

# Alcohol use and trauma in Cape Town, Durban and Port Elizabeth, South Africa: 1999–2001

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## Abstract

*Objective.* To assess acute alcohol intoxication among patients presenting with recent injuries at trauma units in Cape Town, Port Elizabeth and Durban from 1999 to 2001.

*Design.* Cross-sectional surveys were conducted during a four-week period in each of the above sites in 1999, 2000 and 2001. The concept of an 'idealised week' was used to render representative samples. Breath-alcohol concentrations were assessed in a total of 1900 patients using a Lion SD2 alcolmeter.

*Results.* Over half of all the patients experienced violent injuries. Across sites and for each respective year of the survey, between 35.8% and 78.9% of patients tested positive for alcohol. Between 16.5% and 67.0% had a breath-alcohol concentration greater than or equal to 0.05 g/100 ml. Port Elizabeth consistently had the highest proportion of patients testing positive for alcohol. Patients injured as a result of violence were more likely to test positive for alcohol than patient who sustained road traffic or other unintentional injuries.

*Conclusions.* Alcohol involvement among trauma patients remained consistently high for each of the three study periods. Efforts to combat the abuse of alcohol would appear to paramount in reducing the burden of injuries on health care services.

**Keywords:** Alcohol; trauma; injury; South Africa.

## Introduction

In South Africa, injury accounts for 25% of male and 10% of female deaths. For males, this surpasses the proportion of deaths attributed to cardiovascular disease (17%) and infec-

tious or parasitic disease (13%).<sup>1</sup> However, it is non-fatal injuries or injuries that are not immediately fatal that are likely to place an even greater burden on the health sector, particularly ambulance and trauma services. The focus on injuries requires an examination of contributory factors such as alcohol abuse, gun ownership and poverty.<sup>2</sup>

Internationally, the link between alcohol use/abuse and fatal or non-fatal injury in particular has been well established.<sup>3,4</sup> In the present study, the extent of alcohol use by patients with recent physical trauma was investigated annually in three South African cities from 1999 to 2001 in order to increase awareness of the role of alcohol in various forms of injury and to inform local intervention efforts.

## Methods

Patients presenting with recent injuries (established via self-report to be less than 6 hours old) at selected state trauma units in Cape Town, Port Elizabeth and Durban were included in each of three surveys conducted annually from 1999–2001. The five selected hospitals are all major state hospitals in these cities. The concept of an 'idealized week' was used for sampling purposes because of the uneven spread of patients attending these facilities throughout the week. Each day was divided into four 6-hour shifts. One shift was randomly selected per day so that in each of the 4-week study periods conducted annually at each site, a complete 24-hour period would be covered for each day. All patients attending the trauma unit during these times were included provided that they gave written consent. Poisonings, non-traumatic attempted suicides and paediatric patients were excluded from the study, as well as patients who were too

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severely injured to be interviewed. Patients who had been referred by other treatment facilities were included if they did not receive significant treatment at the first facility they attended. Very few of the patients approached refused to participate in the study.

A total of 1,900 patients were included across the three sites and the 3 years. Socio-demographical data were recorded as well as the cause and type of injuries sustained. Acute alcohol intoxication was assessed by means of self-report and breath-alcohol concentration analysis using a Lion SD2 alcoholmeter that had been validated in a similar cohort.

## Results

### Demographics of the sample

Consistently across the three cities and in each year of the survey, over two-thirds of the subjects were male. The mean age across sites and time periods ranged between 30 years and 34 years. Between half and two-thirds of the injuries sustained across the three cities and for each year of the survey were as a result of violence. Road traffic and other unintentional injuries (e.g. falls, burns, near drowning, etc.) constituted the remainder of the injuries.

### Breath-alcohol assessment

The highest proportions of patients testing positive for alcohol were consistently found in Port Elizabeth. In this city,

over the 3 years of the survey, between 60.4% and 78.9% of patients who were screened for alcohol use tested positive, declining from a high of 78.9% in 1999 (Table 1). The Cochran-Armitage Trend test yielded a significant downward trend over time ( $Z = -4.45$ ,  $p < 0.01$ ). In Cape Town, between 44.6% and 54.9% of patients tested positive for alcohol, with the peak occurring in 2001, showing a significant upward trend ( $Z = 2.15$ ,  $p < 0.05$ ). In Durban, a significant steady decline in the proportion of patients who tested positive for alcohol was noted, from 46.4% in 1999 to 35.8% in 2001 ( $Z = -2.08$ ,  $p < 0.05$ ).

Patients injured as a result of violence were consistently most likely to test positive for alcohol in all sites (Cape Town:  $\chi^2 = 50.87$ ,  $p < 0.01$ ; Port Elizabeth:  $\chi^2 = 82.18$ ,  $p < 0.01$ ; Durban:  $\chi^2 = 38.28$ ,  $p < 0.01$ ) (Table 2). Although the proportion of patients who sustained a transport-related injury who tested positive for alcohol was lower than for violence-related injuries, in Cape Town and Port Elizabeth at least a third tested positive. The proportion of patients who were injured in transport-related incidents who tested positive for alcohol decreased significantly, according to the Cochran-Armitage Trend test, in Durban and Port Elizabeth (Table 2) (Port Elizabeth:  $Z = -3.09$ ,  $p < 0.01$ ; Durban:  $Z = -2.57$ ,  $p < 0.05$ ).

Among cases injured in transport-related incidents, injured pedestrians were most likely to test positive for alcohol in Cape Town ( $\chi^2 = 17.74$ ,  $p < 0.01$ ) and Port Elizabeth ( $\chi^2 = 13.62$ ,  $p < 0.01$ ). In Cape Town, 56.5% of all

Table 1. Breath-alcohol concentration results

	Cape Town						Port Elizabeth						Durban					
	1999		2000		2001		1999		2000		2001		1999		2000		2001	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
<b>Breath-alcohol</b>																		
Positive	103	44.6	122	52.8	100	54.9	213	78.9	148	63.8	125	60.4	90	46.4	74	40.3	64	35.8
$\geq 0.05$ g/100 ml*	80	34.6	88	38.1	65	35.7	181	67.0	129	55.6	118	57.0	32	16.5	40	23.0	40	22.3
Mean + BrAC	0.11		0.07		0.09		0.12		0.14		0.10		0.06		0.07		0.08	
(SD)	(0.09)		(0.04)		(0.07)		(0.06)		(0.07)		(0.04)		(0.09)		(0.07)		(0.07)	

BrAC = breath-alcohol concentration.

\*Proportion of total sample

Table 2. Percent positive for alcohol by type of injury

Injury type	Cape Town			Port Elizabeth			Durban		
	1999	2000	2001	1999	2000	2001	1999	2000	2001
Violent	58.4	64.9	61.2	89.8	72.5	73.4	58.0	56.3	43.0
Transport	32.7	42.5	46.2	73.0	58.1	41.2	41.0	19.6	15.8
Other	14.3	31.6	40.7	43.9	39.6	26.5	29.1	30.6	20.6

injured pedestrians tested positive for alcohol compared to 27.8% of injured drivers and 18.2% of injured passengers. In Port Elizabeth, 82.5% of injured pedestrians tested positive compared to 51.6% of injured drivers and 46.8% of injured passengers.

## Discussion

The high proportions of trauma patients testing positive for alcohol are cause for grave concern. Across the 3 sites over the 3 years of the survey, at least a third of the patients tested positive for alcohol. Studies in other low- and middle-income countries have not found such high proportions of trauma patients testing positive for alcohol. For example, a study conducted in Sao Paulo, Brazil, in 1998/1999, found that 28.9% of patients tested at a 'level 1' trauma centre tested positive for alcohol,<sup>5</sup> and a study conducted among victims of motor vehicle crashes in Kenya in 1998 found that 23.4% tested positive for alcohol.<sup>6</sup>

Efforts to combat the abuse and misuse of alcohol would appear to be paramount in reducing the burden of non-fatal injuries on health care services in South Africa. Campaigns to reduce alcohol-related motor vehicle crashes need to be reinforced and particular attention is needed to reduce injuries among intoxicated pedestrians. Some consideration should also be given to referring severely intoxicated trauma patients to substance abuse treatment. Although no causal relationship was investigated in this study, research is urgently required to investigate the extent to which alcohol is the triggering cause of violent injuries, and the associated risk factors.

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