

# Project Report

## “Driving under the influence of alcohol and road traffic injuries in Bangalore”

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### In collaboration with



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## **2. EXECUTIVE SUMMARY**

*Global research in the last three decades on road safety promotion has opened new vistas to develop and implement programmes on a scientific basis. Consequently, many developed countries have used research data to give directions for road safety policies and programmes. Undoubtedly, this has resulted in a reduction of deaths and injuries while building safer road environments across the world.*

*With nearly 700 deaths and 7000 injuries (as per official reports) on Bangalore roads, road safety does not have any systematic directions. With a new mission and commitment, “SURAKSHA SANCHAR (Safer Travel)” was launched in Bangalore during 1999 with the active participation of Bangalore Agenda Task Force, Bangalore City Police, National Institute of Mental Health And Neuro Sciences, Global Road Safety Programme, Non -Governmental Organizations and Citizens of Bangalore. “Reduction of drinking and driving” is the first major programme under this project with additional inputs from International Centre for Alcohol Policy and Society for Alcohol Related Social Policy Initiatives.*

*The present study led by NIMHANS, aimed at identifying alcohol related road traffic injuries in 12 major hospitals of Bangalore city. Road safety behaviours and dimensions of drinking were established through road side surveys in 34 checkpoints. Trained research teams from NIMHANS undertook data collection activities in both components of the survey over a period of 30 days.*

*The hospital surveys revealed that nearly 28% of traffic injuries were directly attributable to alcohol. Young men - semi-literate - drinking spirits [“hard liquor”] in excessive amount in bars - alone or partying - getting on a two wheeler – still confident to drive – sustaining injuries in a skid or head on collision - having fractures or brain damage emerged as the profile of those drinking – driving – getting injured.*

*The road side survey revealed that the extent of drivers under the influence of alcohol varied from 11% as detected by the older methodology of police testing drivers selectively on suspicion to 40% as detected by the newer methodology of random checking, from 2 phases of the study. Among*

*those tested positive, 35% were above the legally permissible limits of 30 mg / 100 ml when checked on breath analyzer. Here again, it was the young male (25-39 years) – literate – with heavy drinking in bars or at parties – either alone or with friends – knowledgeable about hazards of drinking but ignorant of dangers or legal consequences, who were posing greater dangers on the road. Bus and matador drivers contributing for nearly one fourth of those tested positive were the other high risk groups on the road as they carry large number of passengers in their vehicles*

*The second phase of the project will utilize the information generated from these surveys to inform public about health, social, enforcement and legal aspects of drinking through media and focused work over the next few months. This would be followed by strong enforcement to reinforce the commitment of Bangalore city Police to reduce the problem. Hospital and road side surveys would follow to check the efficacy and effectiveness of the programme.*

*While this first demonstration project in Bangalore would pave the way for long-term measures, concerted and continuous action by police – government – health – media professionals are urgently required to tackle the problem. The development of a properly trained enforcement team, visible and uniform enforcement of programmes, stiff penalties, clear communication of legal issues to society, enforcing timings of beverage alcohol availability at bars and pubs, training of bartenders and retail outlet owners are urgently required to make citizens' lives safer on roads. Undoubtedly, political willingness, increasing public awareness, greater involvement of professionals and a commitment by one and all to make roads safer, form the pillars of this programme.*

### 3. INTRODUCTION:

The city of Bangalore has been progressing at a significant pace during the last one to two decades. The city has witnessed increasing motorization, urbanization, migration and changing values of people. The rapid change in the life style of people has been a noticeable phenomenon in all urban areas of India, more so in the city of Bangalore. The city has nearly 16,00,000 registered vehicles and another 2,00,000 enter the city every day from outside.

An accompanying effect of these changes has been an increase in road accidents in the city of Bangalore. As per official reports, nearly 700 people are killed and 7000 injured every year on the roads of Bangalore <sup>(1)</sup>. However, a recently completed study by NIMHANS estimates that nearly 800 deaths and 14000 persons are injured every year. This could be related to variations in data collection practices in different agencies <sup>(2)</sup>.

It is known that road accidents are multi-factorial in nature. The various factors related to human, vehicle, environmental and system related issues contribute to increasing road accidents. Among the various human factors, consumption of alcohol and subsequent driving on the roads has been found to be a major risk factor. The relationship of alcohol with injuries in general and road accidents in particular have been documented by numerous reports. It is known that alcohol increases the probability of injury occurrence and recovery in a number of ways. Researchers have put a number of hypotheses forward. Alcohol is a substance which depresses brain activity and causes progressive disinhibition and loss of ability to control physical and cognitive tasks. Increasing risk taking behaviour due to increased disinhibition, impairment of psychomotor performance and delayed reaction time in the crisis situation, poor judgment in estimating distance or the ability in maneuvering of vehicles, increase the chances of having an accident. Alcohol intoxication also reduces the individuals' ability to take evasive action or protect themselves resulting in greater amount of body injury sustained in a given crash and more serious damage to internal organs (3). Alcohol intoxication also interferes with assessing severity of injury, making a diagnosis and instituting accurate therapeutic interventions <sup>(4,5,6,7,8)</sup>.

In most developed countries, a realization of the gravity of the problem has over time led to a series of coordinated and integrated measures aimed at reduction of driving under the influence of alcohol. A series of these measures have successfully reduced alcohol related fatalities by 40% in

Europe, 35% in U.S and 40% in Australia<sup>(9)</sup>. Reducing the number of drinking drivers through legislation, enforcement and public education have played the crucial role in reducing a major cause of mortality and morbidity in the last few years<sup>(10)</sup>.

#### **4. SITUATION ANALYSIS OF ALCOHOL PRODUCTION AND AVAILABILITY IN KARNATAKA**

In the public perception, as well as in the minds of Health planners, there is this strongly held and often stated but nevertheless mythical belief that there are two distinct classes of drugs. The licit variety (implicitly safer), and the illicit variety (implicitly dangerous). This view persists despite accumulating knowledge challenging this belief. Few recognize, that, it is the socially sanctioned, excise paid drugs, alcohol and tobacco, which impose the heaviest health care and economic burden.

Information in this section has been derived from data sourced from the State Excise Department, Government of Karnataka and the Census of India, 1991

- a. The major growth in production and sales has been in the spirits / arrack segment and low alcohol content beverage sales and production has shown far less growth. There is a covert pressure to consume high alcohol content beverages in preference to low alcohol content drinks like beer and wine. The irrational and unequal taxation of spirits and beers has a lot to do with this. The Per capita consumption of alcohol in Karnataka has gone up by 114% over 10 years [1988-1998] although the total number of consumers has gone up by only 14%.
- b. The per capita availability of beverage alcohol i.e. the amount of alcoholic beverages which is available for consumption to the adult [older than 15 years] male population of Karnataka has risen from 2.96 Bulk litres of Absolute Alcohol per person per year in 1988-89 to 6.35 Bulk litres of Absolute Alcohol per person per year in 1998-99.

Less than 30% of the adult male population and a negligible fraction of the female population of the state have “ever used” alcohol. While the population of consumers appears to have gone up from 40.31 lakh individuals to 46.92 lakh individuals from 1988-1998 [a rise of 14.1%]; the per capita consumption by alcohol users in the state, during that same 10 year period appears to have increased from 9.9 litres of Absolute Alcohol equivalent per person



per year to 21.2 litres of Absolute Alcohol per person per year. That is an amazing rise of 114% from the 1988 levels. That roughly translates into the fact that the average consumption by the average alcohol user has jumped from the equivalent of 9 bottles (750 ml.) of whisky per year in 1988-89 to 20 bottles in 1998-99 (11).

## **5. CURRENT STATUS OF ALCOHOL AND INJURIES IN BANGALORE**

With increasing road accidents in the city of Bangalore, systematic efforts towards reduction have been far from satisfactory. NIMHANS has undertaken series of research activities to unravel the various dimensions of alcohol related problems in the city. NIMHANS has also been a key partner along with several other agencies in addressing this growing problem.

The international literature reveals that nearly 40% to 60% night time crashes are linked to alcohol consumption. An earlier study by NIMHANS identified that nearly 16% of brain injured individuals were under the influence of alcohol at the time of injury. The severity, duration of hospital stay, death and disability were higher among individuals with alcohol.

More recently, the role of alcohol was re-examined using data from the Neuro-trauma Registry at NIMHANS (March 2000 – March 2001) from a sample of nearly 7,000 patients registered at NIMHANS<sup>(12, 13)</sup>. It was observed that:

- ▣▣▣▣ Nearly 60% of hospital registered brain injuries were due to road accidents.
- ▣▣▣▣ 58% were men aged 16+ years.
- ▣▣▣▣ 21% of individuals were under the influence of alcohol (physician confirmed diagnosis) at the time of injury.
- ▣▣▣▣ 90% had consumed alcohol within 3 hours prior to injury.
- ▣▣▣▣ The highest proportion of road accidents and brain injuries were in 20 - 30 years age group (40%). The 15 - 20 years group and the 30 - 35 years group constituted 11% and 13%, respectively. Thus, the age group of 15 - 40 years represents 70 % of the total subjects with alcohol consumption, recorded in 22% of brain injured persons.
- ▣▣▣▣ The majority (62%) had educational levels of less than pre university levels and large numbers (53%) were employed as skilled or unskilled workers.

- ▣▣▣ Individuals with higher levels of education and working as professionals or semi-professionals were less than 5%.
- ▣▣▣ Nearly 61% were married.
- ▣▣▣ The greater proportion (40%) of road accidents occurred between 6 PM - 12 midnight. Generally the problem starts by 3 or 4 PM and reaches a peak later.
- ▣▣▣ Motorized two wheeler occupants and pedestrians were represented in greater numbers, 50% and 20%, respectively
- ▣▣▣ The accident pattern among those under the influence of alcohol was mainly skid and fall (45%), head on collision (15%), fall from moving vehicles (8%) and colliding with fixed objects on roads (6%).
- ▣▣▣ Less than 5% of drivers of those with a brain damage due to a road accident were wearing helmets (need for integrated measures - helmet usage promotion).
- ▣▣▣ Injury patterns among alcoholics and non-alcoholic groups revealed that those under influence of alcohol sustained a greater number of injuries and the severity of injury was higher (16% in alcoholic groups v/s 11% in non alcoholic groups based on GCS).
- ▣▣▣ Injury to face was also higher along with brain injuries (need for integrated measures - helmet usage promotion).
- ▣▣▣ Nearly 8% of those with alcohol consumption underwent surgical interventions compared with 5% in non-alcoholic groups.
- ▣▣▣ The case fatality rate was 6.5% in alcohol group compared with 4% in non-alcohol groups.
- ▣▣▣ Neurological Disabilities at hospital discharge was 13% among those who had consumed alcohol compared with 9% in non-alcohol group.

Also in a recent study of alcohol and injuries undertaken by NIMHANS in collaboration with World Health Organization (WHO), it was observed that 16% of emergency room attendance at Victoria hospital was due to road accidents<sup>(14)</sup>. Within this group nearly 59% were injured either due to self-consumption of alcohol or as a result of alcohol intoxication of others on the road.

These observations over a period of time have revealed that alcohol consumption among drivers is a significant risk factor for fatal and nonfatal injuries. The above findings have been shared with responsible agencies and individuals in the city of Bangalore. It is envisaged that a programme combining education, enforcement and legislation needs to be developed to contain the problem. The

present study is a major component of monitoring and evaluation activities in a broad programme of publicity and enforcement strategy aimed at reducing drinking and driving in Bangalore.

## **6. OBJECTIVES**

It is important that the forthcoming campaign is monitored for effectiveness against performance indicators. This information will be used to determine the effectiveness of the campaign and to improve future campaigns. The objectives of the proposed study are:

1. to establish the proportion of individuals injured in road accidents consequent to alcohol intoxication presenting to the casualty departments of selected hospitals.
2. to explore the knowledge, attitude and practice among drivers with regard to drinking and driving.

The present study on reduction of drinking and driving was undertaken in 2 phases. The first phase was a hospital-based study covering 12 major hospitals in the city of Bangalore. The second phase was the roadside survey undertaken during the same period. The studies were conducted during the period March 16, 2002 to 16<sup>th</sup> April 2002 by a team of trained research officers.

## **7. PHASE-I SURVEY**

### **7.1 METHODOLOGY OF HOSPITAL SURVEY**

The methodology for the hospital-based study was developed in consultation with the Bangalore city Police, Bangalore Agenda Task Force and the medical directors of selected hospitals. The purpose of this survey was to develop a situation analysis and provide bench mark observations for future comparisons in the second phase of the work.

In accordance with the requirements of (1) being representative of a wider geographical distribution of the whole city (geographical boundaries of Bangalore serving catchment areas connected with National and State highways), (2) having a large scale hospital attendance of injury patients from the community, (3) availability of reasonably good medical records, & (4) willingness to participate in the study, 12 major hospitals were identified for the survey. A preliminary meeting with medical superintendents or their representatives was held on March 6, 2002 to discuss the

methodological issues. Active cooperation was sought from all the hospitals to participate in the study. The hospitals selected for the study were ;

1. Victoria Hospital
2. National Institute of Mental Health and Neuro Sciences
3. Sanjay Gandhi Accident & Research Centre
4. K.C. General Hospital
5. Bowring & Lady Curzon Hospital
6. St. John's Medical college Hospital
7. St. Martha's Hospital
8. Mallya Apollo Hospital
9. Manipal Hospital
10. HOSMAT
11. Baptist hospital
12. M.S. Ramaiah Medical College & Hospital

14 Research officers with qualification in Sociology, Social work, rural development, economics and urban development were recruited for the study. The research officers also had prior experience in hospital and community based studies for data collection purposes. The research officers were trained over a period of 3 days to familiarize them with the purpose of the study, objectives, contents of the proforma, interview techniques and coding methods. The procedures to be adopted in casualty departments of the hospital (priority to be given for patient care, help families in referral of patients and obtaining consent from patients or family members) was completed. A brief pilot study was undertaken in the hospitals prior to the main study.

A semi-structured questionnaire was developed to gather information for the study. The body of information focused upon hospital details, injury details, socio-demographic details, road user category, nature of drinking (place, type, reasons , interval and others), reporting to the police firstaid care and management details along with the outcome in the emergency rooms.

The levels of alcohol consumption were elicited through the Y-91 codes as proposed by World Health Organization. In all instances the casualty medical officers (CMO's) were requested to document alcohol level consumption based on clinical Judgement and standardized protocol. CMO's

in one major hospital had earlier participated in a WHO study on alcohol & injuries. Huge posters which gave detailed instructions in assessing and grading levels of intoxication [Y91 codes] were placed in casualty to enable doctors to record levels. The following details about coding were adopted and these were standardized as part of an earlier study.

### **Y91.0: Mild alcohol intoxication**

Slight smell of alcohol on breath, facial flushing, slightly slurred speech, slight impairment of fine motor co-ordination, slight difficulties in postural control tasks, talkativeness, enhanced sociability, increased self-confidence, slightly altered attention and / or judgement, some relaxation/lowering of inhibitions, mild euphoria, unimpaired ability to co-operate due to intoxication, horizontal gaze nystagmus >40 degree (HGN).

For other people it is not always obvious that the person is intoxicated even if interacting with them or performing simple coordination-demanding tasks. However, people, who knows this persons well, often can easily recognize intoxication.

### **Y91.1: Moderate alcohol intoxication**

Smell of alcohol on breath, facial flushing, red or watery eyes, slurred speech, decreased motor co-ordination, prominent difficulties in postural control tasks, impaired balance, garrulousness, clearly impaired attention and / or judgement, impaired communication, moderate disturbances in emotional and behavioural functions and responses, euphoria, elation or irritated mood, emotional instability, reduced level of frustration tolerance, slightly or moderately impaired ability to co-operate due to intoxication, horizontal gase nystagmus < 40 degree (HGN).

For other people it is obvious that a person is intoxicated if interacting with them or performing coordination-demanding tasks. However, moderate alcohol intoxication is not always obvious for other people without interaction with them or performance of coordination-demanding tasks.

### **Y91.2: Severe alcohol intoxication**

Prominent smell of alcohol on breath, severely slurred speech, gross unsteadiness, severe difficulty in co-ordination, staggering gait, irrational behaviour, severely impaired attention and/or judgement, severely impaired communication, severe disturbances in emotional and behavioural

functions and responses, euphoria, elation or irritated mood, significantly reduced level of frustration tolerance, aggressiveness, clearly/severely impaired ability to co-operate due to intoxication.

For other people it is obvious that a person is severely intoxicated even without any interaction with them. It is possible to establish communication with a person, though communication and interaction are severely impaired due to intoxication.

### **Y91.3: Very severe alcohol intoxication**

Prominent smell of alcohol on breath, disoriented / asleep and difficult to arouse / comatose, unable to walk without assistance or severely stumbling and staggering when walking, unable to communicate and co-operate due to intoxication, respiratory and circulatory depression, death.

It is always unclear whether a person is soporose / comatose due to alcohol intoxication or other medical condition, or both.

The following clinical conditions can present the above-listed signs of alcohol intoxication:

- ◆ Drug intoxication
- ◆ Head injury (incl. Subdural hematomas)
- ◆ Hypoglycaemia
- ◆ Encephalitis
- ◆ Diabetic ketoacidosis
- ◆ Postictal status
- ◆ encephalopathy

Written permission and consent was obtained from all the hospitals participating in the study. The research officers were introduced to the Casualty departments and were familiarized to the data collection purposes. The actual data collection was undertaken during the period 16.3.2002 to 17.04.2002.

## **7.2 DATA MANAGEMENT**

The entire survey was monitored at two levels. Firstly, the research team met every 4<sup>th</sup> consecutive day to review the progress of work and to identify problems in data collection. A continuous feedback was provided to the research staff to strengthen the quality of data on a day-to-

day basis. The progress of work was also monitored at higher levels with periodical meetings between BATF, Bangalore city police and NIMHANS with feed back to the programme managers, police and survey teams. The entire data was checked for completeness and coding regularly and data has been analyzed using Epi-Info version 6 on several parameters.

### 7.3 RESULTS

*(Detailed description of data is available in Annexure-I in tabular formats. Further, in each of the tables data is presented under separate headings of Daytime injuries, Night time injuries with alcohol and Night time injuries without alcohol for comparison on several parameters).*

1. During the study period of one month a total of 1605 persons were registered in various hospitals of Bangalore city. This included accidents occurring both within the city limits of Bangalore and also those occurring outside the city (including patients referred from outside hospitals). Among the total cases, 778 (49%) and 827 (51%) had occurred in daytime and nighttime, respectively.
2. Among nighttime injuries (n=827), 184(22%) persons were under the influence of alcohol at hospital entry time. 73% were not under the influence of alcohol and status was not known in 5% of cases.

In the total sample, a selective examination of men above 15 years and less than 60 years (n=1397), revealed that 11% were injured while driving under the influence of alcohol. The mean age of injured persons was 32.6 +/- 14.1 years.

However, among nighttime crashes and in men of 15-59 years, the proportion of road traffic injuries related to driving under the influence of alcohol was 28%. The mean age of persons under the influence of alcohol and involved in road traffic injury was 33.0 +/- 10.4 years. This indicates that one fourth of nighttime hospital registrations in this age group are directly linked to driving under the influence of alcohol (table 1.1)

Among those injured persons under intoxication highest age of occurrence was in 20 – 34 years to the extent of 60% (20-24 years – 17%; 25-29 years – 25%; 30-34 years – 19% and 40-44 years – 10%) (Table 1.2).

3. The ratio of men to women in the total series was 1:6. The proportion of women under the influence of alcohol was nil, except one two-wheeler driver (Table 2).
4. The educational status of injured persons revealed that those with less than 7 years of formal education were 14%, with 8-12 years was 22%, with graduate levels and above was 11% in the total series. A comparison between alcohol + or – groups indicated that in the former group, <7 years, 8-12 years and 12+ levels of education was 23%, 48% and 21% as against 33%, 44% and 19%, respectively. The distribution of those with professional levels of education was 2-3% each in both groups, respectively. A statistically significant association ( $P<0.001$ ) was noticed between education and alcohol related road traffic injuries (Table 3).
5. The occupational levels of road injured persons was 4%, 28%, 29%, 3%, 11%, and 2% and in professional, semiprofessional, skilled, semiskilled, unskilled, and retired groups, respectively. Students constituted 16% of total series. Among those under the influence of alcohol, semiprofessional and skilled categories constituted 24% and 43%, respectively, with students accounting for 9% of total series. However, students, skilled workers and semiprofessionals were represented in greater numbers in the overall nighttime crashes (Table 4).
6. Nearly 75% of accidents had occurred within Bangalore city limits during the one-month period. Those with alcohol influence were 26% (152/571) in comparison with 8% (19/237) occurring outside Bangalore (Table 5).
7. In the total series, Pedestrians, two wheeler riders and occupants constituted 25%, 35% and 6%, respectively. Bus passengers, matador passengers and bicyclists were under the influence of alcohol in 5%, 5% and 4% of injuries, respectively.

Among those under the influence of alcohol, 58% of injured persons were two wheeler riders and pillion riders, while pedestrians accounted for 23% of registered persons. Car occupants constituted 5% of total series in the study. Autorickshaw drivers and passengers accounted for 8% injuries. In sharp contrast, two wheeler occupants were only 35% in non-alcohol group, followed by pedestrians (24%), bus passengers (9%), car occupants (8%),



bicyclists (6%) and other groups. This clearly indicates that two wheeler riders and pedestrians need to be targeted on priority basis for reduction of problem (Table 6).

8. Information on nature of colliding vehicles/objects was known in 1283 road traffic injuries. The injured person and vehicle was hit by two wheelers (22%), Bus (12%), Lorry (17%) and cars (14%) in majority of crashes. Auto rickshaws and Matadors were responsible for 8% and 9%, respectively.

Two Wheelers (24%), Lorry (12%), Matador and cars (10% each) were the major vehicles colliding with the vehicle of injured person while the injured person was intoxicated (Table 7).

9. Hit and run and head on collision was the major nature of injury mechanism in 19% and 17%, respectively. Side angle collision and skid-fall was common in 10% and 15% of crashes.

Under the influence of alcohol, the commonest patterns were skid-fall (28%), head on collision (18%), and hit and run (16%) accidents. Skid & fall was less while the person was non-intoxicated (12%) as depicted in table 8.

10. The place of drinking prior to crash revealed that primarily it was bars (64%), drinking in retail stores (8%) and in private parties (3%). Information was not available in 21% of crashes (Table 9).
11. Whisky (30%) and Rum (22%) were the commonest drinks consumed by alcohol + individuals to the extent of 52% in the series. This was followed by beer (14%), brandy (8%) and arrack (4%) among the rest (Table 9).
12. In the drinking pattern that emerged in the study, nearly 56% of whisky / rum/ brandy drinkers had consumed around 3 pegs (Table 12). 25% had more than 6 pegs (can one drive!) in the series. Beer drinkers had generally 1-2 bottles (Table 10).
13. Nearly 40% of drivers/persons involved in a crash had consumed alcohol approximately one hour prior to injury, while 33% in less than 2 hours period (Table 11).

14. Individuals consume alcohol for a variety of reasons and excuses. In the present study, the commonest reasons for drinking were as a habit (43%), pleasure seeking (32%), to overcome family problems (12%) and others as shown in table 13.
15. Table 14 shows that the situation of drinking in the series was drinking alone (37%), or drinking with friends/colleagues (37%) to be the commonest methods among injured persons being under the influence of alcohol (Table 14).
16. Among patients seen in hospital, nearly 36% expressed that they were confident to drive after drinking, while 28% were not sure of the same. Only 4% clearly indicated that they were not confident and had difficulties (but still had driven) after drinking (Table 15).
17. Table 16 indicates as to what happens after a road traffic injury in and around Bangalore. Only 15% received some type of first-aid or (?) prehospital care in the series and nearly 65% did not receive any care (arrived directly to hospital without any first aid care). Amongst those with alcohol intoxication, these figures reduced to 12% in comparison with 22% of those without alcohol influence. The injured person was taken to the nearest hospital and was subsequently referred to the study hospital. Among those who received care, it was generally in nearby private hospitals or clinics within the city and in general hospitals outside city.
18. In the total series, only 58% were reported to police, indicating that nearly 42% were underreported. This observation is in conformity with earlier studies at NIMHANS with underreporting rates of 50% and 5-10% for injuries and deaths, respectively (Table 17).
19. The mode of transportation of injured persons was primarily by Ambulance (24%), private vehicle (19%), Autorickshaws (19%) and public / Hoysala vehicles (5%).

However, among crashes during nighttime and in those with alcohol consumption, it was primarily Auto rickshaws (30%), ambulances (22%), private vehicles (17%) and Hoysalas (16%) as shown in table 18. The involvement of Hoysalas in nighttime crashes is worth appreciating, as other modes of transportation are difficult to get at this time.

20. The status of injured person at hospital entry was that nearly 80% were conscious, 15% were unconscious and 1% had died in the total series.

Among those with alcohol and without alcohol the pattern was similar with 70% being conscious and 23% being unconscious. However, 1.2% of those under alcohol influence were brought dead in comparison with 0.5% of non-alcoholic persons, requiring further examination (Table 19).

21. The level of alcohol intoxication observed by ER physician / trained research staff in all nighttime road traffic injuries is shown in the table 20. It was noticed that 13%, 47%, and 38% were intoxicated at moderate, severe and very severe levels. Surprisingly, there was no individual at mild intoxication levels (table 20).
22. The nature of injuries in the total series was based on ER record documentation based on clinical observations. It was noticed that 52%, 14%, 26% and 8% had simple injuries, fractures, head injuries and other injuries respectively. This pattern changed among those with and without alcohol intoxication. Simple injuries (50% Vs 45%), fractures (17% Vs 14%) and brain injuries (30% Vs 35%) were more frequently reported in nighttime crashes (Table 21). Nearly one third of night time crashes had a clinician documented brain injury.
23. The mode of management revealed that 51% received care at casualty level and were referred to other places, 40% were hospitalized in same hospitals, 4% were operated immediately and 2% were taken for ICU management (table 22).
24. The outcome of the present series indicated that while 3% died in casualty / ER, only 38% noticed good recovery. Nearly 1% had entered in to a persistent Vegetative state indicating long term rehabilitation needs. Disabilities of severe and moderate levels were present in 26% and 33% of patients.

The death rate among those with alcohol intoxication was 2.3% compared with 1.4% of nonalcoholic individuals.

## **8. ROAD SIDE SURVEYS**

### **8.1 METHODOLOGY**

This particular component aiming at identifying the knowledge, attitude and practice of the vehicle riders along with their knowledge towards harmful effects of drinking and driving was undertaken during the period 17.3.2002 to 17.4.2002. Two research officers were trained in data collection mechanisms and were familiarized with the enforcement team. Apart from breathalyzer results, the information collected during this period focused upon the socio-demographic characteristics of the riders, drinking habits, legal awareness about drinking, difficulties experienced, awareness of the penalties and knowledge of family members.

The Bangalore city police constituted two enforcement teams with each team consisting of a senior inspector and 4-6 constables. A list of checkpoints for day-to-day assessment was planned prior to survey and was kept confidential. During the study period a total of 34 sites were selected and each of the sites was revisited after 15 days time by the same team. Thus, each site, was covered twice by the same team at an interval of 15 days. The pre-identified check points had space for 3-6 vehicles to be pulled up without obstructing the flow of traffic. The high visibility roadside checks were conducted in locations with the presence of sign boards (indicating drunk driving check points, traffic cones, police having reflective visible jackets and presence of barricades). The timings for the road side surveys were between 9.00 pm to 12.00 am on week days and between 8.00pm to 12.00 am during week ends. It was envisaged that drivers would be stopped randomly and interviewed on the spot and administered a breath analyzer to document the breath alcohol levels. Notice of the programme was disseminated by the Police Commissioner, Bangalore, to the public through the local newspapers indicating the beginning of the study from a particular date and seeking public co-operation.

The operational work flow decided upon was that:1] Vehicles would be stopped randomly at checkpoints, 2] the drivers administered breath tests, 3] the roadside interview would be completed and then 4] the driver of the vehicle and the occupants if any would be informed of the hazards of driving under the influence of alcohol, while also being given a flyer specially prepared to give relevant information about the hazards and the legal aspects of driving while intoxicated.

However, in the first 15 days, the police due to certain exigencies, resorted to stopping and testing drivers on suspicion. Only wherever there was a doubt in the minds of the personnel on duty, the road users were subjected to breath analyzer testing. This variation could have influenced study results significantly. With feed back to police, this procedure was changed to one of random stopping of road users and checking of all those who were stopped, regardless of whether they evoked suspicion of being intoxicated or not. This marked the second phase (April 2, 2002 to April 17, 2002). Hence the results have been provided in two batches of before and after 1<sup>st</sup> April.

The survey team completed the interviews and a breath alcohol reading was obtained. The drivers were informed of the levels, informed about harmful effects of drinking and driving and were provided a flier giving details of the programme. During the period, no driver was imposed with any penalties for drinking and driving, (however, the police continued with enforcement on other issues like driver license, vehicle checks and other issues). The procedures for total assessment of alcohol intoxication levels were done as follows.

Y90.1 - Blood alcohol level of 20-39 mg/100 ml	}	Nil
Y90.2 - Blood alcohol level 40-59 mg/100ml		
Y90.3 - Blood alcohol level 60-79 ml/100 ml	}	Mild intoxication
Y90.4 - Blood alcohol level 80-99 ml/100 ml		
Y90.5 - Blood alcohol level 100-119 ml/100 ml	}	Moderate intoxication
Y90.6 - Blood alcohol level 120-199 ml/100 ml		
Y90.7 - Blood alcohol level 200-239 ml/100 ml	}	Severe intoxication
Y90.8 - Blood alcohol level 240 ml/100 ml or more		
Y90.9 - Presence of alcohol in blood, level not specified		

## 8.2 DATA MANAGEMENT

The entire survey was monitored at two levels. Firstly, the research team met every 4<sup>th</sup> consecutive day to review the progress of work and to identify problems in data collection. A continuous feedback was provided to the research staff to strengthen the quality of data on a day-to-day basis. The progress of work was also monitored at higher levels with periodical meetings between BATF, Bangalore city police and NIMHANS with feed back to the programme managers, police and survey teams. The entire data was checked for completeness and coding regularly and data has been analyzed using Epi-Info version 6 on several parameters.

## 8.3 RESULTS:

1. A total of 34 checkpoints were identified for the study and survey was undertaken by two teams. The methodology varied between two time periods viz., 16.3.02 – 01.4.02 (Phase I focused on strong police suspicion) and 02.04.02 – 17.04.02 (Phase 2 focused on randomness). The average number of checks done every day was  $19 \pm 7$ .
2. In the entire period a total of 5199 vehicle riders were stopped for breath alcohol assessments (table 1). In phase I (suspicious checks by police), 3333 riders were checked, among whom 215 were stopped and tested on strong grounds of suspicion. Among them, 193 (6%) tested positive for alcohol above the legal limits of 0.03 mg/100 ml, resulting in an incidence rate of 6%. In Phase – II (random checking), a total of 1,866 riders were observed and 491 (25%) were stopped randomly. Among them, 203 tested positive for alcohol, yielding an overall incidence rate of 11% (203/1866). However, all 480 were administered breath analyzer in second phase among whom 203 tested positive with a rate of 42%. Among the 203 individuals testing positive, 169 (35%) were above the stipulated legal limits. The mean age of drivers under the influence of alcohol was  $34.2 \pm 8.4$  years. Given the limitations of methodology in random testing, we estimate that 30-40% drivers drive under the influence of alcohol on the roads of Bangalore city.
3. Table 2 reveals the age distribution of tested persons in the study. The peak age of drinking and driving problem was 25-29 years (24-28%), followed by 30-34 years (19-25%) and 35-39 years (16-19%). Smaller numbers were included in other age groups as well. There was a statistically significant association between age and drinking pattern ( $P < 0.001$ ). The entire

survey population comprised of only men, and women were not stopped / checked due to sociocultural issues.

4. The educational levels of those who were checked for alcohol intoxication during the study period indicated that 31% and 28% had high school levels and graduate levels of education with a total of 75% in the range of 8-15 years of education. The pattern was similar among intoxicated individuals with nearly 60-70% with the same levels of education (Table 3).
5. Information with regard to occupational status revealed that nearly 70% were employed in semiprofessional and skilled labour categories. This group included teachers, pharmacists, social workers, owners of small business, managers, farmers, artisans, clerks, foremen, supervisor, carpenter, tailor, mechanic electrician, railway guard, painter, model, smiths, bakers, drivers, shop assistants, petty traders, constables, soldiers, linemen, pointsmen, potters, barber and others like tinkering workers, printers, receptionists, salesmen, welders, gardeners, cooks, masons, postmen, plumbers and agarbathi workers Surprisingly, students were not represented in this group (Table 4).
6. The distribution of various road users revealed that 79% of those under the influence of alcohol were predominantly two wheeler riders. This group was followed by bus drivers and matador drivers among the alcohol intoxicated group to the extent of 12% each. The other categories represented were passengers in matadors (3%), drivers of matadors (3%) and pedestrians (5%) (Table 5).
7. The level of alcohol intoxication was established through breath analyzers. The results as shown in table 6 revealed that only 24% of them were below the breath alcohol limits of 39 mg/100 ml. The remaining individuals were above legal limits. Nearly 40% were in the levels of 40-99 mg/100 ml, followed by 27% in the 80-119 mg/100 ml. Severe levels of intoxication were found in 10% of those tested positive. Information from phase 1&2 of the survey indicated that police suspicions were high on severely intoxicated, while random testing identified more of moderately intoxicated individuals along with severe ones.

8. With severe and moderate levels of intoxication as mentioned earlier, nearly 40% of them had consumed spirits [hard liquor] like whisky/rum/brandy. The proportion of beer drinkers was nearly 50-55% from both phases of the survey (Table 7).
9. Nearly all the drivers tested remembered the amount of consumption prior to checks. Among those who had consumed beer, 75% of them had taken around 1 bottle of beer with another ¼ resorting to 2 or more bottles of beer. With regard to those consuming hard liquor in the first round of survey, more than 90% had taken more than two pegs with nearly 25% consuming more than 4 pegs (Table 8). In the phase-I survey of police suspicion, 15% had consumed more than 6 pegs, while phase II revealed and detected large number of moderate drinkers (Table 8).
10. The place of drinking was predominantly local bars in 70% of the riders. People consuming alcohol in parties were 16% in the total series. Surprisingly, it was noticed that nearly 12% of those tested positive were home drinkers in sharp contrast to drinking in five star hotels (1%) (Table 9).
11. All the alcohol positive individuals had their drinking sessions either alone (40%) or with friends/colleagues (45%) (Table 10).
12. It was interesting to note that 98% of tested positive individuals were confident to drive after drinking (compare with type and quantity of drinking mentioned above), thus indicating the lack of awareness of people with regard to drinking and driving and the effects of alcohol on vision, reflexes, coordination and judgment. (Table 11).
13. 97% of the persons reported that they were fully aware of the fact that driving under the influence of alcohol is not permitted by Indian law and Indian motor vehicles act. Still people had continued to drive after drinking (Table 12).
14. While 97% were aware that drinking and driving is not permitted by law, only 3% were aware of the legal implications with regard to imposition of penalties, seizure of the vehicle and appearance before a court. The study identified that 97% were totally unaware of the legal implications (Table 13).



15. Among the surveyed individuals 99% of the subjects reported that drinking and driving is dangerous both for themselves and for others on road. However, this knowledge did not prevent them from driving after drinking (Table 14).
16. In the surveyed population all 100% of the respondents mentioned that accidents will not happen after drinking.
17. With the changing culture in the city it was not surprising to know that with nearly 70% of the tested individuals, their respective families were aware of their drinking habits, thus indicating the family responsibilities & implications of drinking and driving (Table 15).

## **9. IMPLICATIONS AND EMERGING ISSUES**

1. With increasing production and availability of alcohol along with changing societal values, alcohol consumption has been significantly increasing among Bangaloreans and in general, all over the country. The effect of alcohol on injuries (road traffic injuries, falls, suicide, violence, child and family violence, burns, poisoning, drowning and others) has been scientifically examined all over the world and reported regularly in the media. Despite massive evidence on negative effects, societal mechanisms to prevent the burden and impact have been far from satisfactory. It is obvious that no interventions are being planned in any of the Indian urban and rural places.

The present study, is the first one to examine alcohol and road traffic injuries on a larger scale at the city level, under “SURAKSHA SANCHAR” programme.

2. With nearly 1200 (out of 1600) persons injured on the roads of Bangalore in one month period, the problem of road traffic injuries is a serious threat to the healthy growth of Bangalore. While caution has to be exercised in generalizing results due to short duration and small sample size, it can be estimated that nearly 12,000 persons will be injured every year. This reflects on the extent of under reporting (40%) compared with official figures of 6500 per year and the huge burden of road traffic injuries. Nearly 28% of injured persons and 35% of adult – male – night time drivers were under the influence of alcohol.

3. A large number of those injured and killed under the influence of alcohol are young men, studied upto Pre-university levels and employed in medium or low level jobs. Two wheeler riders - Pedestrians are the greatest risk groups for drinking and driving. Skid - Fall and head on collisions with incoming vehicles emerges as the commonest pattern. Collisions with heavy vehicles (bus, lorry, car, matador) and other two wheelers leads to greater injuries with nearly one third sustaining brain injuries. Alcohol by impairing vision, reflexes, judgment and coordination is a major link in the causation of these accidents coupled with other factors.
4. Keeping with the emerging culture, consumption of heavy liquor (whisky, rum, brandy) predominantly in bars either alone or with friends/colleagues and driving on the road immediately, emerges as the major pattern in Bangalore. The reasons for drinking were mainly “habit drinking” and “pleasure seeking”. The levels of drinking at severe and moderate levels by 75% of injured persons only reflects on “Heavy drinking” and “Hazardous drinking”.
5. 98% of drivers were confident to drive after drinking with few informing “Not known or Can’t say”. This reflects the risk taking behaviour of people combined with lack of awareness on hazards of drinking and driving
6. The obvious lack of emergency care is reflected clearly in the present study, with more than 50% having serious injuries like fractures and brain damage. The study did not use any standard injury severity scales for obvious reasons and an arbitrary clarification was adopted. The incidence of brain injury and deaths were high in alcohol groups compared with no alcohol group.
7. 40% of those randomly tested on road side were positive for alcohol. Further, 35% of the total sample were test positive beyond the legal limits. This should be a matter of serious concern as these persons can cause injuries to self or create dangers for others on roads. 60-70% were young (25-39yrs), all men, educated between 8-12 grades and graduates, and recently employed in skilled occupational categories.
8. Consumption of heavy liquor (whisky, rum, brandy) by nearly 50% of alcohol influenced drivers, primarily in bars or in parties (83%), either alone or with friends (75%), drinking around 1 or 2 bottles or more than 2 units of hard liquor (upto 9 by some people) emerged as the

drinking pattern. Since large majority (75%) were traveling on two wheelers, it can be a dangerous issue on roads as there will be major difficulties with regard to vision, reflexes and coordination, specially during night times. Further, nearly 80% were intoxicated at moderate and severe levels beyond legal limits posing difficulties on the road.

9. It was interesting to note that, 98% reported that they were confident to drive after drinking (how can one be confident after 5 pegs of Whisky/ Rum). While everyone (97%) knew that drinking and driving is not permissible under Indian Motor Vehicle Act, 99% agreed that it is a dangerous act, only 3% were aware of the legal implications. This reflects on one's own awareness and enforcement practices in the city in a way, as no one was aware of penalty levels, vehicle seizures or court battles. This clearly indicates that people were some what knowledgeable about health but were unaware of the legal and enforcement issues while continuing with their risk taking behaviour.
10. Response of the 50% surveyed population on roads revealed that their family members were aware of their drinking, but did not know the levels of drinking nor dangers of driving after drinking, This situation reflects on several aspects like "high risk taking behaviour", "less concern for family" and "accepting that he comes home drunk". Simultaneously, it also gives enormous opportunities to involve family members, especially women in reducing harm from alcohol.

#### **10. LIMITATIONS OF THE STUDY:**

The city of Bangalore with a population of 6 million (4 million adult population) has unlimited and uncounted alcohol selling units, nearly 18 lakh vehicle riders, more than 300 hospitals and unknown number of total roads. The present study was undertaken in only 12 of the major hospitals and in 34 checkpoints over a period of 30 days. Hence, generalizations of the study findings must be made with "caution and concern". Undoubtedly, the findings indicate the need for larger studies on a wider scale and definitely indicate only the tip of the iceberg.

#### **11. SUMMARY AND CONCLUSION:**

The present study on "Reduction of drinking and driving in Bangalore" is part of a larger road safety "SURAKSHA SANCHAR" project. This is a public-private partnership project between

Bangalore Agenda Task Force, Bangalore City Police, National Institute of Mental Health & Neuro Sciences, Global Road Safety Programme, International Centre for Alcohol Policies and Society for Alcohol related Social Policy Initiatives. Over a one month period (16-03-02 to 17-04-02), information was gathered from 1600 patients - 890 night time patients registered in 12 major hospitals to identify the extent of alcohol involvement in road traffic injuries. Simultaneously, information on drinking and driving patterns was collected from 34 checkpoints spread over the city from 708 respondents.

Hospital studies indicated that 28% (25-30%) of night time crashes could be linked to alcohol consumption. Young men driving two wheelers, consuming hard liquor in excessive amounts on majority of occasions, either alone or with friends was the risk behaviour. Severe injuries with lack of pre-hospital care only made injuries more severe with the fact that alcohol drivers had substantially higher death rates compared with non-alcohol drivers.

Road side surveys indicate that 11% of suspicious drivers and 35% of randomly checked drivers were positive for alcohol. Among those under the influence of alcohol 83% were above the legally permissible limits. Once again it was the young male, educated between 8-15 yrs, consuming hard liquor in excessive amounts in bars, either alone, or with friends as the emerging pattern. Further while more than 95% knew that drinking and driving in dangerous and risky and not good for health, only 3% were aware of legal and enforcement aspects.

Scientific research has established beyond doubt that alcohol impairs vision, reflexes, judgment and coordination. Diminished inhibitions due to alcohol only propels an individual towards high risk behaviour. Undoubtedly, preventive programmes encompassing, enforcement with stiff penalties, awareness building and system changes to reduce alcohol consumption are urgently required to save precious lives and to make roads safer in the days to come.

## **12. WHAT WORKS AND WHAT DOES NOT WORK?**

Realizing the grave dangers of drinking and driving, findings from the present study and large number of opinions expressed by people, the following recommendations are put forth for the considerations of policy makers, professionals, public and press.

1. Strict enforcement programmes with stiff penalties must be undertaken by the police department. These enforcement programmes must be continuous, visible (all over the city), uniform and spread over the whole year. In order to ensure public participation, awareness about enforcement aspects must be communicated to citizens.
2. The police department should identify and train a team of 10 inspectors and 30 constables. They should be trained on various aspects of enforcement issues, standardization of procedures, calibration of breath analyzers, documenting information and public interaction. This team should work in a focused manner throughout the year in the city.
3. In order to prepare public about dangers of drinking and driving, awareness campaigns with local media should be undertaken on a continuous basis with available scientific data on a socio-culturally acceptable method.
4. Awareness programmes must be focused upon those in 25-45 years age groups, two wheeler drivers, heavy vehicle drivers, people drinking in bars and retail stores.
5. Systematic training and awareness programmes must be undertaken for bartenders and retail shop owners to limit the sale of alcohol for customers, specially for those getting into dangerous levels.
6. Community awareness programmes with family involvement should be undertaken to influence “people who drink” to motivate them “not to drink and drive”.
7. Prominent information bulletins must be disseminated in all hospitals, bars, public places, college and schools informing people about legal limits of alcohol and consequences of penalties, vehicle seizure and court proceedings.
8. Governments should consider seriously the timings with regard to closure of bars and limiting last minute services in bars (to one hour before closure). Also, public transport must become easily accessible and available to deter people from driving after drinking.
9. The city administrators and planners along with concerned citizens’ groups should develop long term measures to tackle the problem by bringing about changes in systems and environments rather than isolated one time efforts.
10. A hospital based surveillance (active reporting system) must be established in the city to report all road traffic injuries (on few vital parameters) to document long term changing patterns and to track the ongoing epidemic. Further, all hospitals should compulsorily check for breath/ blood alcohol levels among traffic injuries.

### **13. OPERATIONAL PROBLEMS AND ISSUES**

1. Since there is no uniform and mandatory reporting of road traffic injuries from hospitals, the present study was undertaken in a specified manner. In order to track this ongoing and evolving epidemic, hospital based surveillance forms a basic prerequisite.
2. Compulsory checking for drunken driving is not in practice with city police department. This needs to be inbuilt into the system.
3. Police officers were specially drawn for this project and there is no special squad which regularly looks at this issue.
4. Since officers were drawn from different parts of the city, it was difficult for them to do this task on a regular basis.
5. The breath analyzers need to be calibrated regularly and not doing this posed difficulties.
6. Area-wise teams not being in place, one central team will have difficulties in long term operations.
7. Public understanding and cooperation is vital for such a programme. Public arguments of using power, influence and money should be ignored by police.
8. There is a need for public health approach in the programme and requires cooperation from alcohol selling outlets and manufacturing units to promote healthy life.

### **14. SOME PUBLIC REACTIONS....**

- ◆ Nearly 70% of the public reported this was a good programme. However, 30% felt it was a waste of time and resources.
- ◆ Enforcement staff must be drawn from same geographical locality and not from other end of the city. This would also increase motivation among staff.
- ◆ Many people turned their vehicle backwards after seeing police barricades, cones, and jackets from a distance (they must have known there was a check for drinking and driving or license-probably drunk).
- ◆ A fine of Rs.100 – 500 was not affecting many people and were prepared to pay penalty as elicited in the survey (60% respondents). People were prepared to pay this fine and go home.

- ◆ If vehicles of heavy drinkers/ matadors/ cars are stopped, police have difficulties in shifting these vehicles to stations.
- ◆ Whenever individuals are stopped, people inform their contacts (friends to ministers to rowdies) and argue that because of their power, they should be left away.
- ◆ The breath analyzer readings were not understood by public on a number of occasions. They just asked “so what”, “tell me what to do next”.
- ◆ Many people (70%) did not want their families / employers to know that they were caught by police due to drinking. Survey results also indicated that their families were aware of their drinking practices.
- ◆ See this argument: 1 glass beer will give a reading of 50-60mg/100 ml. But legal limit is 30mg/ 100ml. How is this logical. Who will drink half glass beer and go home. The law should be changed accordingly.
- ◆ Governments give license for opening of bars and pubs all over the city. All television channels and magazines advertise about alcohol. How can police control this menace by just checking once in a while. This will not work and is only a game.
- ◆ Nobody can read ‘fliers on drinking and driving’ at 12 o’ clock in the night. They said they will read it the next day and put it in their pockets or scooter boxes. Did they read it ‘tomorrow’?

## 15. THE WAY FORWARD

The present scientific study was the first step in awareness - enforcement program. This information should be discussed across forums in the society, develop campaign materials based on local data and sociocultural practices, **commit and implement strict no nonsense enforcement**, and evaluate the results scientifically. In the long run, it is vital for Bangaloreans to move towards safety on roads, rather than paying a heavy price for deaths-disabilities-injuries linked to alcohol.

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## **Annexure – I. HOSPITAL SURVEY**

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Table 1.1: Distribution of Injured Persons as per Age

AGEGROUP	STATUS				Total
	1	2	3	4	
0 to 14	54	0	51	0	105
	6.9%	0.0%	8.4%	0.0%	7.0%
15 to 19	32	6	44	0	82
	4.1%	3.3%	7.2%	0.0%	5.0%
20 to 24	130	32	119	9	290
	16.7%	17.4%	19.5%	26.5%	18.0%
25 to 29	135	45	98	10	288
	17.4%	24.5%	16.1%	29.4%	18.0%
30 to 34	96	35	73	2	206
	12.3%	19.0%	12.0%	5.9%	13.0%
35 to 39	72	14	54	4	144
	9.3%	7.6%	8.9%	11.8%	9.0%
40 to 44	68	19	43	2	132
	8.7%	10.3%	7.1%	5.9%	8.0%
45 to 49	65	15	45	2	127
	8.4%	8.2%	7.4%	5.9%	8.0%
50 to 54	48	6	14	2	70
	6.2%	3.3%	2.3%	5.9%	4.0%
55 to 59	25	6	26	1	58
	3.2%	3.3%	4.3%	2.9%	4.0%
60 +	53	6	42	2	103
	6.8%	3.3%	6.9%	5.9%	6.0%
Total	778	184	609	34	1605
	48.5%	11.5%	37.9%	2.1%	100%

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Status -

- 1 = Daytime road traffic injury subjects
- 2 = Night time road traffic injury subjects under the influence of alcohol
- 3 = Night time road traffic injury subjects NOT under the influence of alcohol
- 4 = Night time road traffic injury subjects whose alcohol status was not known

Table 1.2 : Age Distribution And Alcohol Status Among Men 15 + Age Groups

AGEGROUP	STATUS				Total
	1	2	3	4	
0 to 14	36	0	37	0	73
	5.5%	0.0%	7.4%	0.0%	5.3%
15 to 19	29	6	38	0	73
	4.4%	3.3%	7.6%	0.0%	5.3%
20 to 24	118	32	100	7	257
	17.8%	17.5%	20.0%	25.9%	18.7%
25 to 29	125	44	85	9	263
	18.9%	24.0%	17.0%	33.3%	19.2%
30 to 34	83	35	62	2	182
	12.5%	19.1%	12.4%	7.4%	13.3%
35 to 39	60	14	44	2	120
	9.0%	7.7%	8.8%	7.4%	8.7%
40 to 44	58	19	39	1	117
	8.7%	10.4%	7.8%	3.7%	8.5%
45 to 49	50	15	38	1	104
	7.5%	8.2%	7.6%	3.7%	7.6%
50 to 54	43	6	12	2	63
	6.5%	3.3%	2.4%	7.4%	4.6%
55 to 59	19	6	18	1	44
	2.9%	3.3%	3.6%	3.7%	3.2%
60 +	42	6	26	2	76
	6.4%	3.3%	5.2%	7.4%	5.7%
Total	663	183	499	27	1372
	48.3%	13.3%	36.4%	2.0%	100%

Table 2: Sex Distribution

SEX	STATUS				Total
	1	2	3	4	
Male	663	183	499	27	1372
	85.3%	99.5%	81.9%	79.4%	86.0%
Female	114	1	110	7	232
	14.7%	0.5%	18.1%	20.6%	14.0%
Total	777	184	609	34	1604
	48.4%	11.5%	38.0%	2.1%	100%

---

Status -

- 1 = Daytime road traffic injury subjects
- 2 = Night time road traffic injury subjects under the influence of alcohol
- 3 = Night time road traffic injury subjects NOT under the influence of alcohol
- 4 = Night time road traffic injury subjects whose alcohol status was not known

Table 3: Education Status among Persons with a Traffic Injury

N10EDUDATI	STATUS				Total
	1	2	3	4	
Illiterate	40	23	109	4	176
	29.0%	14.9%	21.1%	18.2%	21.2%
Primary	8	4	30	0	42
	5.8%	2.6%	5.8%	0.0%	5.0%
Secondary	7	9	35	0	51
	5.1%	5.8%	6.8%	0.0%	6.1%
High school	25	54	176	4	259
	18.1%	35.1%	34.0%	18.2%	31.2%
PUC	17	21	52	5	95
	12.3%	13.6%	10.1%	22.7%	11.4%
Vocational	5	10	17	1	33
	3.6%	6.5%	3.3%	4.5%	4.0%
Graduate	28	28	81	6	143
	20.3%	18.2%	15.7%	27.3%	17.2%
Post Graduate	1	2	5	2	10
	0.7%	1.3%	1.0%	9.1%	1.2%
Professional	5	3	10	0	18
	3.6%	1.9%	1.9%	0.0%	2.2%
Not Applicable	2	0	2	0	4
	1.4%	0.0%	0.4%	0.0%	0.5%
Total	138	154	517	22	831
	16.6%	18.5%	62.2%	2.6%	100%

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Table 4: Occupational Categories in Road Traffic Injuries

OCCUPATION	STATUS				Total
	1	2	3	4	
Skilled	34	66	136	4	240
	23.6%	42.6%	26.6%	18.2%	29.0%
Semiprofessional	59	37	131	10	237
	41.0%	23.9%	25.6%	45.5%	28.0%
Students	28	14	86	4	132
	19.4%	9.0%	16.8%	18.2%	16.0%
Unskilled	6	27	60	2	95
	4.2%	17.4%	11.7%	9.1%	11.0%
Housewives	10	1	45	1	57
	6.9%	0.6%	8.8%	4.5%	7.0%
Professional	3	4	26	1	34
	2.1%	2.6%	5.1%	4.5%	4.0%
Semiskilled	2	4	16	0	22
	1.4%	2.6%	3.1%	0.0%	3.0%
Retired	2	1	10	0	13
	1.4%	0.6%	2.0%	0.0%	2.0%
Unemployed	0	1	2	0	3
	0.0%	0.6%	0.4%	0.0%	0.0%
<b>Total</b>	<b>144</b>	<b>155</b>	<b>512</b>	<b>22</b>	<b>833</b>
	<b>17.3%</b>	<b>18.6%</b>	<b>61.5%</b>	<b>2.6%</b>	<b>100%</b>

Table 5: Place of Accident

PLACE OF ACCIDENT	STATUS				Total
	1	2	3	4	
With in Bangalore	577	152	395	24	1148
	78.0%	88.9%	64.9%	85.7%	74.0%
Outside Bangalore	163	19	214	4	400
	22.0%	11.1%	35.1%	14.3%	26.0%
<b>Total</b>	<b>740</b>	<b>171</b>	<b>609</b>	<b>28</b>	<b>1548</b>
	<b>47.8%</b>	<b>11.0%</b>	<b>39.3%</b>	<b>1.8%</b>	<b>100%</b>

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Table 6: Road User Categories and Alcohol Status

CATEGORY OF ROAD USER	STATUS				Total
	1	2	3	4	
Two Wheeler Rider	287	95	172	12	566
	36.9%	52.8%	28.3%	35.3%	35.4%
Pedestrian	206	41	148	9	404
	26.5%	22.8%	24.3%	26.5%	25.3%
Two wheeler Occupant	34	9	48	3	94
	4.4%	5.0%	7.9%	8.8%	5.9%
Bus Passenger	33	0	54	0	87
	4.2%	0.0%	8.9%	0.0%	5.4%
Matador Passenger	23	2	34	0	59
	3.0%	1.1%	5.6%	0.0%	3.7%
Bicyclist	23	2	34	0	59
	3.0%	1.1%	5.6%	0.0%	3.7%
Autorikshaw passenger	38	4	10	0	52
	4.9%	2.2%	1.6%	0.0%	3.3%
Autorikshaw driver	23	10	15	0	48
	3.0%	5.6%	2.5%	0.0%	3.0%
Car Occupant	6	5	33	0	44
	0.8%	2.8%	5.4%	0.0%	2.8%
Car Driver	16	4	21	2	43
	2.1%	2.2%	3.5%	5.9%	2.7%
Not Known	34	0	2	6	42
	4.4%	0.0%	0.3%	17.6%	2.6%
Lorry Passenger	17	3	6	0	26
	2.2%	1.7%	1.0%	0.0%	1.6%
Matador Driver	4	0	9	1	14
	0.5%	0.0%	1.5%	2.9%	0.9%
Lorry Driver	9	2	2	0	13
	1.2%	1.1%	0.3%	0.0%	0.8%
Tractor Occupant	8	0	5	0	13
	1.0%	0.0%	0.8%	0.0%	0.8%
Others	6	2	4	1	13
	0.7%	1.1%	0.7%	2.9%	0.8%
Railway Passenger	3	0	4	0	7
	0.4%	0.0%	0.7%	0.0%	0.4%
Rider Animal drawn vehi	5	0	2	0	7
	0.6%	0.0%	0.3%	0.0%	0.4%
Bus Driver	2	1	4	0	7
	0.3%	0.6%	0.7%	0.0%	0.4%
Tractor Driver	1	0	0	0	1
	0.1%	0.0%	0.0%	0.0%	0.1%
Stationary Individual	0	0	1	0	1
	0.0%	0.0%	0.2%	0.0%	0.1%
<b>Total</b>	<b>778</b>	<b>180</b>	<b>608</b>	<b>34</b>	<b>1600</b>
	<b>48.6%</b>	<b>11.3%</b>	<b>38.0%</b>	<b>2.1%</b>	<b>100%</b>

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Table 7: Nature of Vehicles Colliding with Injured Person

N16HITBY	STATUS				Total
	1	2	3	4	
Lorry	104	14	93	3	214
	15.9%	11.5%	19.4%	11.1%	16.7%
Car	84	11	74	4	173
	12.8%	9.0%	15.4%	14.8%	13.5%
Motorbike	80	20	53	4	157
	12.2%	16.4%	11.0%	14.8%	12.2%
Bus	67	10	78	0	155
	10.2%	8.2%	16.3%	0.0%	12.1%
Scooter	56	9	43	2	110
	8.6%	7.4%	9.0%	7.4%	8.6%
Others	52	22	34	2	110
	8.0%	18.0%	7.1%	7.4%	8.6%
Matador	54	12	42	1	109
	8.3%	9.8%	8.8%	3.7%	8.5%
Not Known	65	17	10	9	101
	9.9%	13.9%	2.1%	33.3%	7.9%
Autorikshaw	68	2	26	1	97
	10.4%	1.6%	5.4%	3.7%	7.6%
Pedestrian	14	0	9	0	23
	2.1%	0.0%	1.9%	0.0%	1.8%
Moped	8	0	2	1	11
	1.2%	0.0%	0.4%	3.7%	0.9%
Bicycle	1	4	4	0	9
	0.2%	3.3%	0.8%	0.0%	0.7%
Tractor	1	1	7	0	9
	0.2%	0.8%	1.5%	0.0%	0.7%
Animal drawn vehi	0	0	5	0	5
	0.0%	0.0%	1.0%	0.0%	0.4%
<b>Total</b>	<b>654</b>	<b>122</b>	<b>480</b>	<b>27</b>	<b>1283</b>
	<b>51.0%</b>	<b>9.5%</b>	<b>37.4%</b>	<b>2.1%</b>	<b>100%</b>

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Table 8: Nature of Collision

COLLISION	STATUS				Total
	1	2	3	4	
Hit & Run	134	28	133	4	299
	17.5%	16.3%	22.0%	12.1%	19.0%
Head on	117	31	119	4	271
	15.3%	18.0%	19.7%	12.1%	17.0%
Skid	99	48	76	6	229
	12.9%	27.9%	12.6%	18.2%	15.0%
Not Known	178	16	10	11	215
	23.2%	9.3%	1.7%	33.3%	14.0%
Side Collision	68	12	68	2	150
	8.9%	7.0%	11.2%	6.1%	10.0%
Overturn	26	7	37	1	71
	3.4%	4.1%	6.1%	3.0%	5.0%
Hit Fixed Object	28	6	30	0	64
	3.7%	3.5%	5.0%	0.0%	4.0%
Nose to tail	23	0	35	3	61
	3.0%	0.0%	5.8%	9.1%	4.0%
Rear end Hit	34	3	21	2	60
	4.4%	1.7%	3.5%	6.1%	4.0%
Angle collision	15	7	27	0	49
	2.0%	4.1%	4.5%	0.0%	3.0%
Fall from Moving vehi	13	4	29	0	46
	1.7%	2.3%	4.8%	0.0%	3.0%
Others	29	8	8	0	45
	3.8%	4.7%	1.3%	0.0%	3.0%
Fall from Stationary vehi	2	1	6	0	9
	0.3%	0.6%	1.0%	0.0%	1.0%
Hit parked vehi	1	1	6	0	8
	0.1%	0.6%	1.0%	0.0%	1.0%
<b>Total</b>	<b>767</b>	<b>172</b>	<b>605</b>	<b>33</b>	<b>1577</b>
	<b>48.6%</b>	<b>10.9%</b>	<b>38.4%</b>	<b>2.1%</b>	<b>100%</b>

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Table 9: Place of Drinking Prior to Accident

N18PLACEDR	STATUS		Total
	1	2	
Bar	10	115	125
	31.3%	63.5%	58.7%
Not Known	17	39	56
	53.1%	21.5%	26.3%
Retail Store	4	15	19
	12.5%	8.3%	8.9%
Party	1	6	7
	3.1%	3.3%	3.3%
Home	0	2	2
	0.0%	1.1%	0.9%
Stored Item	0	2	2
	0.0%	1.1%	0.9%
Star Hotel	0	1	1
	0.0%	0.6%	0.5%
Not Available	0	1	1
	0.0%	0.6%	0.5%
Total	32	181	213
	15.0%	85.0%	100%

Table 10: Type of Alcoholic Drinks

Type of drink	STATUS	
	2	Total
Whisky	53	53
	29.1%	
Rum	40	40
	22.0%	
Not Known	38	38
	20.9%	
Beer	25	25
	13.7%	
Brandy	14	14
	7.7%	
Arrack	8	8
	4.4%	
Wine	4	4
	2.2%	
Total	182	182
	100.0%	

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Table 11: Amount of Drinking

Beer drinkers	Subjects	Percents
1 bottle	24	77.0
2 bottles	6	19.0
3 bottles	1	3.0
Total	31	100

WHISKY / RUM	Subjects	Percents
1 peg	2	2.0
2 Pegs	12	12.0
3 Pegs	43	42.0
4 Pegs	14	13.0
5 Pegs	8	8.0
6 Pegs	20	19.0
8 Pegs	1	1.0
9 pegs	4	4.0
Total	104	100

Arrack drinkers	Subjects	Percents
2 packets	3	50.0
3 packets	3	50.0
Total	6	100

Table 12: Time Interval between Alcohol Consumption and Injury

Time interval	Subjects	Percents
<1 hour	54	39
1-2 hours	46	33
2-3 hours	17	12
>3 hours	22	16
Total	139	100

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Table 13: Reasons for Drinking

Reasons	Subjects	Percents
Habbit	72	43.0
Pleasure	28	17.0
Party	25	15.0
Family problems	20	12.0
No reason	8	5.0
Miscellaneous	5	3.0
Addiction	4	2.0
Medical causes	4	2.0
Total	166	100

Table 14: Situation of Drinking

SITUATION	STATUS		Total
	1	2	
ALONE	8	68	76
	25.0%	37.4%	35.5%
WITH FRIENDS	6	65	71
	18.8%	35.7%	33.2%
NOT KNOWN	18	46	64
	56.3%	25.3%	30.0%
WITH COLLEAGUES	0	2	2
	0.0%	1.1%	0.9%
NOT AVAILABLE	0	1	1
	0.0%	0.5%	0.4%
Total	32	182	214
	15.0%	85.0%	100%

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Table 15: Confidence to Drive after Drinking

N24CONFIDE	STATUS	
	2	Total
YES	65	65
	35.7%	
NOT KNOWN	54	54
	29.7%	
CANT SAY	50	50
	27.5%	
NO	7	7
	3.8%	
NOT AVAILABLE	6	6
	3.3%	
Total	182	182
	100.0%	

Table 16: Availability of Prehospital & Emergency Care

CARE AFTER INJURY	STATUS				Total
	1	2	3	4	
NO	411	143	459	16	1029
	52.8%	79.9%	75.4%	51.6%	64.0%
NK	230	12	11	11	264
	29.6%	6.7%	1.8%	35.5%	17.0%
YES	72	22	132	3	229
	9.3%	12.3%	21.7%	9.7%	14.0%
CANT SAY	65	2	7	1	75
	8.4%	1.1%	1.1%	3.2%	5.0%
Total	778	179	609	31	1597
	48.7%	11.2%	38.1%	1.9%	100%

Table 17: Injury Reporting Status with Police

REPORTE TO POLICE	STATUS				Total
	1	2	3	4	
YES	379	122	400	27	928
	48.7%	67.8%	65.7%	84.4%	58.0%
NO	178	57	204	3	442
	22.9%	31.7%	33.5%	9.4%	28.0%
NK	221	1	5	2	229
	28.4%	0.6%	0.8%	6.3%	14.0%
Total	778	180	609	32	1599
	48.7%	11.3%	38.1%	2.0%	100%

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Table 18: Mode of Transportation

MODE OF TRANSPORT	STATUS				Total
	1	2	3	4	
Ambulance	120	40	220	6	386
	15.4%	22.2%	36.1%	18.2%	24.0%
Others	359	2	17	3	381
	46.1%	1.1%	2.8%	9.1%	24.0%
Autorikshaw	128	52	109	12	301
	16.5%	28.9%	17.9%	36.4%	19.0%
Private Vehicle	91	30	170	7	298
	11.7%	16.7%	27.9%	21.2%	19.0%
Hoysala	17	28	37	4	86
	2.2%	15.6%	6.1%	12.1%	5.0%
Public Vehicle	43	14	29	0	86
	5.5%	7.8%	4.8%	0.0%	5.0%
Own Vehicle	20	14	27	1	62
	2.6%	7.8%	4.4%	3.0%	4.0%
<b>Total</b>	<b>778</b>	<b>180</b>	<b>609</b>	<b>33</b>	<b>1600</b>
	<b>48.6%</b>	<b>11.3%</b>	<b>38.1%</b>	<b>2.1%</b>	<b>100%</b>

Table 19: Status at Hospital Entry

STATU OF ENTRY	STATUS				Total
	1	2	3	4	
CONSCIOUS	595	119	425	22	1161
	90.0%	69.2%	70.2%	68.8%	79.0%
UNCONSCIOUS	39	40	136	5	220
	5.9%	23.3%	22.5%	15.6%	15.0%
RESPONDS TO STIMILY	23	11	41	1	76
	3.5%	6.4%	6.8%	3.1%	5.0%
DEAD	4	2	3	4	13
	0.6%	1.2%	0.5%	12.5%	1.0%
<b>Total</b>	<b>661</b>	<b>172</b>	<b>605</b>	<b>32</b>	<b>1470</b>
	<b>45.0%</b>	<b>11.7%</b>	<b>41.2%</b>	<b>2.2%</b>	<b>100%</b>

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Status -

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Table 20: Observational Assessment of Alcohol Intoxication Levels by Y91 Codes

Y91CODE	Subjects	Percents
Severe	83	46.6
Very Severe	67	37.7
Moderate	24	13.5
Not specified	4	2.2
Mild	0	0.0
Total	162	100

Table 21: Nature of Injuries

NATURE INJURIES	STATUS				Total
	1	2	3	4	
Simple injuries	432	81	273	6	792
	57.8%	49.7%	45.2%	27.3%	52.0%
Head Injuries	133	50	214	8	405
	17.7%	30.6%	35.5%	36.3%	26.0%
Fractures	104	27	85	3	219
	13.9%	16.6%	14.1%	13.6%	14.0%
Other Injuries	79	5	32	5	121
	10.6%	3.1%	5.3%	22.7%	8.0%
Total	748	163	604	22	1537
	48.7%	10.6%	39.3%	1.4%	100%

Table 22: Mode of Management

MODE OF MANAGEMENT	STATUS				Total
	1	2	3	4	
Casualty management	351	94	288	9	742
	52.6%	51.6%	48.5%	34.6%	51.0%
Admission	266	54	259	7	586
	39.9%	29.7%	43.6%	26.9%	40.0%
Surgery	25	7	27	1	60
	3.7%	3.8%	4.5%	3.8%	4.0%
Others	15	23	4	7	49
	2.2%	12.6%	0.7%	26.9%	3.0%
ICU management	10	4	16	2	32
	1.5%	2.2%	2.7%	7.7%	2.0%
Total	667	182	594	26	1469
	45.4%	12.4%	40.4%	1.8%	100%

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Table 23: Outcome at ER Level among Road Traffic Injuries

OUTCOME	STATUS				Total
	1	2	3	4	
Good recovery	241	71	186	11	509
	43.1%	40.1%	31.6%	40.7%	38.0%
Moderate Disability	194	52	197	6	449
	34.7%	29.4%	33.5%	22.2%	33.0%
Severe disability	104	48	189	4	345
	18.6%	27.1%	32.1%	14.8%	26.0%
Death	17	4	8	6	35
	3.0%	2.3%	1.4%	22.2%	3.0%
PVS	3	2	8	0	13
	0.5%	1.1%	1.4%	0.0%	1.0%
Total	559	177	588	27	1351
	41.4%	13.1%	43.5%	2.0%	100%

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## **Annexure – II. ROADSIDE SURVEY**

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**Table 1: Vehicle Observation and Testing for Alcohol**

Phase I:	Total vehicles observed	3333
	Total drivers tested positive	215 (7%)
Phase II:	Total vehicles observed	1866
	Total drivers stopped	491 (26%)
	Total drivers tested positive	203 (41%)
	Total drivers tested negative	288 (59%)

**Table 2: Age Distribution of Tested Individuals**

AGE	SUSPICIOUS +VE	RANDOM ALCO+VE	RANDOM ALCO-VE	Total
15 to 19	1 0.5%	0 0.0%	4 1.4%	5 0.4%
20 to 24	17 7.9%	17 8.4%	52 18.1%	86 12.1%
25 to 29	52 24.2%	57 28.1%	89 30.9%	198 28.0%
30 to 34	42 19.5%	49 24.1%	62 21.5%	153 21.7%
35 to 39	42 19.5%	34 16.7%	42 14.6%	118 16.7%
40 to 44	28 13.0%	21 10.3%	27 9.4%	76 10.8%
45 to 49	17 7.9%	11 5.4%	7 2.4%	35 5.0%
50 to 54	12 5.6%	12 5.9%	4 1.4%	28 4.0%
55 to 59	3 1.4%	1 0.5%	0 0.0%	4 0.6%
60 +	1 0.5%	1 0.5%	1 0.3%	3 0.4%
Total	215 30.5%	203 28.8%	288 40.8%	706 100%

Table 3: Educational Status

EDUCATION	SUSPICIOUS +VE	RANDOM ALCO+VE	RANDOM ALCO-VE	Total
Illiterate	7 3.3%	15 7.4%	7 2.4%	29 4.1%
Primary	6 2.8%	1 0.5%	3 1.0%	10 1.4%
Secondary	6 2.8%	13 6.4%	19 6.6%	38 5.4%
High school	58 27.0%	50 24.6%	114 39.6%	222 31.4%
PUC	18 8.4%	17 8.4%	32 11.1%	67 9.5%
Vocational	12 5.6%	15 7.4%	20 6.9%	47 6.7%
Graduate	49 22.8%	71 35.0%	79 27.4%	199 28.2%
PG	17 7.9%	13 6.4%	6 2.1%	36 5.1%
Professnl.	3 1.4%	7 3.4%	5 1.7%	15 2.1%
NK	39 18.1%	1 0.5%	3 1.0%	43 6.1%
Total	215 30.5%	203 28.8%	288 40.8%	706 100%

Table 4: Occupational Category

OCCUPATION	SUSPICIOUS +VE	RANDOM ALCO+VE	RANDOM ALCO-VE	Total
Skilled	82 38.1%	96 47.3%	140 48.6%	318 45.0%
Semi Prof.	54 25.1%	55 27.1%	76 26.4%	185 26.2%
NK	44 20.5%	7 3.4%	15 5.2%	66 9.3%
Professional	10 4.7%	24 11.8%	20 6.9%	54 7.6%
Semiskilled	7 3.3%	11 5.4%	17 5.9%	35 5.0%
Unskilled	8 3.7%	3 1.5%	6 2.1%	17 2.4%
Others	7 3.3%	5 2.5%	3 1.0%	15 2.1%
Housewives	2 0.9%	0 0.0%	8 2.8%	10 1.4%
Unemployed	1 0.5%	1 0.5%	2 0.7%	4 0.6%
Retired	0 0.0%	1 0.5%	1 0.3%	2 0.3%
Total	215 30.5%	203 28.8%	288 40.8%	706 100%

Table 5: Road User Categories

CATEGORY	SUSPICIOUS +VE	RANDOM ALCO+VE	RANDOM ALCO-VE	Total
Rider & Pillion	158	161	209	528
	73.5%	79.3%	72.6%	74.8%
Bus Drivers	27	24	16	67
	12.6%	11.8%	5.6%	9.5%
Matador Drivers	7	7	50	64
	3.3%	3.4%	17.4%	9.1%
Matador driver	7	6	8	21
	3.3%	3.0%	2.8%	3.0%
Pedestrian	11	2	0	13
	5.1%	1.0%	0.0%	1.8%
Lorry driver	3	3	4	10
	1.4%	1.5%	1.4%	1.4%
Lorry Passenger	1	0	0	1
	0.5%	0.0%	0.0%	0.1%
Car Driver	1	0	0	1
	0.5%	0.0%	0.0%	0.1%
Auto Driver	0	0	1	1
	0.0%	0.0%	0.3%	0.1%
Total	215	203	288	706
	30.5%	28.8%	40.8%	100%

Table 6: Alcohol Observational Assessments

Y90CODES	SUSPICIOUS +VE	RANDOM ALCO+VE	RANDOM ALCO-VE	Total
Y90.0	12	19	2	33
<20ml	5.6%	9.5%	50.0%	7.9%
Y90.1	34	36	1	71
20-39	15.8%	18.1%	25.0%	17.0%
Y90.2	44	31	0	75
40-59	20.5%	15.6%	0.0%	17.9%
Y90.3	24	27	0	51
60-79	11.2%	13.6%	0.0%	12.2%
Y90.4	25	23	0	48
80-99	11.6%	11.6%	0.0%	11.5%
Y90.5	16	19	0	35
100-119	7.4%	9.5%	0.0%	8.4%
Y90.6	37	40	1	78
120-199	17.2%	20.1%	25.0%	18.7%
Y90.7	10	1	0	11
200-239	4.7%	0.5%	0.0%	2.6%
Y90.8	13	3	0	16
>240	6.0%	1.5%	0.0%	3.8%
Total	215	199	4	418
	51.4%	47.6%	1.0%	100%

Table 7: Type of Alcoholic Beverages

DRINK TYPE	SUSPICIOUS +VE	RANDOM ALCO+VE	RANDOM ALCO-VE	Total
Beer	112	108	0	220
	52.1%	54.5%	0.0%	52.8%
Whisky	63	58	1	122
	29.3%	29.3%	25.0%	29.3%
Rum	25	20	0	45
	11.6%	10.1%	0.0%	10.8%
Brandy	10	4	0	14
	4.7%	2.0%	0.0%	3.4%
Not Known	3	7	3	13
	1.4%	3.5%	75.0%	3.1%
Arrack	2	1	0	3
	0.9%	0.5%	0.0%	0.7%
Total	215	198	4	417
	51.6%	47.5%	1.0%	100%

Table 8: Quantity of Consumption

BOTTLES	SUSPICIOUS +VE	RANDOM ALCO+VE	Total
1 Bottle	97	95	192
	72.9%	84.8%	78.4%
2 Bottles	34	17	51
	25.6%	15.2%	20.8%
3 Bottles	2	0	2
	1.5%	0.0%	0.8%
Total	133	112	245
	54.3%	45.7%	100%

PEGS	SUSPICIOUS +VE	RANDOM ALCO+VE	RANDOM ALCO-VE	Total
1 Peg	7	5	0	12
	9.2%	6.3%	0.0%	
2 Pegs	21	10	0	31
	27.6%	12.5%	0.0%	
3 Pegs	30	44	0	74
	39.5%	55.0%	0.0%	
4 Pegs	7	14	0	21
	9.2%	17.5%	0.0%	
5 Pegs	0	4	0	4
	0.0%	5.0%	0.0%	
6 Pegs	11	2	1	14
	14.5%	2.5%	100.0%	
7 Pegs	0	1	0	1
	0.0%	1.3%	0.0%	
Total	76	80	1	157
	48.4%	51.0%	0.6%	

Table 9: Place of Drinking

PLACE OF DRINKING	1SUSPICIOUS+VE	2RANDOM ALCO+VE	3RANDOM ALCO-VE	Total
Bar	141 65.9%	134 70.2%	1 100.0%	276 68.9%
Party	35 16.4%	32 16.8%	0 0.0%	67 16.5%
Home	28 13.1%	23 12.0%	0 0.0%	51 12.6%
5-Star hotel	3 1.4%	2 1.0%	0 0.0%	5 1.2%
Retail store	4 1.9%	0 0.0%	0 0.0%	4 1.0%
Stored item	2 0.9%	0 0.0%	0 0.0%	2 0.5%
NK	1 0.5%	0 0.0%	0 0.0%	1 0.2%
Total	214 52.7%	191 47.0%	1 0.2%	406 100%

Table 10: Situation of Drinking

SITUATION	SUSPICIOUS +VE	RANDOM ALCO+VE	RANDOM ALCO-VE	Total
Friends	118 55.4%	69 35.6%	3 100.0%	190 46.3%
Alone	81 38.0%	80 41.2%	0 0.0%	161 39.3%
Not Known	11 5.2%	45 23.2%	0 0.0%	56 13.7%
Colleagues	3 1.4%	0 0.0%	0 0.0%	3 0.7%
Total	213 52.0%	194 47.3%	3 0.7%	410 100%

Table 11: Confident to Drive after Drinking

CONFIDENT	SUSPICIOUS +VE	RANDOM ALCO+VE	RANDOM ALCO-VE	Total
YES	206 97.2%	191 99.5%	3 100.0%	400 98.3%
NO	5 2.4%	0 0.0%	0 0.0%	5 1.2%
CONT SAY	1 0.5%	1 0.5%	0 0.0%	2 0.5%
Total	212 52.1%	192 47.2%	3 0.7%	407 100%

Table 12: Drinking & Driving not Permitted by Law

DD IS NOT PERMITTED	SUSPICIOUS +VE	RANDOM ALCO+VE	RANDOM ALCO-VE	Total
KNOWN	207 96.3%	187 94.9%	162 100.0%	556 96.9%
NOT KNOWN	8 3.7%	10 5.1%	0 0.0%	18 3.1%
Total	215 37.5%	197 34.3%	162 28.2%	574 100%

Table 13: Knowledge about Penalty Levels after Drinking

PENALTY	SUSPICIOUS +VE	RANDOM ALCO+VE	RANDOM ALCO-VE	Total
NO	213 99.1%	186 92.1%	281 97.9%	680 96.6%
YES	2 0.9%	16 7.9%	6 2.1%	24 3.4%
Total	215 30.5%	202 28.7%	287 40.8%	704 100%



Table 14: Alcohol Observational Assessments

DD IS DANGEROUS	SUSPICIOUS +VE	RANDOM ALCO+VE	RANDOM ALCO-VE	Total
YES	214	196	162	572
	100.0%	99.5%	100.0%	99.8%
NO	0	1	0	1
	0.0%	0.5%	0.0%	0.2%
Total	214	197	162	573
	37.3%	34.4%	28.3%	100%

Table 15: Family Awareness about Drivers Drinking Habits

FAMILY KNOWS ABOUT DRINKING	SUSPICIOUS +VE	RANDOM ALCO+VE	RANDOM ALCO-VE	Total
NO	65	53	201	319
	30.4%	27.0%	91.4%	50.6%
YES	149	143	19	311
	69.6%	73.0%	8.6%	49.4%
Total	214	196	220	630
	34.0%	31.1%	34.9%	100%

# Annexure – III. Availability and Rise in Consumption

Fig 1: Rise in Beverage Alcohol Production in Karnataka from 1988 -1999

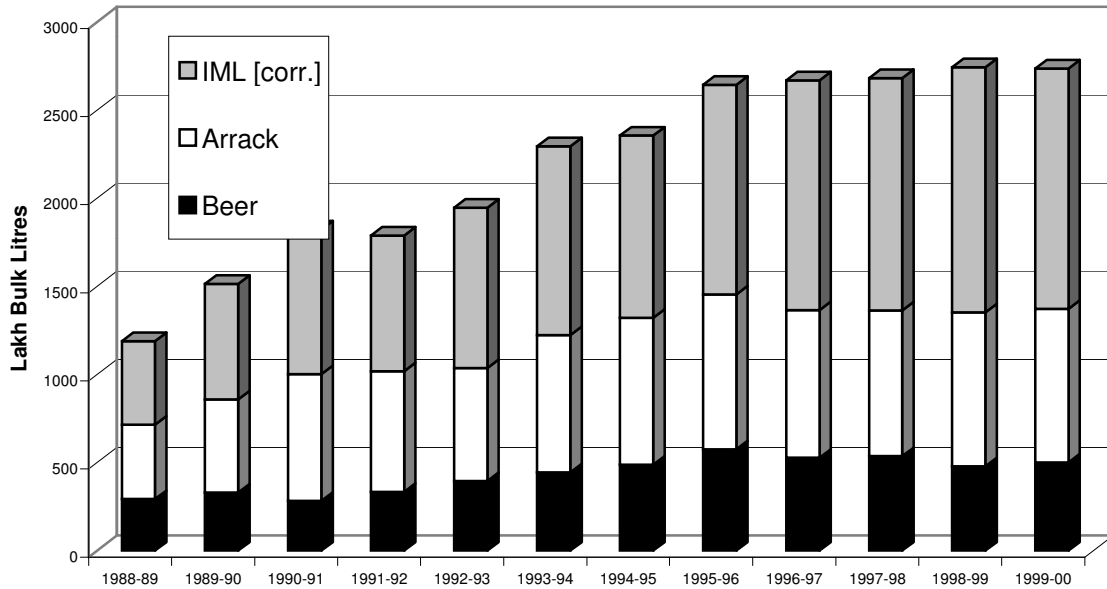
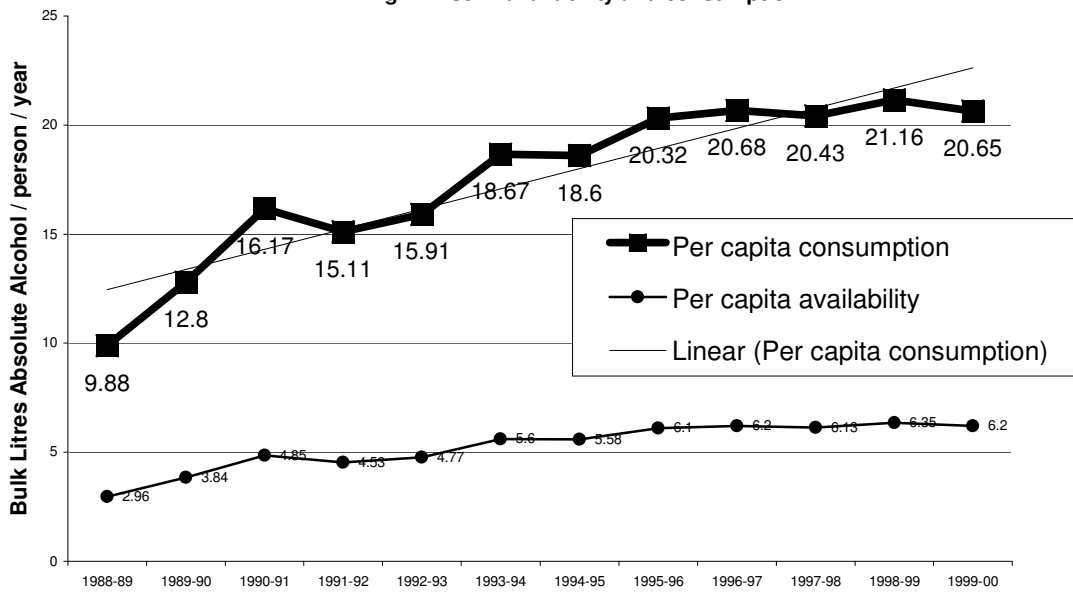


Fig 2: Rise in availability and consumption



**Annexure – IV. Roadside Breath Alcohol Checking by Police**



