunities and facilities. After identifying these concerns, the respective community leaders and the different groups of residents agreed to facilitate the development and implementation of a household survey, from which injury and violence prevention initiatives could be developed. Thereafter, a scientific advisory committee, which consisted of local government representatives, people with experience in community work, and researchers with a background in violence and injury surveillance, was formed to ensure that the overall study design was methodologically sound.

The advisory committee also examined the questionnaire utilized in this study. An earlier version of the questionnaire was first administered in six neighbourhoods in Johannesburg. The Johannesburg study also investigated injury incidence and risk (Butchart, Kruger, Lekoba and Lebese, 1998). The scien-
Scientific advisory committee supervised the finalisation of the current questionnaire, which recorded the demographics of all in the home and an injury profile for all in the household. Once the questionnaire was completed, it was translated from English into both Xhosa and Afrikaans, and then both versions were back translated into English. The translations were conducted by colleagues who were informed about the purpose of the study, and were considered competent in the appropriate languages. As a final check, a group of volunteers from the three neighbourhoods were employed to ensure that the Xhosa and Afrikaans translations were linguistically and 'culturally' appropriate. The final data collection was preceded by a trial administration of the questionnaire to a random sample of 10 houses. The questionnaire took approximately 75 minutes to administer.

**Sampling and Data Collection**

The household was identified as the unit for sampling. Maps of the neighbourhoods, depicting the plots allocated in each area were either secured from the municipality, or drawn up with the assistance of residents. These maps were then used to identify the number and location of households in these areas. In each of the three communities a sample of 20% of the households in each street was randomly selected. The 20% sample comprised a total of 449 households. The most senior adult in each household was invited to participate in the survey.

Thirty-two local residents, eight men and twenty-two women, were trained by the Institute to conduct the interviews. Institute staff hosted a four-day training workshop for all prospective interviewers. The workshop focussed on interview and translation skills. Thereafter, and over a two week period, interviews were conducted in the afternoons and after working hours by a team of two, where possible a female and male, for reasons of safety and support. Interviews were conducted in either Xhosa or Afrikaans.

**Data Analysis**

Descriptive data on physical injuries were coded according to WHO guidelines (WHO, 1998). A statistician processed data via the Stata computer package. Rates of injury are presented as percentages of the specified populations. In a number of cases, the analysis of the data was limited by the small sample size. Injury information was ratified via two processes. A 10% verification study was conducted in early 1999. Injury information sessions have also been implemented in the three neighbourhoods since 1999, and have provided further corroboration of the study data.
Results

This section details the household and injury profiles of the three neighbourhoods. Information is provided on a total of 96 injuries, which were reported as having occurred in the neighbourhoods across a one-year period. The data, in terms of manner or cause of injury, was incomplete in 17 cases (17.7%). Crude and specific estimates of injury are provided below. For the sake of brevity, ‘injury rate’ is used to refer to the percentage of residents reporting an injury in the study population per annum. Although not detected in this study, it is acknowledged that larger investigations may detect a significant percentage of injuries being sustained by the same individual, especially over longer periods of time, and thus alter the injury profile reported on below (Strydom, 1993).

Overall Injury Incidence

A total of 96 injuries, including those resulting in deaths, were reported in the three neighbourhoods for the year preceding the interviews. Comparisons of the injury data across the three neighbourhoods indicate similar injury rates but differing injury profiles (Van Niekerk, Bulbulia & Seedat, 2000). The Afrikaans shack settlement reported an injury rate of 7.5% (at a 95% confidence interval-95% ci: 4.6% to 11.9%), the Afrikaans one-roomed housing estate a rate of 2.9% (95% ci: 0.9% to 7.7%), and the Xhosa settlement, a rate of 4.6% (95% ci: 3.6% to 11.9%). Due to the small sample sizes the confidence intervals are wide, and the results were not significantly different.

The total of 96 injuries converts to a total injury rate for the population of 4.8% (95% ci: 3.9% to 5.8%). Of these injuries, 23% were due to transport crashes, 18% due to falls, 17% to violence, 7% due to burns, and 17% due to other injuries such as poisoning and sports injuries. The causes of nearly 18% of injuries could not be determined.

Table 1: Overview of Injury Data

<table>
<thead>
<tr>
<th>Item</th>
<th>Number</th>
<th>Annual Injury Rate (95% ci)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deaths</td>
<td>8</td>
<td>0.4% (0.2%-0.8%)</td>
</tr>
<tr>
<td>Total Injuries</td>
<td>96</td>
<td>4.8% (3.9%-5.8%)</td>
</tr>
<tr>
<td>Traffic Injuries</td>
<td>22</td>
<td>1.1% (7%-1.7%)</td>
</tr>
<tr>
<td>Falls</td>
<td>17</td>
<td>0.8% (0.5%-1.4%)</td>
</tr>
<tr>
<td>Violence</td>
<td>16</td>
<td>0.8% (0.5%-1.3%)</td>
</tr>
<tr>
<td>Burns</td>
<td>7</td>
<td>0.4% (0.2%-0.8%)</td>
</tr>
<tr>
<td>Injuries due to other causes (e.g. sport and poisoning)</td>
<td>16</td>
<td>0.8% (0.5%-1.3%)</td>
</tr>
<tr>
<td>Injuries of Unknown Cause</td>
<td>18</td>
<td>0.9% (0.5%-1.4%)</td>
</tr>
</tbody>
</table>

# 95% Confidence interval (ci) for rates and proportions. Rates are approximate per-
centages; the wide margins are mainly due to the sample size.

Deaths Due to Injury

Respondents reported a total of eight deaths due to injuries. This approximates to a total annual mortality rate due to injury of 0.4% of the population (95% ci: 0.2%-0.8%).

Traffic Injuries

Traffic incidents were the major overall cause of injury reported by respondents, accounting for 22 recorded injuries over a one-year period, at an injury rate of 1.1% (95% ci: 0.7%-1.7%). The majority (40.91%; n=9) of traffic injuries were sustained by vehicle passengers (27.27%; n=6) and drivers (13.63%; n=3). Nearly a third (31.82%; n=7) of traffic injuries were sustained by pedestrians.

Violent Injuries

A total of 16 violent injuries were reported by respondents. The total injury rate due to violence was 0.8% (95% ci: 0.5%-1.3%). The majority of violent injuries were sustained via assaults (50%; n=8), gang attacks (31.25%; 5), civil violence (12.5%; n=2), and attempted suicide (6.25%; n=1).

Falls, Burns and Other Causes

Falls resulted in 17 injuries at a rate of 0.8% (95% ci: 0.5%-1.4%) while 7 burn injuries were reported at a rate of 0.4% (95% ci: 0.2%-0.8%). A total of 16 injuries, at a rate of 0.8% (0.5%-1.3%) were reported to be the result of a variety of other causes, such as poisoning and sporting activities.

Characteristics of the Injured Residents

Age

Age specific injury rates were calculated as a proportion of the total number of persons in each of the age groups. The 30 to 39 year age group were most affected by injury (at an injury rate of 7.1%). The birth to 4-year group had the next highest rate of injuries (injury rate of 6.8%). The 40 to 49 group reported an injury rate of 6.1%, and the 50 to 59 year age group 6.1%. Approximately 4.4% of the 20 to 29 age group sustained injuries, 4.3% of the 5 to 9 year age group, and 3.8% of the 10 to 19 year group.

Within the 30 to 39 year age group, violence accounted for 28% (n=7) of injuries, and falls for 24% of injuries (n=6). In the birth to 4-year age range 38.5% of injuries (n=5) were due to falls. In the 20 to 29 year age group, 20% of injuries were respectively due to both traffic (n=4) and to violent causes (n=4). The major causes of injury specific to the different age groups are reported in Table 2.
Table 2: Age Group by Cause of Injury

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Traffic (%#)</th>
<th>Falls (%)</th>
<th>Violence (%)</th>
<th>Burns (%)</th>
<th>Others (%)</th>
<th>Unknown (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>1 (7.7)</td>
<td>5 (38.5)</td>
<td>2 (15.4)</td>
<td>1 (7.7)</td>
<td>1 (7.7)</td>
<td>3 (23.1)</td>
<td>13 (13.5)</td>
</tr>
<tr>
<td>5-9</td>
<td>2 (22.2)</td>
<td>1 (11.1)</td>
<td>1 (11.1)</td>
<td>1 (22.2)</td>
<td>2 (22.2)</td>
<td>9 (9.4)</td>
<td></td>
</tr>
<tr>
<td>10-19</td>
<td>2 (15.4)</td>
<td>1 (7.7)</td>
<td>-</td>
<td>1 (7.7)</td>
<td>2 (15.4)</td>
<td>7 (53.8)</td>
<td>13 (13.5)</td>
</tr>
<tr>
<td>20-29</td>
<td>4 (20)</td>
<td>2 (10)</td>
<td>4 (20)</td>
<td>1 (5)</td>
<td>3 (15)</td>
<td>6 (30)</td>
<td>9 (9.4)</td>
</tr>
<tr>
<td>30-39</td>
<td>4 (16)</td>
<td>6 (24)</td>
<td>7 (28)</td>
<td>1 (4)</td>
<td>5 (20)</td>
<td>2 (8)</td>
<td>25 (26)</td>
</tr>
<tr>
<td>40-49</td>
<td>1 (11.1)</td>
<td>1 (11.1)</td>
<td>2 (22.2)</td>
<td>1 (11.1)</td>
<td>3 (33.3)</td>
<td>1 (11.1)</td>
<td>9 (9.4)</td>
</tr>
<tr>
<td>50-59</td>
<td>1 (25)</td>
<td>1 (25)</td>
<td>-</td>
<td>1 (25)</td>
<td>-</td>
<td>1 (25)</td>
<td>4 (4.2)</td>
</tr>
<tr>
<td>Others</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3 (3.1)</td>
<td></td>
</tr>
</tbody>
</table>

# approximate percentages; - no data available

Gender

Over two thirds (69.79%, n=67) of the injured were male. For males, 26.9% (n=14) of injuries were caused by violent acts, 23.1% (n=12) by traffic incidents and 9.25% (n=10) by falls. For females, 34.8% (n=8) injuries were due to traffic injuries, and 13.5% (n=7) due to falls (see Table 3).

Table 3: Gender by Cause of Injury

<table>
<thead>
<tr>
<th>Gender</th>
<th>Traffic (%)</th>
<th>Falls (%)</th>
<th>Violence (%)</th>
<th>Burns (%)</th>
<th>Others (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>12 (23.1%)</td>
<td>10 (19.2%)</td>
<td>14 (26.9%)</td>
<td>3 (5.8%)</td>
<td>13 (25%)</td>
<td>52 (69.3)</td>
</tr>
<tr>
<td>Female</td>
<td>8 (34.8%)</td>
<td>7 (13.5%)</td>
<td>2 (3.8%)</td>
<td>3 (5.8%)</td>
<td>3 (5.8%)</td>
<td>23 (30.7)</td>
</tr>
</tbody>
</table>

High Risk Settings

Neighbourhood where the Injury Occurred

The majority of injuries, 52.08% (n=50) were reported to have occurred inside the particular neighbourhood where the injured resident lived. A large proportion of respondents (28.1%; n=27) could not recall where the injury had occurred.

Scene of Injury

Again, a large proportion of the respondents could not recall the specific setting where injuries had taken place (47.92%; n=46). For the rest, injuries occurred on the property or area immediately surrounding dwelling places (11.46%; n=11);
inside the home (7.29%; n=7); on the road or pavement (7.29%; n=7); and in nearby fields (7.29%; n=7).

**High Risk Time Periods**

**Time of Injury**
The time of the injury was available for 75% (n=72) of cases. Twenty-four percent (n=23) of all the reported injuries took place in the 12h00 to 16h00 time period; 21.87% (n=21) occurred between 16h00 and 20h00; 17.71% (n=17) between 8h00 and 12h00; and 7.29% (n=7) between 20h00 and 24h00 (see Figure 1).

**Figure 1: Time of Injury**

Day of injury data was available for 75% (n=24) of cases. Most injuries occurred on Saturdays (20.83%, n=20), Sundays (15.62%; n=15), Fridays (14.48%; n=14) and Thursdays (12.5%; n=12) (see Figure 2).
Month of injury data was available for 79% (n=76) of cases. Most injuries took place during April (17.71%; n=17), October (9.38%; n=9), June (8.33%; n=8) and December (7.29%; n=7) (see Figure 3).

Discussion

In this household-based study, 4.8% of residents reported injuries over a one-year period. This rate approximates to the annual injury rate of 5.2% reported by a hospital-based study of injuries in the peri-urban and rural areas in the Western
Cape (NTRP, 1994). By comparison, it was estimated in 1990 that 10% of Cape Metropole residents attended a medical service for fresh trauma (Van der Spuy, De Wet, Peden, Abrahams, Strydom & Van Schalkwyk, 1993). The current injury rate is also within the lower realms of the 3% to 15% range found in a methodologically similar household study of six low-income neighbourhoods in and around Johannesburg (Health Psychology Unit, HPU, 1999). Despite the accounts of high levels of environmental degradation, poverty, and unemployment, the three peri-urban settlements in this study reported lower rates of injury compared to other South African studies. Injuries may have been under-reported as a result of the utilisation of information from respondents (instead of the injured themselves), a lengthy recall period, possible uncertainty as to what constituted an “injury”, and the likely stigmatisation of certain types of injuries, such as those due to interpersonal violence or child sexual abuse. However, these rates may also be consistent with research that has indicated that historically disadvantaged communities do not necessarily capitulate under their oppressive conditions but can develop resources to cope with adversity (Ahmed, Seedat, van Niekerk & Bulbulia, 2001; Sonn & Fisher, 1998). The development of injury prevention interventions, in addition to requiring both injury and injury risk information, also need information on the social resources that may be available to a particular community (Ahmed et al., 2001).

**Causes of Injury**
The major causes of injury reported in the neighbourhoods were traffic collisions, followed by falls, and violence. As indicated in an earlier study, there may be significant differences between the three communities, although this was difficult to determine because of the small sample sizes (Van Niekerk, Bulbulia & Seedat, 2000). In comparison, the causal profile determined by the rural Western Cape hospital study (NTRP, 1994), and in the Cape Metropole (Van der Spuy et al., 1993) identified a preponderance of violent related non-fatal injuries (54.5% and 53.2% respectively), followed by “domestic” or household (mostly injuries due to falls, but also burns and bites) and traffic injuries. The two Johannesburg studies also reported on the prominence of violent and traffic injuries, followed by injuries due to falls, burns, or bites (HPU, 1999; Seedat, Swart & Lekoba, 2000). The latter studies also approximate recent indications of the national fatal injury profile (Burrows, Bowman, Matzopoulos & Van Niekerk, 2001). In the current study, the causes of 18% of injuries were not disclosed (possibly again because of the stigma attached to certain kinds of injuries), or could not be determined (due to inadequate completion of data or memory effects), and may as a result skew our understanding of what may be the dominant causes of injuries in the current sample.

In this study, and consistent with the emphases in the other investigations, more detailed data was gathered on violent and traffic injuries. An increased em-
phasis on the high incidence of injuries due to falls is required to complement this and recommended for further injury epidemiological work. In terms of traffic and violent injuries, the current investigation found that transport related injuries were most often sustained by pedestrians (31.8%), vehicle passengers (27.3%) and drivers (13.6%). The studies conducted in the rural Western Cape, the two in Johannesburg and the NIMSS reported a possibly greater prominence of pedestrian vulnerability (HPU, 1999; NTRP, 1994; Seedat, Swart & Lekoba, 2000). In this study, the most common form of violent injury was as a result of interpersonal assault (50% of violent injuries), followed by gang violence (31.3% of violent injuries), consistent with the Johannesburg and the rural Western Cape studies (HPU, 1999; NTRP, 1994; Seedat, Swart & Lekoba, 2000).

Risk Factors

In terms of those reported to be most at risk to being injured, the most vulnerable ages were those between 30 and 39, and birth to 4 years. The emphasis of injury occurring amongst the 30 to 39 year age group is broadly consistent with the findings of both the Johannesburg (HPU, 1999; Seedat, Swart & Lekoba, 2000) and rural Western Cape investigations (NTRP, 1994), but also echoes the national mortality data (Burrows et al., 2001). The 30 to 39 year age group reported a large proportion of injuries due to violence and falls, while the next significant risk group in terms of age, the birth to 4 year-olds, reported falls to be the major cause of injuries.

Over two thirds of injuries were sustained by males, consistent with both the South African morbidity and mortality research (Burrows et al., 2001; HPU, 1999; NTRF, 1994; Seedat et al., 2000; Van der Spuy et al., 1993). Males reported mostly violent (26.9%) and transport related injuries (23.1%), while over a third of injuries affecting women were transport related (34.8%). Only 3.8% of the injured women were reported to have sustained violent injuries. This may well be an under-report and would be consistent with the widespread stigma attached to especially sexualised violence. Other research has supported the concern that violence against women, especially physical and sexual abuse in the home, is greatly under-reported (Swart, Gilchrist, Butchart, Seedat & Martin, 2000).

High-risk sites for injury in the settlements were all uniformly directed within the neighbourhoods themselves. This would be consistent with the general degradation prevalent in settlements on the periphery of the wealthier and more resourced urban centres. Specifically dangerous sites within the neighbourhoods were reported to be the property or area immediately surrounding the dwelling places, the home itself, the road and adjacent pavements, and open fields. The identification of the home and its immediate surrounds as a high-risk site is reported in both the South African and international literature, and is a recommended site for community safety promotion interventions (Butchart & Peden,
In general, the neighbourhood hazards at the current three sites, but especially in the two informal settlements, are manifest in the lack of safe roads and clearly demarcated pavements for pedestrians, the poor lighting, inadequate or non-existent safe play areas for children, lack of electrification, and unsafe conditions within shacks.

In the current study, specific time periods were associated with a relatively high incidence of injury. These periods were reported to be in the afternoon, early evening, and to a lesser extent in the morning. The morning and afternoon periods may be explained by the increased presence of children alongside unsafe roads, fields, and in and around the often unsafe homes. The evening time period may be dangerous because of among other reasons, the increased travelling of residents from work, the very poor lighting in parts of these neighbourhoods, and the use of coal or paraffin stoves for cooking.

The weekends starting from Thursdays through to Sundays were also when most injuries occurred. This is consistent with the rest of the South African literature (Burrows et al., 2001; HPU, 1999; NTRF, 1994; Seedat et al., 2000). Again, some of the factors outlined above would be relevant here as well. The weekend period also sees an increase of recreational, entertainment and social activities. During the year, the months of April, October, June and December recorded most injuries. The escalation of injuries during these months may be partially explained by the presence of school vacations during these times, and again increased social and outdoor recreational activity.

Conclusions: A Platform for Injury Prevention

This household survey complements the growing body of injury research in South Africa. However, as indicated earlier, there is far less research information on the injury rates and hazards that are faced in the most impoverished and marginalized settings in the country. Without accurate, reliable and timely information on injury events and risk factors, the importance and design of interventions and prevention programmes are seriously compromised, and remain a challenge to those concerned with planning community safety promotion initiatives.

The current study highlights the importance of an information database from which to develop community specific injury prevention interventions. Although the injury rates of the three neighbourhoods were lower than that recorded in the more resourced metropolitan settings of Cape Town and Johannesburg, physical injury and trauma remains a substantial health threat in these three peri-urban locations. The injury profiles also emphasize the relative significance of those injuries due to traffic crashes, falls and violence, and that these be prioritised for intervention efforts. The concentration of injuries amongst males, on the road and in the home, amongst the working population and the very young, in the afternoons and evenings and over the weekends, provide information on the high
risk groups, locations, times and activities. This information is useful for direct­ing the scarce resources and personnel required for injury prevention and trauma control in South Africa. The WHO has proposed that a multi-faceted and holistic approach is required for injury reduction and prevention (WHO Department of Injury and Violence Prevention, 2002). This approach should incorporate combinations of five key strategies, including legislative strategies, such as committed traffic legislation enforcement; engineering strategies, such as community wide traffic calming measures, safe road construction and clear pavement demarcation; educational programmes, such as those identifying haz­ards in the home and on the road; environmental interventions, such as street lighting; and epidemiological or surveillance strategies, to monitor and provide the ongoing evidence for implementing or maintaining I

nterventions. Combinations of these interventions have demonstrated that the majority of physical injuries -such as those reported in this study – can be prevented (Barss et al., 1998; Butchart & Kruger, 2001).

Acknowledgements

The authors gratefully acknowledge the assistance of Rauf Sayed with the statistical analyses employed in this study.

References


