

# **SENTINEL SURVEILLANCE OF SUBSTANCE ABUSE AND TRAUMA AT GFJ**

**1999-2000**

**FINAL REPORT**



**September 2000**

**A DACST Innovation Fund Project**

## **Acknowledgements**

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## **1. INTRODUCTION**

According to Tim Ryan (1999), the international doors opened in South Africa in 1994, bringing with this many opportunities for growth and prosperity but also the 'ugly face' of the illegal drugs trade. Consequently, in 1997 we began monitoring the incidence and prevalence of both alcohol and illicit drugs among trauma patients in order to assess and identify emerging trends which will drive prevention programmes (Peden & Sidzumo, 1997).

In 1997, a pilot study was conducted at Groote Schuur Hospital (GSH) to monitor substance abuse among trauma patients. The results confirmed that alcohol was still the most commonly misused substance among trauma patients but that almost one-third of the patients had smoked cannabis prior to their injury. Other street drugs such as cocaine and opiates did not appear to appear to be a problem among Cape Town trauma patients but a high incidence of 'white pipe' smoking was found, almost exclusively among victims of violence (Peden, van der Spuy, Smith, et al., 2000).

After the pilot study in 1997, further trauma and drug studies were conducted at GSH and GF Jooste Hospital (GFJ) in Manenberg in 1999 with a view to conducting these studies annually. The results of the 1999 study indicated a drop in the alcohol-relatedness of injuries at GSH(Peden, Donson & Maziko, 1999) but exceptionally high levels of alcohol use and cannabis and mandrax abuse at GFJ ( ref the 1999 report).

This report presents data from the follow up study conducted at GFJ in 2000 and makes comparisons with the results obtained from the 1999 study. Annual studies such as these will provide trend data which will drive decision-making processes and assist with the development of prevention and training programmes. This study forms part of the National Violence and Injury Surveillance Initiative currently being undertaken by a consortium of research partners including the MRC, UNISA and the CSIR.

## **2. AIM OF THE STUDY**

The aim of the project was to monitor substance abuse and establish trends among trauma patients by:

- assessing the proportion of patients with fresh trauma who were alcohol positive at the time of their injury;
- assessing the proportion of patients with fresh trauma who had used an illicit drug prior to their injury; and
- assessing, by means of the CAGE questionnaire, what proportion of trauma patients were chronic alcoholics.

Two of the major objectives of this study were:

- to monitor substance abuse and trauma trends in a number of cities in South Africa, viz. Cape Town, Port Elizabeth, Umtata and Durban; and
- to include the results in the South African Community Epidemiology Network on Alcohol, Tobacco and Other Drug Use study (SACENDU) which monitors substance abuse trends (in general) at sentinel sites in South Africa.

## **3 METHODS**

### **3.1 Study Design**

The study is essentially an annual cross-sectional, descriptive study of the incidence of alcohol (and alcohol dependence) and illicit substance abuse among patients presenting with fresh trauma to the GFJ trauma unit.

### **3.2 Sampling**

#### **3.2.1 Study Population**

Patients who attended the GFJ Trauma Unit with fresh trauma.

### **3.2.2 Sampling Framework**

The concept of an 'ideal week' was used at the trauma unit. Each day was divided into four six-hour shifts and one shift was randomly selected per day, i.e. over four weeks the 24-hour period for each day was covered. All patients with fresh trauma attending during these times were included provided they gave written consent.

### **3.2.3 Inclusion/Exclusion Criteria**

The following inclusion and exclusion criteria applied to patients.

- Only patients with fresh physical trauma were included, i.e. reattenders were excluded.
- The injury-to-presentation time was set at a maximum of six hours.
- Referrals were included provided they did not obtain significant treatment at the first facility they attended and that their presentation to the study facility was within six hours.
- All patients had to give written, informed consent prior to inclusion in the study. Those patients who refused were excluded but the reason for their refusal was documented. For those less than 18 years of age, permission was requested from a parent or guardian.
- All types of poisoning and non-traumatic attempted suicide (e.g. drug overdoses) were excluded.

### **3.2.4 Sample Size**

A total of 115 patients were included in the study for the period 9 April to 6 May 2000.

## **3.3 Instrumentation**

- Each patient was interviewed by a field worker using a specially constructed interview sheet.
- Alcohol usage was assessed using self-report, a breath alcohol test and the CAGE questionnaire. Self-report was conducted by either asking the patient whether he/she had consumed alcohol prior to their injury or by using clinical judgement in unconscious or uncooperative patients. Breath alcohol was assessed using the Lion Alcolmeter SD2 - the use of which has previously been validated in a study in Cape Town (Peden, 1997). The CAGE questionnaire was included to assess chronic alcohol usage (Ewing,

1984).

- Self-report was also used to assess drug usage among patients. A urine specimen was also taken from the patient, a portion of which was used to screen for five drugs namely amphetamine, cannabis (THC), morphine, cocaine and methamphetamine, using a Multidrug kit (Peden, 2000). Formal chemical analysis (to test for dagga and methaqualone [Mandrax]) was conducted on the rest of the urine specimen by the Department of Pharmacology, UCT.

### **3.4 Field Workers**

The principal investigator (PI) was Margie Peden, Senior Specialist Scientist in Trauma Research at the Medical Research Council (MRC). She was assisted by a Chief and Senior Research Technologist from the MRC in Cape Town.

### **3.5 Ethics**

- Ethical approval for the study was obtained from the University of Cape Town (UCT) Ethics committee. Permission was also obtained from the Medical Superintendent of GFJ and the head of the Trauma Unit.
- The data was anonymous but linked to demographic/self report data. All data was kept in the strictest confidence by the primary researcher. No alcohol or drug results were documented in the patient's hospital folder. There was no way of cross-referencing research results to actual patient records.
- Informed, written consent was taken from the patients.

### **3.6 Analysis**

The data was checked and coded by the research team and cleaned before entering into Epi Info version 6.02 (Shareware, Center for Disease Control, 1994) by a dedicated data puncher. Epi Info was used to do the basic statistical analysis presented in this report.

## 4 RESULTS FOR GF JOOSTE HOSPITAL

### 4.1 An Overview

During 2000, a total of 198 patients were seen at GFJ Trauma Unit over the idealised week. 115 of these were included in the study.

Number of patients seen over an idealised week N = 198	
Included (n=115)	Excluded (n=83)
<b>Mean Age</b>	
29.5 ± 11.0 years	31.2 ± 15.8 years
<b>Gender</b>	
73.0% males	69.9% males
<b>Cause of Injury</b>	
Violence = 69.6% Traffic = 14.8% Non-traffic 'Accident' = 15.6%	Violence = 59.0% Traffic = 10.8% Non-traffic 'Accident' = 30.1%
<b>Reason for Exclusion</b>	
> 6 hours = 63.4% Repeat = 17.1% Transferred = 3.7% Minor = 7.3% Missed = 3.6%	

Two-thirds of the patients who attended the GFJ trauma unit were injured violently in 2000. This was the case for both the included and excluded categories. There was no significant difference in mean age for both categories ( $t=1.1$ ,  $p=0.29$ ). The main reasons for excluding patients were that their injury had occurred more than six hours prior to their hospital presentation or because they were reattending the facility for a follow-up of a previously treated injury.

## 4.2 Details of Injury

### 4.2.1 Overall cause of Injury

In 2000, violence out-numbered traffic as the leading cause of injury, accounting for nearly seventy percent of all injuries. 40% of the cases were due to both non-traffic 'accidents' (which included falls, burns, sports and other mishaps) and traffic collisions (Table I).

In comparison to the 1999 study, the 2000 study showed that:

- the proportion of patients injured violently had increased slightly and traffic collisions had dropped; and
- the proportion of patients with injuries due to non-traffic 'accidents' showed no significant difference.

**Table I : Overall Cause of Injury  
1999 versus 2000**

	<b>1999 n (%)</b>	<b>2000 n (%)</b>
Violence	80 (64.5)	80 (69.6)
Traffic	24 (19.4)	17 (14.8)
Non-traffic 'Accidents'	20 (16.1)	18 (15.7)

#### 4.2.1.1 Violence-related Injury

Of the 80 patients injured as a result of violence, 41% were due to sharp objects. Firearm-related assaults dropped between 1999 and 2000- (Chisq=4.1, p=0.04). Blunt (and blunt and sharp force combined) accounted for one-quarter of all violence-related incidents (Table II).

**Table II : Violence-related Injury 1999 versus 2000**

	1999 n (%)	2000 n (%)
Sharp Object	38 (47.5)	33 (41.3)
Firearm	20 (25.0)	10 (12.5)
Blunt & Sharp	8 (10.0)	12 (15.0)
Blunt object	8 (10.0)	8 (10.0)
Other	6 (7.5)	17(21.3)

#### 4.2.1.2 Traffic-related Injury

In 2000, nearly two-thirds of the traffic-related injuries involved pedestrians while one-third involved both passengers and drivers. Cars were involved in 82% of the collisions while train casualties accounted for twelve percent.

**Table III: Traffic-related Injury 1999 versus 2000**

	1999 n (%)	2000 n (%)
Driver	3 (12.5)	1 (5.9)
Passenger	10 (41.7)	5 (29.4)
Pedestrian	11 (45.8)	11 (64.7)

Table III shows that the proportion of pedestrian-related injuries increased by 19% over the year and that there was a concomitant reduction in passenger and driver-related injuries. There was no statistical significance( Chisq=1.43, p=0.23).

### 4.2.1.3 Non-traffic 'Accidents'

In 2000, falls accounted for nearly 45% of this category while a half of the cases were the result of mishaps with sharp objects (Table IV).

In comparison to the 1999 study, the 2000 study showed that:

- there was no significant difference in the proportion of fall-related injuries over the year; and
- the proportion of injuries due to sharp and other cases remained the same.

**Table IV: Non-traffic 'Accidents'  
1999 versus 2000**

	<b>1999 n (%)</b>	<b>2000 n (%)</b>
Fall	8 (40.0)	8 (44.4)
Sharp	10 (50.0)	9 (50.0)
Other	2 (10.0)	2 ( 11.1)

## 4.2.2 Demographics

### 4.2.2.1 Age

The mean age for patients seen during both 1999 and 2000 was similar ( $t=1.5$ ,  $p=0.12$ ). The largest proportion of injuries was seen in the 25-34 year age range. These injuries were mainly due to violence. Over the year there was a decrease in traffic-related injuries in the 45 to 54 year age group (Table V).

**Table V : Cause of Injury by Age**

	Violence		Traffic		Non-traffic 'accidents'		Total	
	1999	2000	1999	2000	1999	2000	1999	2000
13 - 24	24 (70.6)	33 (80.5)	5 (14.7)	3 (7.3)	5 (14.7)	5 (12.2)	34	41
25 - 34	31 (72.0)	29 (64.4)	6 (14.0)	10 (22.2)	6 (14.0)	6 (13.3)	43	45
35 - 44	18 (60.0)	14 (70.0)	8 (26.7)	3 (15.0)	4 (13.3)	3 (15.0)	30	20
45 - 54	5 (38.5)	4 (80.0)	5 (38.5)	0 ( 0.0)	3 (23.0)	1 (20.0)	13	5
55+	2 (50.0)	0 ( 0.0)	0 ( 0.0)	1 (25.0)	2 (50.0)	3 (75.0)	4	4
Mean Age (±SD)	30.6 (10.5)	27.4 (8.3)	32.9 (17.3)	32.5 (12.2)	34.4 (10.3)	35.6 (16.9)	29.5 (11.0)	31.7 (11.8)

#### 4.2.2.2 Gender

Of the cases studied at the GFJ trauma unit over the study period, three-quarters were male and one-quarter were female. There were no statistically significant differences in gender during the two study periods (Chisq=0.04, p=0.84).

**Table VI : Cause of Injury by Gender**

	Violence		Traffic		Non-traffic 'accidents'		Total	
	1999	2000	1999	2000	1999	2000	1999	2000
Female	18 (56.3)	20 (64.5)	8 (25.0)	5 (16.1)	6 (18.8)	6 (19.4)	32	31
Male	62 (67.4)	60 (71.4)	16 (17.4)	12 (14.3)	14 (15.2)	12 (14.3)	92	84

In comparison to the 1999 study, the 2000 study did show that the proportion of patients with traffic-related injuries had dropped and that the proportion of violence-related injuries had increased in both genders while non-traffic 'accidents' remained the same (Table VI).

## 4.2.3 When and Where Injuries Occurred

### 4.2.3.1 Time of Injury

The proportion of injuries that occurred during office hours (from 08h00-16h59) and after hours (from 17h00 - 07h59) was similar over the study period (Figure 1).

In both 1999 and 2000 there were distinct peaks between 16h00 and 19h59.

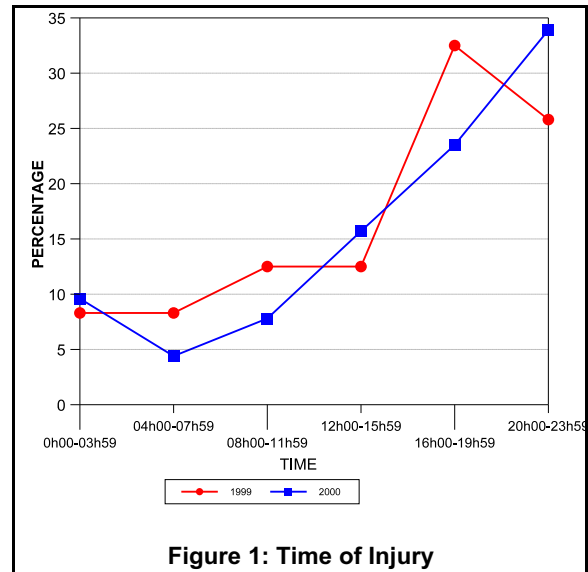


Figure 1: Time of Injury

### 4.3.4.2 Day of Injury

As expected, nearly 70% of the patients presenting to the GFJ trauma unit had sustained their injury over the weekend, i.e. from Friday evening until Monday morning. This phenomenon was similar for both study years (  $\text{Chisq}=9.7$ ,  $p=0.14$ ) (Figure 2).

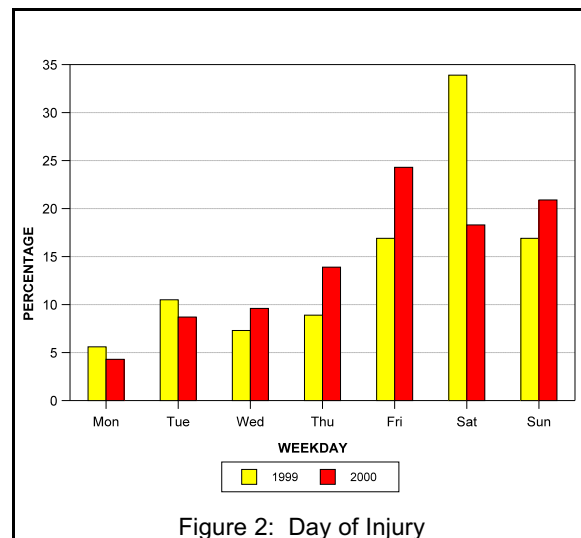


Figure 2: Day of Injury

### 4.2.3.3 Suburb of Injury

Over the two study periods, more than 60% of patients were injured in the four suburbs indicated in Table VII. Injuries that occurred in the four suburbs were mainly due to violence.

Comparison between the study conducted in 1999 and this one shows that:

- violence-related injuries in Gugulethu dropped by 14%;
- violence-related injuries increased by 14% in Khayelitsha;
- no patients with traffic-related injuries were admitted from the Athlone area over both study periods and
- violence-related injuries in Manenberg remained the same but increased in Mitchell's Plain by 12%.

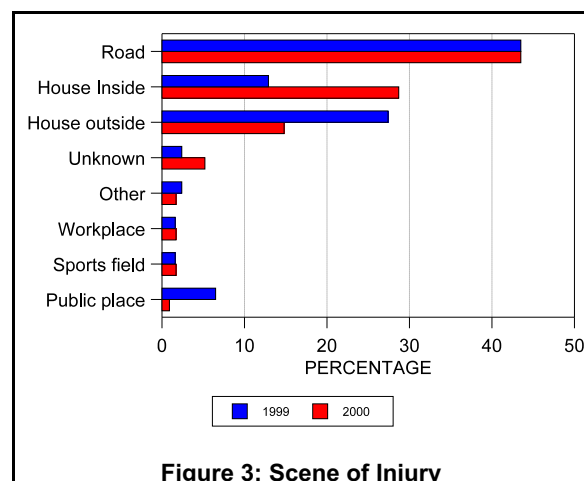
**Table VII : Top Four Suburbs by Cause of Injury**

	Violence		Traffic		Non-traffic 'Accidents'		Total	
	1999	2000	1999	2000	1999	2000	1999	2000
Gugulethu	20 (87.0)	11 (73.3)	2 (8.7)	2 (13.3)	1 (4.3)	2 (13.3)	23	15
Manenberg	26 (63.4)	27 (62.8)	4 (9.8)	6 (13.9)	11(26.8)	10 (23.3)	41	43
Khayelitsha	11 (73.3)	14 (87.5)	2 (13.3)	2 (12.5)	2 (13.3)	0 ( 0.0)	15	16
Mitchells Plain	18 (51.4)	17 (62.9)	12(34.3)	6 (22.2)	5 (14.3)	4 (14.8)	35	27

The cells show the number of injuries followed by the percentages (in brackets) by suburb and cause of injury

### 4.2.3.4 Scene of Injury

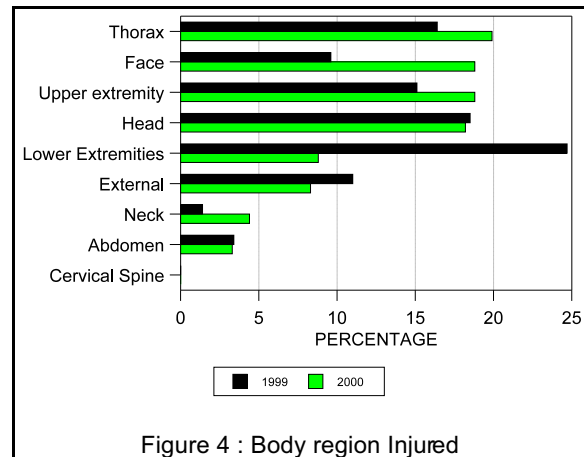
Over the two study periods, nearly 45% of all patients were injured on the road while 42% of incidences occurred in and around the home (Figure 3).



## 4.2.4 Location and Severity of Injury

### 4.2.4.1 Body Region Injured

Over the two study periods an increase in the proportion of injuries to the thorax, face, upper extremities and head was noted while there was a concomitant decrease in injuries to the lower extremities as well as external injuries such as burns (Figure 4). There were no patients with cervical injuries admitted to the GFJ trauma unit during either the 1999 or 2000 sampling periods.

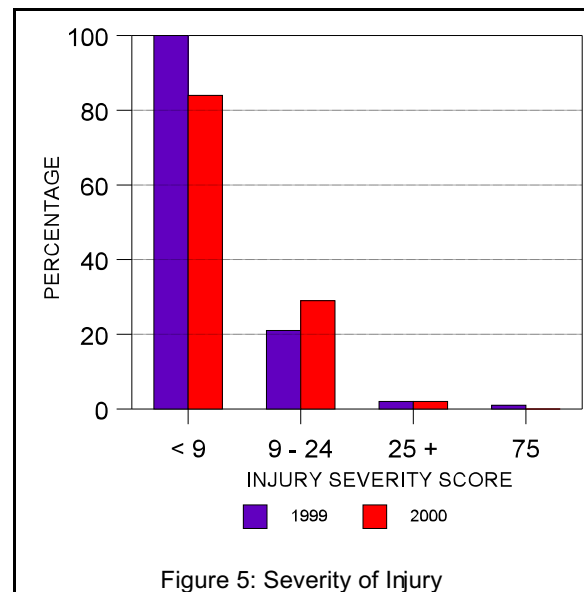


### 4.2.4.2 Injury Severity

83% of the patients sustained minor injuries (ISS < 9) while just over 17% had ISS ratings of nine or more.

By comparison with the study conducted in 1999, the 2000 study showed that:

- the proportion of patients with mild injuries had dropped by 8%;
- the proportion of patients with moderate injuries increased by approximately 8%;
- the proportion of patients with severe injuries remained the same.



The median ISS for injuries sustained in both 1999 and 2000 was 1.

No deaths were recorded during the 2000 sampling period.

## 4.2.5 Care and Placement of Patients

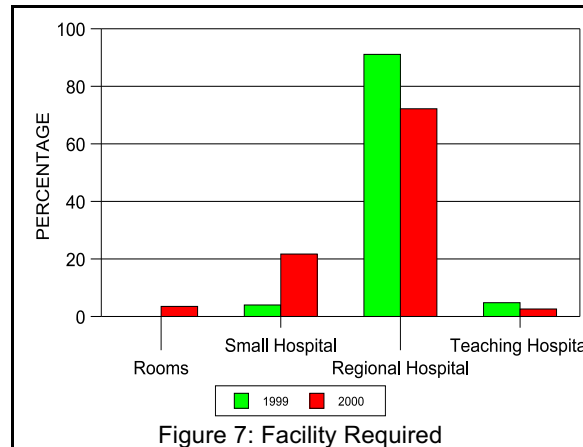
### 4.2.5.1 Level of Care Required

Although the majority of patients sustained minor injuries, the research team judged that less than one percent could have been adequately managed by a nursing sister. Patients requiring the service of a medical officer remained the same while two percent more needed the services of a specialist doctor in 2000 (Figure 6).



### 4.2.5.2 Facility Required

In 2000, the research team judged that nine out of ten patients attended GF Jooste appropriately but that a small percentage needed to be treated elsewhere (Figure 7).



### 4.2.5.3 Placement after Initial Assessment and Care

Over the two study periods three-quarters of the patients who were seen in the trauma unit were treated and discharged. There was no statistically significant difference in the number of patients required admission to hospital between 2000 (Chisq=0.9, p=0.02) (Table VIII).

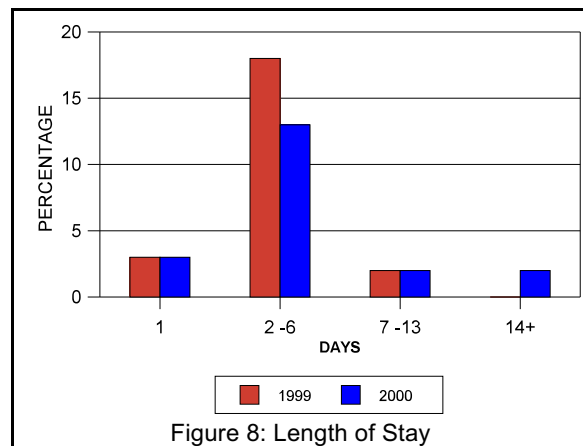
**Table VIII: Placement after Initial Assessment and Placement 1999 versus 2000**

	1999 n (%)	2000 n (%)
Discharged	90 (72.6)	87 (75.7)
Admit : Ward	23 (18.6)	23 (20.0)
ICU	1 ( 0.8)	0 ( 0.0)
Died	3 ( 2.4)	0 ( 0.0)
Transferred	3 (2.4)	5 (4.3)

### 4.2.5.4 Length of Stay

Four percent more patients were discharged after 24 hours while an additional 20% stayed for up to one week or more during 2000 (Figure 8).

In 1999 patients admitted required an average stay of 2 days (IQR 2 - 3 days) in hospital while in 2000 their average length of stay was 3.5 days (IQR 2 - 6 days). There was no statistically significant difference.



## 4.2.6 Estimated Disability of Patients

Estimated disability was assessed by the research team by judging what the impact of the injury would have on the patient's quality of life.

### 4.2.6.1 Severity of Disability

In 2000, nearly two-thirds of patients were judged to have a mild disability while 30% of them had more severe disabilities (Table IX).

The difference in the number of deaths between the two study periods was not statistically significant (Fishers Exact = 6.05,  $p=0.42$ ).

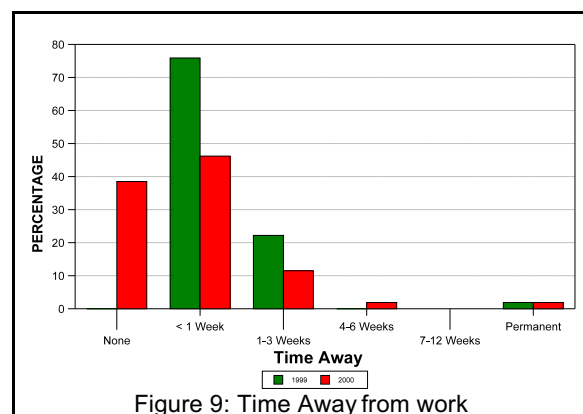
**Table IX: Severity of Disability**  
1999 versus 2000

	1999 n (%)	2000 n (%)
None	0 ( 0.0)	8 ( 7.0)
Mild	98 (79.0)	72 (62.8)
Moderate	20 (16.1)	33 (28.7)
Serious	3 ( 2.4)	2 ( 1.7)
Total	0 ( 0.0)	0 ( 0.0)
Dead	3 ( 2.4)	0 (0.0)

### 4.2.6.2 Time Away from Work

In 2000, 45% of patients were employed while 36% were unemployed.

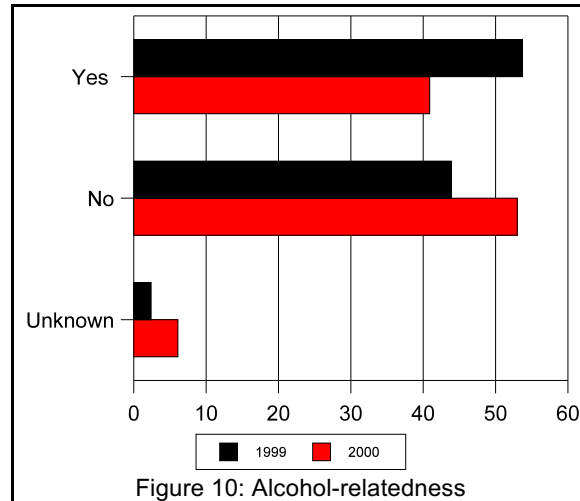
Of those employed, nearly 60% required at least a week off work (compared with 76% in 1999). Less than 1% of patients required up to 4 weeks off work compared with 22% of patients in 1999 (Figure 9). These differences were not statistically significant.



### 4.3 Alcohol Usage

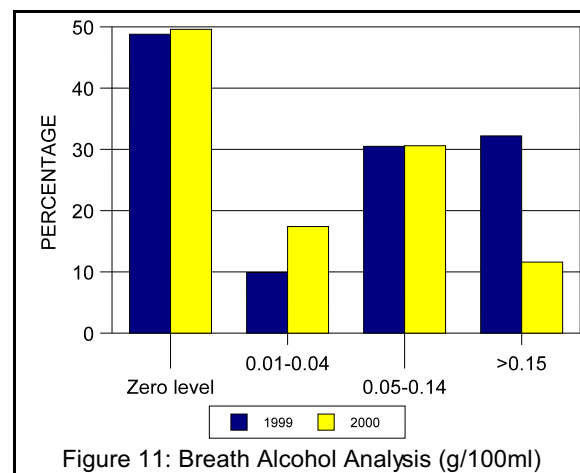
#### 4.3.1 Alcohol-relatedness

This parameter was assessed by either asking the patient whether he/she had used alcohol prior to their injury or by using clinical judgement in unconscious or uncooperative patients. In 2000, 13% less patients said that they had used alcohol prior to their injury (Figure 10). These differences were not statistically significant.



#### 4.3.2 Breath Alcohol Analysis

A similar proportion of patients were found to be breath alcohol positive (BrAc) in both 1999 and 2000 (Figure 11). However, the mean BrAC for those with positive alcohol levels in 2000 ( $0.07 \pm 0.05$  g/100ml) was significantly lower than that of  $0.1 \pm 0.06$ g/100ml recorded in 1999 ( $t=3.13, p=0.002$ ).



Nearly 60% of the patients that were injured violently had positive alcohol levels. Patients who were injured due to violence and non-traffic 'accidents' had mean BrAC levels of approximately 0.07 g/100ml while those injured due to traffic collisions had slightly lower levels (Table X).

**Table X: Non-zero Breath Alcohol Levels 2000**

	Positives	%	Mean BrAC (g/100ml)	± Std Dev
Violence	47	58.8	0.07	0.05
Traffic	6	35.3	0.03	0.05
Non-traffic 'Accidents'	6	16.7	0.07	0.05

In comparison with the study conducted in 1999, the 2000 study showed that:

- the proportion of patients who were injured violently and had positive BrAC levels

- decreased by 6%; and
- the proportion of BrAC positive patients injured in motor vehicle collisions remained the same.

### 4.3.3 Chronic Alcohol Usage

In 2000, 7% of the patients could not be interviewed because of the severity of their injuries or because they were too intoxicated to answer the four CAGE questions.

Of the remaining 107 patients who could be interviewed, 67.3% had a total CAGE score of zero compared to 55.2% in 1999 (Figure 12). A staggering 32% of patients had a total CAGE score of two or more indicating problem drinking or possible alcohol dependence.

However, this result, although problematic, was significantly lower than the 38.8% recorded in 1999 (Chisq=1.22, p=0.27).

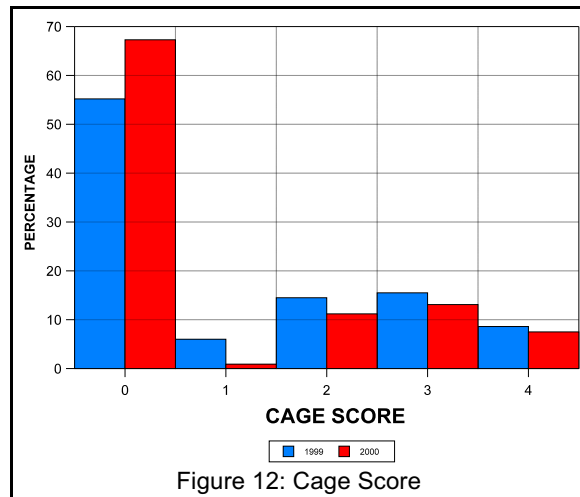


Figure 12: Cage Score

### 4.3.4 Alcohol Trends

Between 1999 and 2000 study period, the proportion of BrAC positive patients remained the same (Figure 13).

Problem drinking decreased by 7% between 1999 and 2000. This trend should be monitored in 2001.

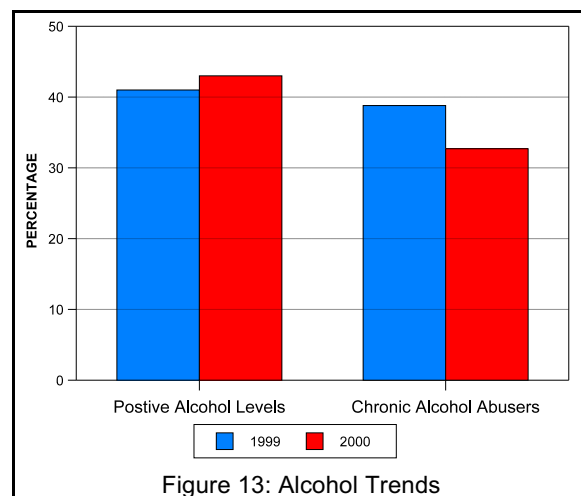


Figure 13: Alcohol Trends

## 4.4 Illicit Drug Usage

Drug usage was assessed by means of self-report, the Multidrug kit and conventional pharmacological methods.

### 4.4.1 Self-reported Drug Usage

About one in ten patients acknowledged using illicit drugs prior to their injury over the two study periods (Figure 14).

### 4.4.2 Multidrug Screen Results

Drug screen results were obtained in 95 patients in 2000. The Multidrug kit screen for five drugs using a sample of urine. In 1999, 37.8% of patients were positive for at least one drug (some were positive for a combination of drugs). In 2000, 27.8% of patients were positive for at least one drug. This decrease, although clinically significant, was not statistically significant. As can be seen by Table XI the bulk of the decrease in drug usage can be attributed to a reduction in dagga smoking (Chisq=2.7, p=0.01).

**Table XI: Multidrug Screen Results**  
1999 versus 2000

	1999 n (%)	2000 n (%)
Amphetamine	0 ( 0.0)	2 ( 2.1)
THC	40 (36.4)	26 (27.4)
Morphine	9 (8.2)	13 (13.7)
Cocaine	1 (0.9)	2 ( 2.1)
Methamphetamine	0 ( 0.0)	1 ( 1.1)

### 4.4.3 Pharmacological Analysis

Conventional wet analysis was undertaken on a sample of urine. As can be seen from Table XII, this analysis revealed that one-third of patients had used dagga (relatively stable between the two studies) but that there was a significant increase in the number of Mandrax smokers (Chisq = 3.2, p=0.08).

**Table XII: Pharmacological Analysis  
1999 versus 2000**

	Positive Result	
	1999 n (%)	2000 n (%)
Dagga	38 (34.5)	34 (35.8)
Mandrax	21 (19.1)	28 (29.5)
White Pipe	21 (16.9)	25 (21.7)

In 2000, twenty-one of the 95 patients (21.7%) had smoked a 'white pipe' prior to their injury compared with 17% in 1999. This difference was not statistically significant (Chisq=0.89, p=0.34)

### 4.4.4 Multidrug Screen Kit versus Pharmacological Analysis

The Multidrug screening kit was found to be valid and accurate.

Comparing the kit to the pharmacological 'gold standard' produced a sensitivity of 100% (in 1999) and 64.7% (in 2000) and a specificity of 97% (in 1999) and 93.4% (in 2000) as can be seen in Figure 15. It is not fully understood why the sensitivity dropped so much in 2000 and this will be monitored in 2001 and in drug studies used in other facilities. It could be

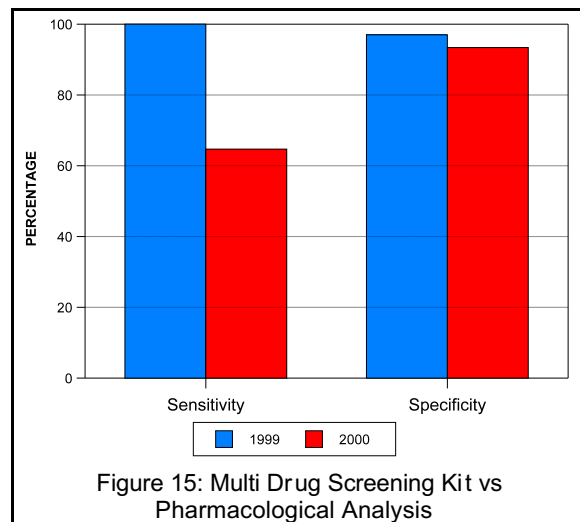


Figure 15: Multi Drug Screening Kit vs Pharmacological Analysis

related to batch of the Multidrug kits since the same field workers were used in 1999 and 2000. Despite this problem, we still consider this kit to be reliable enough to assess cannabis in the urine of injured patients.

#### 14.4.5 Drug Trends

There has been little actual increase in the prevalence of drug usage between 1999 and 2000. There are, however, slightly more cocaine and more mandrax and less dagga users but this could reflect market trends and availability.

### 5. SUMMARY

The following summarises the trend data obtained by the Trauma and Drug Study in 1999 and 2000:

- patients were predominantly young males
- most injuries were due to violence
- most patients who were injured violently abused alcohol and/or drugs prior to their injury
- sharp objects and firearms were still a major cause of violence
- there was an decrease in the proportion of firearm violence
- most of the patients who were involved in traffic collisions were pedestrians
- injuries most commonly occur after hours and on weekends
- there was an increase in the frequency of injuries to the upper extremities, face, thorax and head
- there was a decrease in the frequency of injuries to the external and lower extremities
- more than half of the patients seen at GFJ trauma unit could have been treated at a clinic facility
- patients required fewer days in hospital in 2000 than in 1999
- most patients sustained injuries which were relatively minor and few were left with long-term disabilities
- approximately 60% of patients seen at GFJ trauma unit are intoxicated with alcohol at the time of their presentation
- patients seen in 2000 had significantly lower alcohol levels than in 1999
- significantly less patients could be classified as chronic alcoholics in 2000
- there was an actual decrease in the number of dagga smokers in 2000
- there was an increase in mandrax users in 2000.

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