Alcohol Control and its Impediment: A multi-sectoral issue

A dissertation submitted in partial fulfillment of the requirements for the award of

Post-Graduate Diploma in Health and Hospital Management

By

Jagjyot Kaur

PG/011/035

International Institute of Health Management Research

New Delhi -110075

May, 2013

Certificate of Internship Completion

Date: May 21, 2013

TO WHOM IT MAY CONCERN

This is to certify that Ms. Jagjyot Kaur has successfully completed her 3 months internship in our organization from February 6, 2013 to May 6, 2013. During her internship, she has worked on **Epidemiological Research for prevention and control of alcohol misuse in India** in consultation with Members of alcohol control team.

We wish her good luck for her future assignments

Dr. Monika Arora
PhD, MSc (Public Health), MSc (Child Development)
Director: Health Promotion
&
Adjunct Assistant Professor
Public Health Foundation of India
PHD House, Second Floor, 4/2, Siri Fort Institutional Area
August Kranti Marg, New Delhi - 110 016, India
Phone:+91-11-46046012(D), 46046000 Ext#105
Fax:-91-11-41648513, E-mail: monika.arora@phfi.org

FEEDBACK FORM

Name of the Student: **Jagjyot Kaur**

Dissertation Organization: **Public Health Foundation of India, New Delhi**

Area of Dissertation: **Epidemiological Research for Centre for Excellence-Alcohol Control project**

Attendance: **100 percent**

Objectives achieved: **Yes.**

Deliverables:

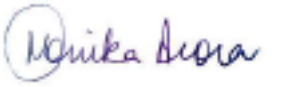
i) Completed dissertation thesis on **Alcohol Control and its Impediment: A Multi-sectoral issue**
ii) Desk review on Policies, Parliamentary procedures, Research on Alcohol harms and consequences and strategies to counter these harms.
iii) Article on 'Alcohol Use in Urban women' & 'Drink-Driving policies in India'.
iv) Developed Quantitative questionnaire to assess alcohol use among Indian population based on literature review.
v) Participated extensively to organize a two day FAS-National workshop on Alcohol taxation on April 22-23, 2013, New Delhi. Approximately 75 representatives from the government (excise commissioners from states of India), World Health Organization (WHO), academia, civil society organizations and researchers from India were contacted to participate in the workshop. Technical contributions made in developing workshop kit containing factsheets, CoE brochure, research papers and background material.

Strengths:

- Good work spirit and any time bound job can be given to her.
- Good Team member and enthusiastic towards work assignments.
- Punctual and hardworking & good co-ordination skills.

Suggestions for Improvement:

- She has potential to produce high quality research papers and needs to strengthen her research skills.



Dr. Monika Arora
PhD, MSc (Public Health), MSc (Child Development)
Director: Health Promotion
&
Adjunct Assistant Professor
Public Health Foundation of India
PHD House, Second Floor, 4/2, Sirifort Institutional Area
August Kranti Marg, New Delhi - 110 016, India
Phone:+91-11-46046012(D), 46046000 Ext#105
Fax:+91-11-41648513, E-mail: monika.arora@phfi.org

Date:
Place:

Acknowledgement

I would like to express my sincerest thanks and gratitude to **Dr. Monika Arora**, Director, Health Promotion Unit, Public Health Foundation of India New Delhi under whom I did my Internship, for her constant guidance, encouragement, support and moral boost which helped me in completing and carrying out this report successfully.

I am highly grateful to **Ms Deepti Singh**, Project Manager of the project on establishing Centre of Excellence for Alcohol Control (CoE-AC) at Health and promotion Unit of PHFI. She was kind enough to spare her valuable time for helping me out complete my work. Sincere thanks to **Ms Kavita Chauhan (Officer, Health Promotion Unit)**, **Mr Raghavendra Madhu (Research Officer)** and team members of PHFI, New Delhi for giving their valuable time and suggestions which helped me in completion of the project on time.

I would like to thank **Dr. Vinay Tripathi**, my mentor for providing me with academic and practical insight into my work without which, this report would not have been completed.

With Best Wishes

Jagjyot Kaur

PGDHHM

International Institute of Health Management Research (IIHMR)

New Delhi

Certificate from Dissertation Advisory Committee

This is to certify that **Ms. Jagjyot Kaur**, a graduate student of the **Post-Graduate Diploma in Health and Hospital Management** has worked under our guidance and supervision. She is submitting this dissertation titled "Alcohol Misuse and its Impediment: A Multi-sectoral issue" in partial fulfillment of the requirements for the award of the **Post- Graduate Diploma in Health and Hospital Management.**

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.

Deepti Singh

Dr. Vinay Tripathi
Assistant Professor
IIHMR
New Delhi

Ms Deepti Singh
Project Manager
CoE-AC
PHFI
New Delhi

Date: 21st May, 2013

Certificate of Approval

The following dissertation titled "**Alcohol Control and its impediment: A multi-sectoral issue**" is hereby approved as a certified study in management carried out and presented in a manner satisfactory to warrant its acceptance as a prerequisite for the award of Post-Graduate Diploma in Health and Hospital Management for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation

Name	Signature
Dr. Vinay Tripathi	
Dr. Dharmesh Lal	
Dr. Nitish Dogra	
Vanishree M R	

FEEDBACK FORM

Name of the Student: [illegible]

Dissertation Organization: Public Health Foundation of India, New Delhi

Area of Dissertation: [illegible]

Attendance: [illegible]

Objectives achieved: Yes

Deliverables:

i) [illegible]
ii) [illegible]
iii) [illegible]
iv) [illegible]
v) [illegible]

Strengths:

- [illegible]
- [illegible]
- [illegible]

Suggestions for Improvement:

- [illegible]

[illegible]

Date:
Place:

TABLE OF CONTENTS

TOPIC	PAGE NO.
1.Internship Report	2-6
2. Dissertation Report	7-55
2.1 Introduction	9
2.2 Objectives	10
2.3 Methodology	11
2.4 Status of Alcohol consumption, production and trends	12-17
2.5 Socio-Demographic analysis and patterns	17-25
2.6 Health consequences of drinking	26-30
2.7 Social consequences of drinking	31-35
2.8 Economic costs of alcohol consumption	36-37
2.9 Interventions taken to control alcohol consumption in India	38-46
3.0 Recommendations	47-49
4.0 References	50-55

1.Internship Report

About Public Health Foundation of India

The Public Health Foundation of India was conceptualized as a response to emerging public health challenges in India. In the inception of this unique public private partnership lies recognition that meeting the shortfall of health professionals is imperative for a sustained and holistic response to India's public health challenges. The foundation of our endeavors is the belief that healthcare in India ought to be addressed not only from the scientific perspective of what works, but also from the social perspective of who needs it the most, and that health system performance needs to be assessed on the attribute of access, affordability, adequacy, appropriateness, efficiency, cost-effectiveness and equity. PHFI was launched on March 28, 2006 by the Honorable Prime Minister of India, Dr. Manmohan Singh at New Delhi, to strengthen public health capacities in the country. It is a public private partnership, with initial funding from the Ministry of Health and Family Welfare (Govt. of India), the Bill and Melinda Gates Foundation and notable Indian philanthropists such as Mukesh Ambani and Narayan Murthy. Structured as an autonomously governed society, PHFI is led by a governing Council comprising senior Government officials, eminent Indian and International academic scientific leaders, civil society representatives and industry leaders. The Public Health Foundation of India was conceptualized as a response to emerging public health challenges in India. The concept enjoys wide support nationally and internationally. Working closely with the central and state governments across five continents, PHFI is working towards education, training, research, policy and advocacy efforts and communication, cutting across major disciplines of public health. Many initiatives at the organization have been strengthened by strong links and support from government agencies in policies and programmes alike. With the Ministry of Health and Family Welfare as the nodal agency; state governments, the Prime Minister's office have also been seconded to engage and work collaboratively with the PHFI team to develop solutions for the health sector. PHFI partners with the World Bank, WHO, United Nations agencies, national and international NGOs and 65 schools of Public Health from around the world. Strong ties have been done with crucial national institutes like the Planning Commission, the ICMR, the National Health Systems Resource Centre, National Commission for protection of Child Rights, the Indian

National Science Academy, the National Human rights commission, and the Ministry of Science and Technology. Forthcoming partnerships include the Ministry of Environment and Forests and the Council of Scientific and Industrial Research. Programmes for promoting employee health and wellness are being developed and initiated with the organised sector.

Achievements:

The first four IIPHs in Delhi, Gandhinagar, Hyderabad and Bhubaneshwar are fully functional and multiple post-graduate diploma programs, short term trainings, and research projects have been initiated. MoU for establishment of IIPH has been signed with the Government of Meghalaya. Discussions are in the advanced stages with the Governments of Tamil Nadu, Kerala, Uttarakhand, West Bengal and Punjab for establishment of other IIPHs.

Academic Programmes:

Postgraduate Diploma in Public Health Management;

Postgraduate Diploma in Health Economics, Health Policy and Health care Financing;

Postgraduate Diploma in Bio-statistics and Data management;

Postgraduate Diploma in Clinical Research on campus and in distance learning mode;

Postgraduate Diploma in Epidemiology in distance learning mode;

Postgraduate Diploma in Public health Nutrition in distance learning mode;

Postgraduate Diploma in Health Promotion in distance learning mode;

The public Health Foundation of India has been appointed as the Secretariat by the Planning Commission of India, to provide technical and logistical support to the High Level Expert Group in preparing its report.

Major Grants Received:

- Partnership for sustained Impact- NACO Capacity Building Grant: The Bill and Melinda Gates Foundation awarded $18 million to PHFI for providing technical assistance and capacity building support to the efforts of the National AIDS Control Organization (NACO) under the NACP III.
- Wellcome Trust Capacity Building Grant: the Wellcome Trust, UK has awarded £ 5 million to PHFI for capacity building of future faculty and kick-starting a quality research environment in India. This grant will support the training of 16

MPH, 27 PhD and 35 post-doctoral candidates (under the PHFI future faculty Programme) at partner schools in the UK and offer 23 seed research grants to IIPHs.

- Strengthening of Tobacco control Efforts through innovative partnerships and Strategies (STEPS): is a three-year project being implemented by PHFI and funded by $5.3 million grant from the Bill & Melinda gates Foundation.
- Assessing and supporting Norway India partnership Initiative (NIPI) Interventions: the Norwegian ministry of Foreign Affairs has awarded PHFI a grant of $724,000 for assessing and supporting NIPI interventions in India. The study is designed to use a multi-disciplinary approach in order to assess current interventions through a gender and equity lens in the states of Rajasthan and Orissa.
- Assessment of HIV Incidence and its Determinants in a population based Longitudinal Cohort Study in India: awarded to PHFI by centre Hospitalier Affilie Universitaire de Quebec (CHAUQ) (National Institutes of Health) for $716,115).
- Developing Case Studies for innovations in Public Health for Competency Strengthening and Advocacy- $500,000 grant awarded to PHFI by the MacArthur Foundation: the overall goal of the project is to strengthen institutional capacity towards accelerating decline in maternal mortality ratio and overtime, to sustain a very low maternal mortality regime through appropriate technical, programmatic and organizational responses.

1.1 **Dissertation Project Brief:** The project for Alcohol control at PHFI aims to undertake research and advocacy activities during 2013 and promote collaboration between researchers in India and Sweden. This project is a step towards exploring formation of a Centre of Excellence in Alcohol Control (CoE-AC) at PHFI. The center CoE-AC led by the PHFI will be linked with government, academia, civil society and will engage key stakeholders group as well as foster strategic partnerships with other organizations which have extensive experience and expansive outreach in community based health programs

and health advocacy. CoE-AC will strengthen research, capacity building, advocacy and policies around alcohol control in India. The CoE-AC would identify priorities in alcohol control for India and recognize equal partnerships between the host organization PHFI and SNIPH to seek solutions towards public health agenda for coherent action to achieve the policy's objective of promoting equitable and sustainable global development.

1.2 Statement of Duties:

As a research Associate, my major responsibilities include:

- Research support in conducting health and policy research, advocacy and evaluation of CoE-AC activities.
- Development of monitoring tool.
- Collation and analysis of press clippings.
- Review relevant literature and develop factsheet and information material.
- Co-ordinate the arrangement of workshops, meetings and other activities as and when required in CoE-AC.
- Assist in day to day operation, NGO and Government Co-ordination of project activities.

Dissertation on

Alcohol Control and its Impediment: A Multi-sectoral issue

Introduction

Alcoholism, tobacco addiction and overconsumption of food are choice-related illnesses. These are not only confined to developed nations but are also observed amongst numerous developing countries. Alcohol embraces the majority of global addictive demand and its per capita consumption is increasing rapidly. The fastest growth has been observed amongst the developing countries in the Asian sub-continent where per capita pure alcohol consumption has increased by over 50% between 1980 and 2000 and its corresponding share in the global burden of deaths has also increased with both alcohol and tobacco consumption being represented in the top ten causes of deaths worldwide. The harms from alcohol have been initiated to be logically documented. But there is lack of direction and focus as the efforts to tackle the problem are fragmented in India. The word alcohol has different meanings to people in different situations. For the government, it is the principle source of revenue; to a public health specialist, it is a major cause of death and injuries; for economists, it is just another product; to the common man, it is a pleasurable commodity and for the media, everything about alcohol is yet another story. A comprehensive examination of all issues related to alcohol is crucial to formulate a rational alcohol control policy and implement appropriate interventions in India. This review focuses on multidimensional aspects of alcohol ranging from its production, availability and sale; consumption patterns; health consequences; socioeconomic impact and efforts towards control and prevention of harm (Rahman, 2003).

Alcohol consumption is one of the most significant risks to health. Globally, alcohol is responsible for 3.8% of all deaths (harmful use of alcohol results in approximately 2.5 million deaths each year), greater than deaths caused by HIV/AIDS, violence or tuberculosis and 4.5% of the burden of injury and disease as measured in disability-adjusted life years (DALYs) lost. Alcohol is also associated with many serious social issues, including violence, child neglect and abuse, and absenteeism in the workplace. It is the third largest contributing factor to injury and disease worldwide, almost equal to tobacco, and in developing countries with overall low mortality, it is now the leading factor (Hill L, Clarke D, Casswell S. 2011).

While overall consumption levels are leveling off in some countries with mature alcohol markets, there are increased levels in others. Patterns of drinking are changing. Heavier drinking

occasions, particularly by young people, tend to lead to harm and have increased in many countries (Australian Bureau of Statistics 2006; Habgood et al. 2001; Milne 2003). The low proportion of drinkers in some countries and communities masks a tendency for those who do drink to drink large amounts per occasion (Huakau et al. 2004; Secretariat of the Pacific Community 2004, 2005).

The harmful use of alcohol is a particularly grave threat to men. It is the leading risk factor for death in males ages 15–59, mainly due to injuries, violence and cardiovascular diseases. Globally, 6.2% of all male deaths are attributable to alcohol, compared to 1.1% of female deaths. Men also have far greater rates of total burden attributed to alcohol than women – 7.4% for men compared to 1.4% for women. Men outnumber women four to one in weekly episodes of heavy drinking – most probably the reason for their higher death and disability rates. Men also have much lower rates of abstinence compared to women. Lower socioeconomic status and educational levels result in a greater risk of alcohol-related death, disease and injury – a social determinant that is greater for men than women (Hill L, Clarke D, Casswell S. 2011).

Data from NFHS 2 and 3, Ray 2004 and WHO 2004 show increasing consumption of alcohol and its accompanying harmful effects across all sections of Indian society especially emerging among women and youth. It is spreading out to more transitional, peri-urban and rural areas, and amazingly, a greater acceptance has been observed of drinking by Indian families. The perception of alcohol consumption and enhancement of social status among people of different socioeconomic backgrounds has been observed. So we can conclude that the current scenario in India has been a cumulative effect of several factors. These include easy availability of alcohol, liberalized values of society, and aggressive marketing strategies by the alcohol industry through print and visual media, shortsighted economic benefit perspective of Governments, lack of research in the areas of alcohol prevalence and control and the absence of a comprehensive alcohol control policy at central level. In addition to this, there is lack of coordination between several concerned ministries. (Pal et al, 2000). The constitution of India states that “the state shall endeavor to bring about prohibition of the consumption of intoxicating drinks”. Nearly six decades since this was enunciated, the task appears near impossible and no remedy seems to be in immediate sight (Government of India, 2004). Policy changes and media reports help us in

getting awareness of the problem of alcohol misuse. But it needs to be noted that alcohol is a state's subject and it is in state's control to produce, distribute, decide taxation, legislation and promotion. It is thus important to examine various issues related directly or indirectly to alcohol use. We have to Consider and review past experiences of control measure in India while formulating policies for alcohol control (NIMHANS, 2011). In this context, the present study has been done to comprehensively observe the multidimensionality of alcohol from production to minimizing harm from alcohol.

Objectives

The study has been done to bring together available information on the different dimensions of alcohol use (production, consumption) and its consequences (health related and other) in India, along with previous policy responses, in order to guide and support future rational and scientific policies. The specific objectives are:

1. To review the current status of alcohol consumption, production, and distribution influencing alcohol availability and accessibility.
2. To study and analyze the existing literature on drinking patterns, trends, practices and socio demographic analysis of alcohol use.
3. To study the health, social and economic impact of alcohol on individuals, families and overall societies.
4. Interventions taken to control alcohol consumption in India.
5. Future recommendations for reducing alcohol usage.

Methodology

The study is based on secondary sources of data and no primary data collection was undertaken. Literature was collected from different Indian and International journals and literature. The study was undertaken with the following keywords: alcohol, production, distribution, taxation, consumption, socio-economic status, regional distribution, drinking patterns, consequences, health effects, social effects, and policy and intervention program. Various databases like Pubmed, Google Scholar and others were used in research. Newspaper articles and electronic media reports were accessed using the general Google search engine.

Limitations:

There have been very few studies examining the macro- level impact of alcohol production and distribution and linking the same to health and well being of people. There is no single centralized agency in India that collects compiles and disseminates information on multi-dimensional aspects of alcohol. With regard to production and sales, individual state excise departments are the major source of information. Information on social consequences, policy formulation and impact are extremely limited. There is no systematic review of supply-demand-impact issues in India.

Status of Alcohol consumption and production:

The actual consumption of alcoholic beverages in India is difficult to estimate since a large part of the consumption also comprises of undocumented alcoholic beverages. Benegal et al (2003) estimated the recorded per capita consumption in India to be about 2 liters absolute alcohol equivalent/adult /year (calculated from official 2003 sales and population figures). Adjusting for undocumented consumption (illicit beverages as well as tax evaded products), the real per capita adult consumption is estimated to be nearly 4 litres absolute alcohol equivalent/adult/year**.** Estimates of undocumented consumption are not available officially, two prevalence studies from the north and the south of the country, almost twenty years apart, have consistently estimated it around 45%-50% of the total consumption (Singh,1986 and Benegal et al, 2003). There is also a considerable volume of smuggling of alcoholic beverages, especially Scotch and whisky into the country because of liberalization of imports. Another problem is the smuggling within the country and between the states. As alcohol production, sales and its taxation are state subjects, each state has different laws. Import and export duties result in high cost for interstate movements. This has resulted in each state behaving like a separate market, which has proved to be an incentive for large scale smuggling of alcoholic beverages across the borders. At least until the 1950's, most of this illicit liquor, appears to have been manufactured in small distilleries, often run by traditional manufacturers and hereditary toddy tappers, generally located in villages within easy reach of the cities. But as demand rose in the nineteen eighties and nineties, rivals from a number of other social groups also took up small-scale production.

Production of alcohol:

Alcohol in India is produced from sugarcane molasses which is used for both potable and industrial purposes. The basic ingredient in the manufacture of non- premium IMFL and arrack is rectified spirit manufactured from molasses. Despite of the fact that India has dry or abstaining culture, it has one of the largest beverage alcohol industries in the world. India is the dominant producer of alcohol in South Asia (65%) and contributes to about 7% of total alcohol beverage imports into the region. total beverage consumption in India exceeds two third of the production, thus making it one of the alcohol hotspots in the global market.

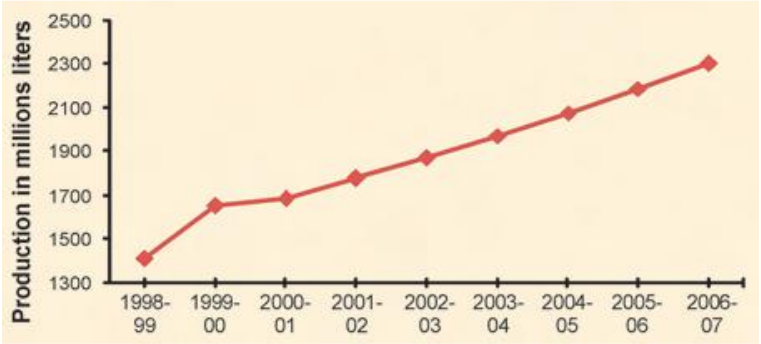
The planning Commission of India (2003) noted that in the 10th 5 year plan, there had been a steady increase in the production of alcohol, with the production doubling from 887.2 million litres in 1992-93 to 1654 million litres in 1999-2000 and 2300 million litres in 2006-2007. While precise estimates of production are not available, recent data from FAO reveal a 175% increase over a 15 year period (1990-92 to 2005-07).

Table-1 Alcohol Production and Import (metric tons)

	Production	**Import**
World	231035679	17876448
Asia	55981448 (24%)	1445338 (8.1%)
South East Asia	6411451 (11%)	105116 (7%)
India	4186853 (65%)	6876 (7%)
Thailand	1577180 (25%)	56579 (53%)

Source: FAO, 2001

Figure-1 Alcohol production in India



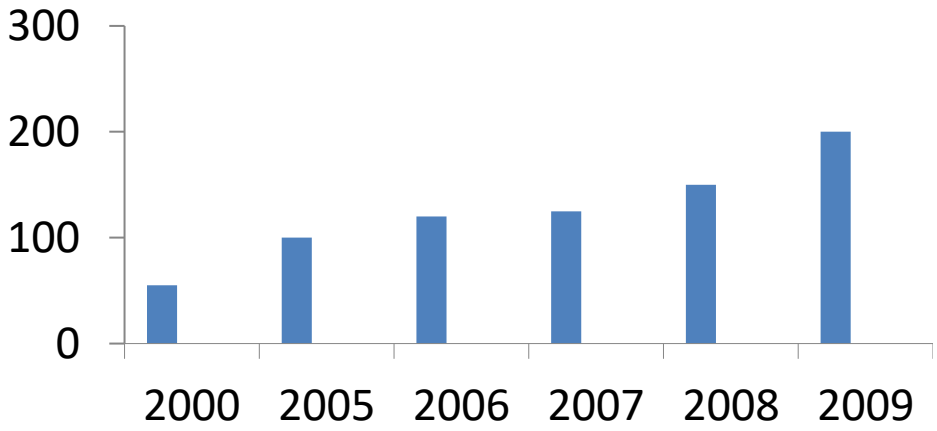
Source: Planning Commission of India, 2003

Trends of alcohol consumption in India

Alcohol use in India has seen a firm growth rate of 10 to 15% during the past decade with greater expansion seen in southern parts of India (Benegal, 2005). Several changes which have been observed in recent years are:

- Age of beginning of alcohol consumption has decreased from 28 years to about 18 years during the period 1980-2010,
- There is high consumption in areas with increased economic growth,
- Increase in quantity of alcohol consumed, (**Figure 2** depicts the increase in Sale of alcohol in India))
- An upward shift in rates of drinking among urban middle and upper social economic groups,
- Changing role of women and increasing consumption and,
- Increase in the use of beer, white spirits and wine (Gururaj et al, 2006)

Figure 2: Changing pattern of alcohol sales in India, 2000-2009

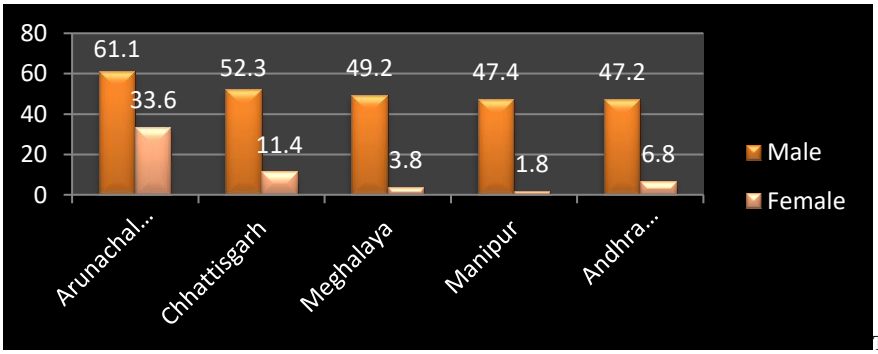


Source: IWSR, 2010

National scenario and estimates

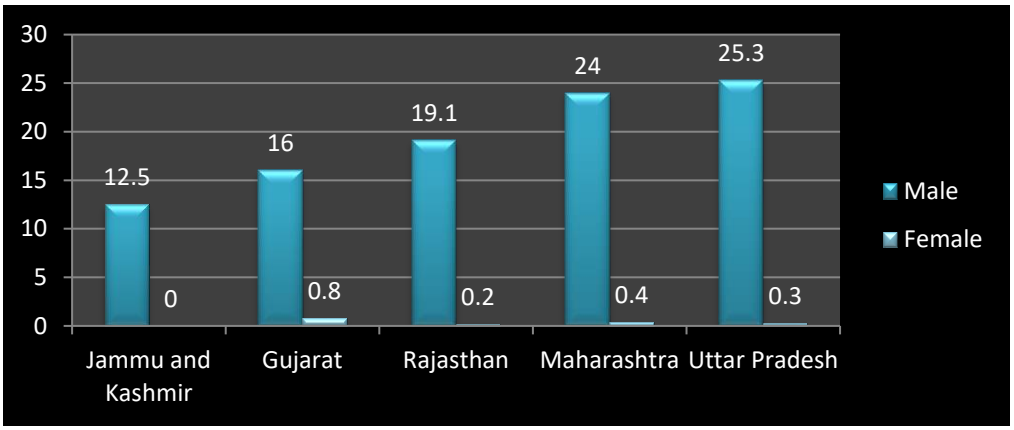
The National Household Survey of Drug Use (Ray, 2004) recorded alcohol use in 21.4% of adult males. This study was undertaken on a nationally representative sample of 40,697 adult males in

the age group of 12 to 60 years across 24 states by a two stage probability proportional to size sampling method. The survey reported an estimated 62 million adult male alcohol users in the country for the year 2001. A highest level of alcohol use was seen in the north eastern and northern parts of India. The prevalence of current use of alcohol ranged from as low as 7% in the western state of Gujarat (officially under Prohibition) to 75% in the Northeastern state of Arunachal Pradesh (NFHS-3, 2005-06). Data from treatment centers revealed that alcohol represented the primary drug of abuse accounting for 44% of help seeking in different treatment centers. Alcohol abuse was high among adolescents and youth and increasing among rural population across all centers. According to the World Health Survey covering a total population of 9540 individuals aged 18 years and above, the rate of heavy and hazardous drinking was 1.4% varying between 2.4% to 0.4% among men and women, respectively. The rate of heavy episodic drinking, defined as consumption of five standard drinks in one sitting was 1.4% (IIPS and WHO, 2006). The National Family Survey 3 (NFHS 3) observed that among individuals aged between 15 and 54 years, 2.2% of women and 32.0% of men drink alcohol. Among both men and women, the proportions of alcohol users increased with increasing age. While a majority of men and women consumed alcohol less than once a week (63.0% and 43.4%, respectively), 15% of female users and 10% of male users consumed alcohol almost every day. Among men, the proportions of users in urban and rural areas were almost similar but amongst women it was nearly 5-fold greater in rural areas compared with urban areas. In the North East, nearly one-third to half of men consumed alcohol and greater proportions of women consumed alcohol in Arunachal Pradesh (33.6%) and Sikkim (19.1%). In the entire country, only three states had less than one fifth of men consuming alcohol (Rajasthan 19%, Gujarat 16% and Jammu and Kashmir 12.5%) and the highest proportion of male alcohol users were from Arunachal Pradesh (61.1%) followed by Chhattisgarh (52.3%) as shown in the **Figure 3** below:



Top five states with alcohol prevalence

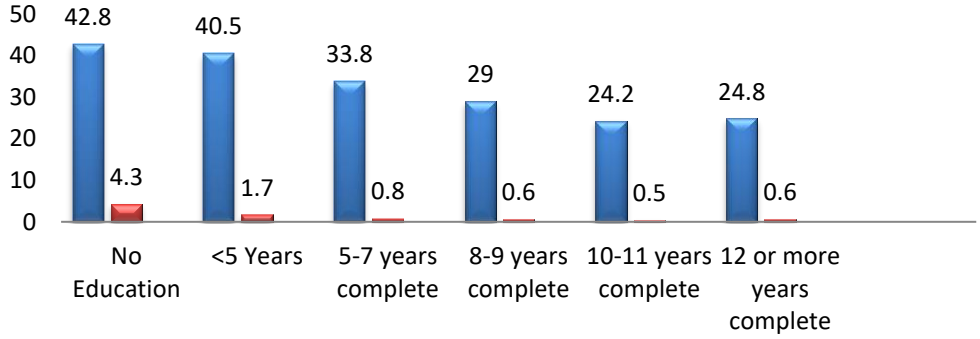
Figure 4: Top five states with least alcohol prevalence



Source:NFHS 3

Interestingly, the NFHS 3 observed decreasing proportion of users with increasing education. Greater wealth status and religion were found to have an influence on the proportions consuming alcohol. The National Sample Survey Organization (NSSO) has all along been examining alcohol expenditures (either separately or as part of household expenditure item) in a representative population of India. In a limited and crude way alcohol expenditure indirectly represents consumption patterns.

Figure 5: Association between alcohol and education (in %)



Source: NFHS 3

The consumable (potable) alcoholic beverages in India are usually divided into six major segments:

(1) Indian made foreign liquor- spirits (2) beers, (3) wines (4) country liquor (5) illicit and/or home brewed beverages and (6) a small but growing foreign-made foreign liquor segment. Indian made foreign liquor (IMFL): spirits predominantly includes the whiskey, rum, brandy, gin and vodka (IWSR, 2010). While most of the matured international markets have seen stagnant to

very moderate growth, the Indian Made Foreign Liquor market (estimated at 175-200 million cases annually), is increasing annually at 10 to 15% (Kurien, 2006b and IWSR, 2010).

- Wine is mainly consumed in urban India with Mumbai and Delhi accounting for approximately half the country's wine sales (ASSOCHAM, 08).

Socio-Demographic Analysis

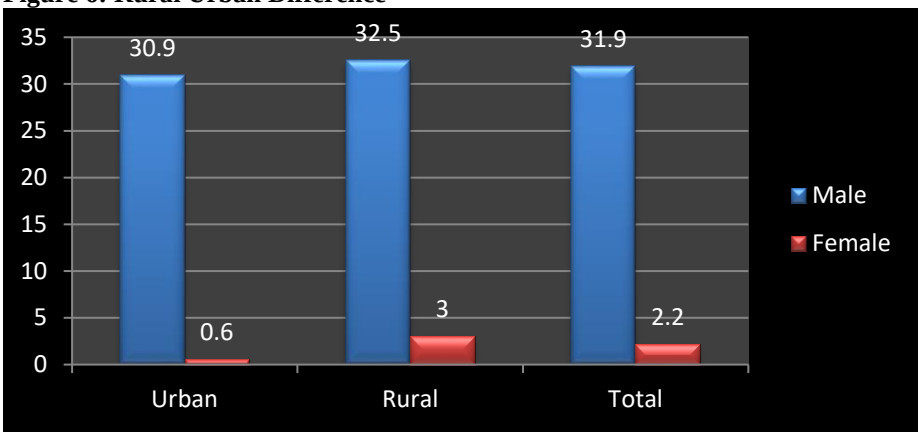
Age and gender specific differentials

The initiation of alcohol is beginning from early age. As highest number of alcohol users are being noticed in the age group of 20-35 years. Findings from the National Family Health Survey reveal that nearly 10% of the users were less than 25 years, 15% in 25–29 years, 23% in 30–39 years, 26% in 40–49 years and 40% above 50 years (NFHS 2). NFHS 3 reports higher alcohol use rates in both males and females; amongst 15 to 19 year old males and females, it was 11.0% and 1.0% respectively, as against 2.4% and 0.6% respectively in NFHS 2. Gupta et al (2003) in Rajasthan noticed that light drinkers were more in the younger age groups, while moderate drinkers were more in the middle age groups. Across Indian studies, prevalence of alcohol use amongst women has consistently been estimated at <5 % (Isaac, 1998, Sundaram et al, 1984, Benegal et al, 2005) but is much higher in the Northeastern states. Using data of NFHS II, Mini (2007), reported that 2.8% of Indian women drink alcohol. A recent regional assessment undertaken in the state of Karnataka in Southern India, as part of a collaborative WHO multi-center study (GENACIS) estimated alcohol use in the past year among 5.9% of adult females as against 32.7% of adult males (Benegal et al, 2005). It needs to be realized that figures pertaining to female use are liable to be underreported. Alcohol use especially among women is socially stigmatized in parts of rural India and there is a reluctance to report such use as women's drinking is viewed as more shameful and therefore is kept hidden (Benegal et al, 2003, Benegal et al, 2005).

Urban – Rural differences

Alcohol consumption is more prevalent in rural areas, transitional towns and tribal areas. The National Household Survey-2 revealed that rural individuals were 1.5 times more likely to use alcohol compared with urban users (Ray, 2004). This would be attributed to education, income, occupation and other social factors. Subramanian et al (2005) observed that the prevalence of alcohol use among both men and women was significantly higher in towns and villages as compared to large and small cities through NFHS 2 data. Nearly 22% and 17% of users were in towns and villages compared with 14.8% of users in larger cities. In the largest survey in rural Maharashtra in 1991, Bang and Bang (1991) reported that nearly 100,000 men in a population of four lakh used alcohol, of whom 20% were addicted. In a survey of 32,400 people in rural areas near Bangalore by NIMHANS, the prevalence was observed to be 1% in the rural population (Benegal et al, 2003). Other studies also show that higher use has been recorded among tribal, rural and lower socioeconomic urban sections (Ray and Sharma, 1994, Thimmiah, 1979). The WHO study of undocumented consumption recorded significantly higher prevalence of drinking in rural areas compared to urban areas. In the GENACIS study undertaken in the state of Karnataka, the prevalence of drinking among men was 23% in rural areas and 41% in urban areas among men, while similar rates among women was 4.4% and 7% respectively (Benegal et al, 2005). The health behavior study undertaken by NIMHANS has reported the prevalence of alcohol use (in the previous 12 months) in urban, rural, slum and town population as 8%, 9.5%, 19.0% and 6%, respectively. In the study on socioeconomic impact of alcohol across 4 communities, the alcohol prevalence rates were 24%, 21% and 28% among adult men in urban, rural, slum and town population, respectively, while it was <3% among women (Gururaj et al, 2006a). Residing in villages and brewing alcohol is significantly linked to alcohol use (John et al, 2009). NFHS-3 revealed that for either sex, proportions consuming alcohol were greater amongst those from rural than urban areas. Among females the ratio between urban to rural was 1:5 (0.6%: 3.0%) (NFHS-3, 2005-06)

Figure 6: Rural Urban Difference



Source: NFHS, 2005-06

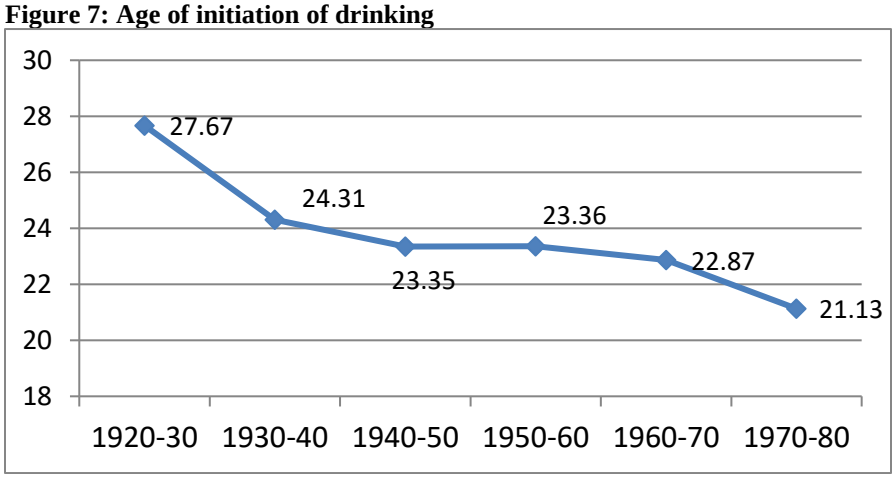
Education, occupation and income

The association between various socio-demographic variables such as education, occupation, income, marital status and others variables with alcohol use in India has not been clearly delineated and interlinked. The findings from the NSSO reveal that respondents with no formal education were more likely to be regular users of alcohol (NSSO, 2005).The data from NFHS 3 revealed that a majority (78% females and 26% males) of the alcohol users were illiterate and belonged to the poorer sections of society. Several studies have revealed higher rates of alcohol use in urban slums and rural areas, where educational levels are correspondingly low (Anand et al, 2007, John et al, 2009). Analyzing the data from the NFHS, Subramanian et al (2005) observed that the proportion of alcohol users was more than twice in the educationally deprived populations. Among women, those with secondary schooling levels and beyond were less likely to use alcohol; having no education was associated with a greater risk of alcohol consumption. Ghulam et al (1996), in Madhya Pradesh, noticed that drinking rates increased with education up to higher secondary levels and gradually decreased thereafter. Gupta et al (1995), in Rajasthan, observed that among those who consumed alcohol, 27% were illiterate and 17% were literate; graduates and above constituted 10% of the drinking population. Increased alcohol use to the extent of 47% was reported among illiterates in a community-based study in Arunachal Pradesh (Hazarika et al, 2000). Gupta et al (2003) from Mumbai observed that the current users and ever users of alcohol were higher by 20% among the illiterate population and those who had studied

up to primary levels. Mohan et al (2002) from Delhi observed that poor educational achievement was associated with the increased risk of alcohol disorders.

As discussed earlier, the pattern of drinking and age of initiation has seen a significant shift in recent times because of easy availability, affordability, peer pressure and media. Data indicate that a majority begin experimenting with alcohol by 15–17 years, a significant lowering from 25–29 years a decade back ago. Benegal et al (2002) reported the age at onset of alcohol use to be 22 years with an average duration of drinking of 10–12 years.

Figure 7: Age of initiation of drinking



Source: Benegal et al, 2002

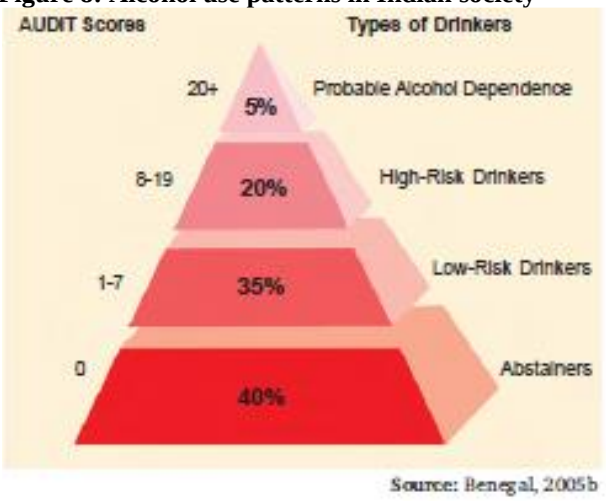
This means that from a public health point of view, with lowering of age, more number of people would fall into the larger pool of alcohol users from year to year. Studies from other parts of India reveal similar findings. Hazarika et al (2000) observed that more than 50 percent started drinking below the age of 21 years and the mean age of starting drinking was 21.6 yrs. In Rohtak city, it was observed that nearly 95% of respondents reported that their first drink was between 15 and 25 years, probably linked to peer group influences (Meena et al, 2002). Interestingly, Tripathi et al (1999) revealed that the extent of alcohol use among children <15 years varies from 0.2 to 0.3% in Delhi. However, this figure rises to 2.5–3.6% in the age group of 15–20 years. Among school going children, alcohol use was commonly accompanied with use of tobacco and mild tranquillizers. This increases disproportionately among selected group of street children and child laborers where along with alcohol, inhalants, drugs, cough syrups and smokeless tobacco are also mixed. The extent of substance abuse especially among college students has increased to 19–20% in different populations, commonly linked to peer-group influences, personality factors and prevalent attitudes of younger individuals (Khosla et al, 2008, Rai et al, 2008). Unni (2009)

studying adolescent attitudes and its relevance to family education programs incidentally observes that in the 7 co-educational English medium schools in Cochin, 6.5% boys took alcohol with peers or at family functions and age of initiation was 15 to 17 yrs.

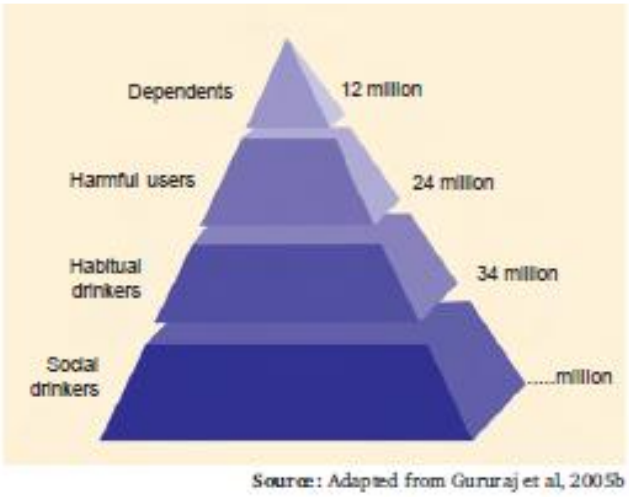
Patterns of Drinking

Both men and women consume very high quantity of alcohol on typical drinking occasions. It is very surprising that both men and women drink almost equally (Saxena, 1999, Isaac, 1998). An average of five standard drinks consumed on each drinking occasion technically qualifies for a 'heavy drinking situation' (Benegal et al, 2005).The frequency of use varies between men and women as men usually drink more frequently than women and that too in large quantites. 70% of the men drank daily or almost daily and 55% of the women consume alcohol regularly (Benegal et al, 2005) and this user frequency can almost not be termed "infrequent" drinking. This is contrary to earlier reports that assert that the prevalent pattern in India is infrequent use of large quantities (Saxena, 1999; Isaac, 1998). A large number of Indian drinkers, almost more than 50 percent do hazardous drinking, which is composed of one of heavy solitary drinking, mostly spirits and five standard drinks per occassion (Mohan et al, 2001, Gaunekar et al, 2004). The dominant drinking expectancies favor drinking to intoxication and alcohol use is strongly associated with expectations of dis-inhibition and violence, especially among men, which 'legitimizes' male drunkenness and violence (Benegal 2005; Gupta et al, 2003, Saxena, 1999). Indians drink to get drunk than limit consumption. It can be observed from Figure 8 that the proportion dependent (~12 million) on alcohol is a small portion amongst those consuming alcohol.

Figure 8: Alcohol use patterns in Indian society



Source: Benegal, 2005b



Source: Adapted from Gururaj et al, 2005b

From an intervention point of view, long term care and rehabilitation needs to be provided to these dependent users who usually do not reach even the dedicated de-addiction centers and other tertiary care centers. Early detection and timely treatment measures needs to be taken for nearly 24 million risky users in different health care setups. Such groups are at risk of getting long term complications of alcohol use. We need to adopt innovative methods to reach out to the 34 million such regular users and the numerous social drinkers.

Types of alcohol

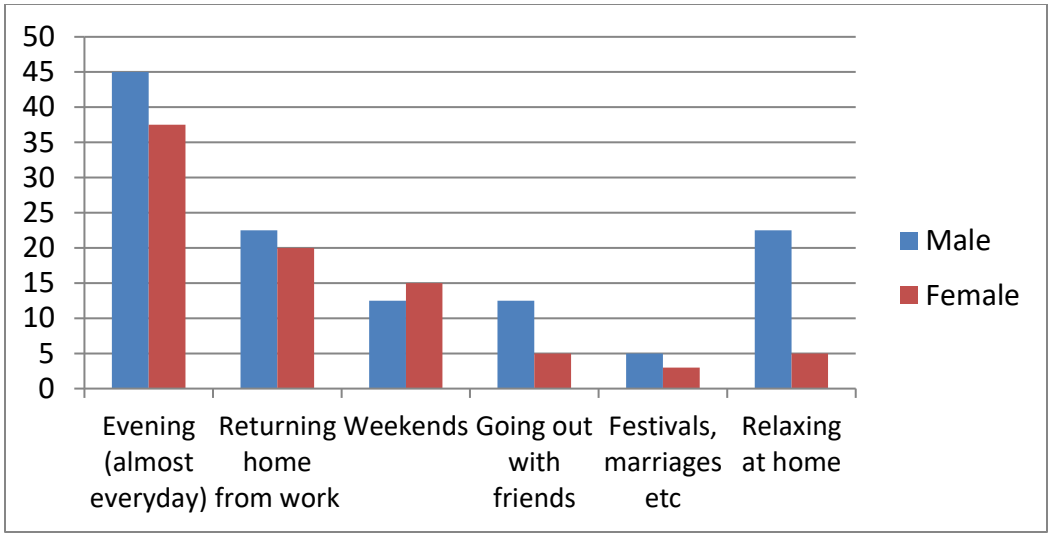
A variety of alcoholic drinks is found in India viz beer, whiskey and brandy to choose from. Beer, whisky and brandy have been the preferred drinks, while wine has been gaining popularity. Country liquor is still in use in rural areas. The type of drink varies among sexes, by age groups and between urban and rural areas,. Commonly arrack and rum are common in rural India. IMFL and beer are preferred drinks in urban areas and in younger age groups. Country liquor was the favored drink in those with a longer duration of drinking. Stratified analysis of the data revealed that nearly three-fourths of the study population was consuming more than 30 grams of alcohol in a day, irrespective of the type of drink consumed. Patterns also varied with availability and affordability. Silva et al (2003) in Goa noted that in their drinking population, 25% had rice beer, while 5% were regular wine drinkers. In a study of patients suffering from liver disorders it was observed that 80% were regular consumers of country liquor and illicit liquor. The most common beverage used was spirits (IMFL) among 70% of men (Narwane et al, 1998). In the Bangalore study, whisky and brandy (52%) was the commonest alcoholic beverage while 33% consumed

arrack (frequency of arrack use was higher in rural areas, town and slums) (Gururaj et al, 2006a, Girish et al, 2010). Benegal et al (2003) observed that 35% were using illicit alcoholic beverages, 38% used IMFL, 23% country arrack, beer<4% and imported liquor <1%.

Context of drinking

The situation in which most drinking occurs is basically under-socialized, solitary and often hazardous. The drinking spots have changed over time, especially during the last decade: pubs have rolled in and have become an important place of alcohol consumption in urban areas. In the countryside, alcohol is mainly consumed in local outlets which sell country liquor. Particularly Among heavy users, drinking is a swift, stealthy pursuit with gulping of large amounts of undiluted cheap alcohol (drinking the maximum possible in the shortest possible time). The above factors add up to a predominant pattern of hazardous use. To reiterate, more than one out of three people who drink, do so at hazardous levels and heavy drinkers are more likely to drink multiple beverages. Those who drink multiple beverages are generally less educated, have a significantly lower income and spend a larger proportion of their income to buy alcohol. Psychosocial distress is one of the triggering factors for greater alcohol use. For example, One of the major problems faced by administrators and medical relief personnel is the increase in alcohol consumption following disasters. During the recent tsunami in southern India, anecdotal reports observed that the alcohol consumption almost doubled and the associated brawls and other social disturbances hampered relief and rehabilitation work. Manickam and Basil (2006) report that, though there was decreased alcohol consumption immediately after the tsunami; it increased when the relief money was disbursed. In all, one-third (34.3%) of the study population were said to be abusing alcohol to cope with trauma consequent to disaster.

Figure9: Drinking situations



Reasons for drinking

Drinking usually starts in social circles, which later progresses to compulsive individual drinking and solitary drinking leads to habitual and addictive drinking. Ghulam et al (1996) from Madhya Pradesh observed that while introduction to alcohol was predominantly through friends in 93% of users (families 3%), 62% started using alcohol for being sociable, 6% for curiosity, 8% to relieve psychological stress and 24% for overcoming fatigue. Similarly, Meena et al (2002) noticed that 26% consumed alcohol to overcome worries, 15% to think and work better, 14% for cheering up and 8% to relax. Singh et al (2000) from Amritsar observed that three-fourths of the men consumed alcohol more to be in the social company of their friends.

Perceptions of alcohol use

In the present day, drinking is fast becoming a social event seen as 'normal', while 'drinking to intoxication' is culturally alleviated. In a corporate culture of the emerging cosmopolis India, alcohol consumption is getting defined as part of routine work culture, life style, family life and recreation (The Hindu, 2006). Hence, individual perceptions of alcohol use provide critical insight towards determining the consequences of alcohol use. Nimmagadda (1993) attempted to construct social meanings of alcohol use in India and found 5 broad themes and listed them to be (a) a symbol of economic status, (b) caste, (c) a person's karma, (d) a period of turmoil and (e) gender privilege (for the male). The men, masculinity and domestic violence report from Tamil

Nadu (Anandhi and Jayarajan, 2006) shows the perceived masculinity definition associated with alcohol use which is a major cause of domestic violence. Weber (1996) finds that increased levels of acculturation were associated with increased life time use of alcohol amongst the Punjabi community in Toronto. Aculturations was associated with liberal attitudes regarding alcohol use and more alcohol-use related problems. These processes of acculturation are not restricted to between countries. Gururaj et al (2006a) found that the proportion of adults consuming alcohol and patterns of use in transitional rural areas was intermediary between rural areas on one hand and slum and urban areas on the other.

Health consequences of Drinking

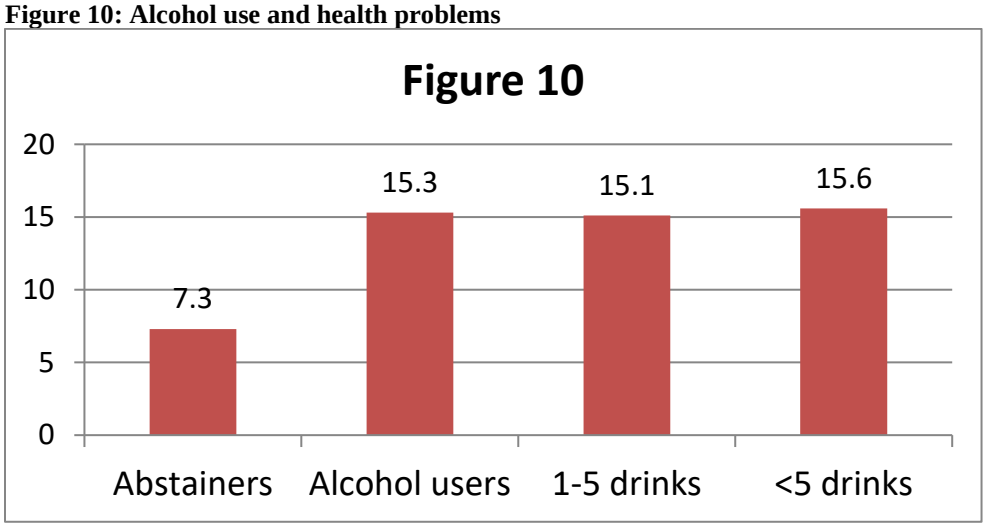
India is surrounded by vicious web of communicable diseases, non communicable diseases and injuries amidst the backdrop of socio-demographic and epidemiological transition. While deaths from communicable diseases reduced from 51-22%, those from non-communicable diseases and injuries have proportionately increased from 49–78% (Reddy, 2000). With steadily increasing per capita alcohol consumption and changing patterns, India is under strong impact of alcoholic diseases and mortality because of greater poverty and nutritional deficiencies. There is a direct relationship between alcohol consumption and risk of mortality and morbidity due to physical illness (Thun et al, 1997). . Data from other parts of the world indicate that heavy drinking is an important correlate of alcohol-related mortality (Rehm et al, 2001 and 2001).

Health Problems

Alcohol-related admissions accounted for over a fifth of hospital admissions (Sri et al, 1997; Benegal et al, 2001). Alcohol users generally report a greater frequency of ill-health. In a community survey, common problems reported by current alcohol users included generalised weakness (33%), impaired roles within the family and impaired social relationships. Additionally, about 20% complained of depression, anxiety and irritability. Between 2–10% complained of memory loss, cough and difficulty in breathing and poor sexual performance (Ray, 2004b). A study from North India (Jain et al, 1999) found alcohol consumption to be a risk factor for duodenal ulcer. Alcohol and tobacco have been found to be the commonest risk factors for non-communicable diseases in studies carried out in Haryana (Krishnan et al, 2008). The Bangalore study (Gururaj et al, 2006a) observed a significantly higher proportion of alcohol users (32.5% of the 3,258 alcohol users) reporting a health problem than nonusers (14.5% of the 3,745). A greater proportion of users reported their health status as “bad” in comparison to non-users (1.6% vs. 0.7%), and this observation was statistically significant. Alcohol users were three times at risk of suffering from a health problem. Chronic alcohol users were more likely to perceive their health status as poor and the probability of reporting a bad health status was 2.5 (95% CI) times higher in comparison to non-users (Gururaj et al, 2006a). Alcohol users also reported a higher incidence of negative life events, more injuries and increasing psycho-social problems and had sought more emergency as well as routine health care services. In the study by

Benegal et al (2003), heavy drinkers (those who drank more than 5 standard drinks per representative drinking occasion) were significantly more likely to suffer emotional problems like depression and anxiety, pain abdomen presumably indicative of alcohol-related erosive gastritis, and other somatic problems like headache and generalized aches and pains. This population also reported more frequent heart ailments, diabetes and increased blood pressure.

Figure 10: Alcohol use and health problems



Source: Benegal et al, 2003

Alcohol users, both male (78%) and female (75%) were also more likely to use various forms of tobacco than non-users (22% and 8% respectively), thus increasing the risk of overall health damage.

Injuries

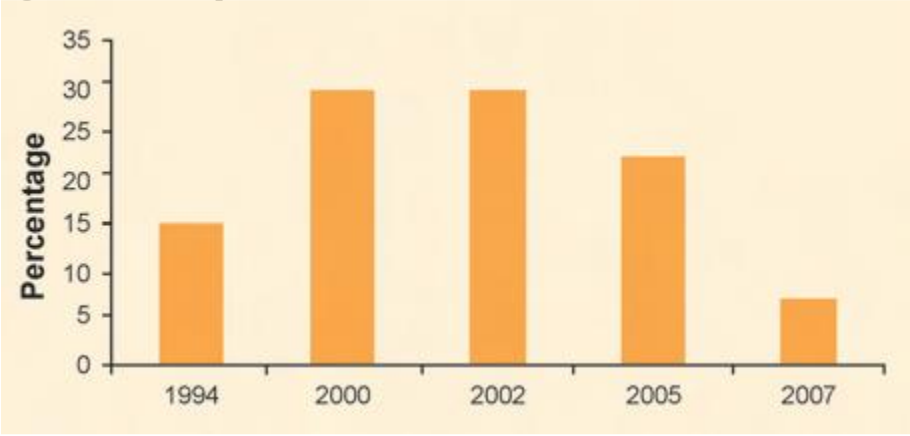
The prominent effects caused by consumption of alcohol include several physiological changes like changes in respiration, circulation, difficulties in making judgments and decisions, poor visions, delayed reflexes, improper co-ordination, problems in risk perception and recognition, sense of confidence, loss of self-control and increased risk taking, loss of inhibitions and enhances risk taking behavior (BISP, 2008). Also the individuals with suicidal intent consume drugs and organo-phosphorous compounds. Individuals get indulged in criminal activities causing injuries to others and to property because of loss of self-control and the intoxicating effects of alcohol. In major metros, drivers are tested for alcohol consumption using breath

analysers because sometimes, the involvement of alcohol is not recorded in official documents to help families of deceased to get compensated. There is enough evidence at the global level that alcohol consumption is closely linked to the occurrence of both unintentional and intentional injuries (WHO, 2009). It is estimated that 20–30% of all motor vehicle accidents, homicides and intentional injuries are alcohol-related (WHO, 2002). A recent WHO report, based on data from 12 countries revealed that 6–45% of injuries brought to emergency rooms were related to involvement of alcohol. Upto 45% of patients reported consuming alcohol prior to injury.

Road traffic injuries

A survey conducted in Delhi proposed that more than 45% of vehicles were being driven by drivers who had consumed alcohol. The pub capital of India, Bangalore city, reports the highest number of road accident deaths on weekends between 6.00 p.m. and 10.00 p.m. and the police points it mainly towards drunken driving (Agarwal, 2003). In roadside surveys carried out in Bangalore, 89% of the drivers were stopped on the doubt of drunken driving by the police and 37% of drivers were checked randomly who were were breath analysed positive for alcohol (Gururaj and Benegal, 2002).

Figure 11: Alcohol presence in road deaths



Source: BISP, 2008

A series of studies undertaken by the WHO Collaborating Center for Injury Prevention and Safety Promotion at the NIMHANS in Bangalore during the last decade revealed the following:

- The extent of alcohol use varied between 10–30 % in all fatal road crashes, based on 5 studies undertaken during 1994–2007. Selective examination of night-time crashes indicated that nearly one-third of crashes were directly attributable to alcohol consumption.
- One out of four non-fatally injured road crash patients brought to casualty departments of hospitals was alcohol-positive as per physician certification (Gururaj et al, 2010).
- Night time crashes account for nearly 30–40% of total RTIs. Alcohol consumption (based on self reports and certified medical diagnosis) was documented in 15–25% of these injuries (Gururaj 2004a, 2004b). In the rural areas, alcohol use among those fatally injured was nearly 2%, but alcohol use in the driver of the colliding vehicle was 17%.
- The amount of alcohol consumption based on breathalyzer analysis revealed that 40%, 27% and 10% had moderate, severe and very severe levels of intoxication as specified by WHO ICD Y90 codes (Gururaj and Benegal, 2002).
- Risk of mortality increased by 2.2 times among those under the influence of alcohol (Gururaj and Benegal, 2002).
- In Bangalore city alone, the number of cases booked by the police during 2001–2005 for drunken driving increased from 27,000 to 33,000 (Gururaj et al, 2010).

Violence

Alcohol consumption leads to many violent factors: family violence, spousal abuse. No clear data is available from India through scientific studies, but anecdotal media evidence confirms this beyond doubt. Data from Bangalore reveal that nearly 15 persons are brought every night by police for certification purposes to one large public sector hospital alone (Gururaj et al, 2010). Bhatt (1998) observed that the incidence of family violence is significantly higher in families who use alcohol. The risk of spousal abuse increases significantly with an alcoholic husband (Rao, 2004).

Cardiovascular disorders

It is increasingly evident that with higher levels of alcohol consumption, as well as with binge drinking, there are greater risks for coronary heart disease and other cardiovascular events such as sudden cardiac death and stroke (Gill et al, 1991; Hart et al, 1999: Prospective Studies Collaboration, 2002; Room et al, 2005; Rehm et al, 2006a). In a cross-sectional study of

behavioral risk factors for cardiovascular and other chronic diseases, 6,579 individuals from Kerala were evaluated for chronic diseases, behavioral risk factors and family history (Sugathan et al, 2008). Smoking and alcohol consumption were two major risk factors associated with chronic disease conditions. Supporting evidence for the adverse impact of drinking on coronary disease in developing countries like India comes from a recent study of 4,465 present or past alcohol users.

Social consequences of drinking

The manifestation of the social consequences of alcohol abuse can be witnessed at three different levels:

- Individual,
- Family and
- Society.

At the individual level, the alcohol user as a result of the habit find themselves unable to fully participate and contribute; at the family level, alcohol use is a social nuisance and at the societal level, the consequence of alcohol use is grave and is related to a host of issues which include road traffic injuries, violence and crime, productivity losses and are generally drained on social welfare.

Individual Level effect

Personal life

Gururaj et al (2004), observed that an alcohol user, in comparison to a non-user, experienced higher incidence of negative life events: poor health status, getting injured, involvement in different types of abuse (physical, emotional and sexual; against spouse, children, family members and friends), greater problems in workplace, psychological problems, economic problems, etc. Shah et al (1996) in their study of 100 alcohol dependents reported that almost two-thirds had social and recreational problems. There were significant changes in the nature of socializing, with social life being restricted to procuring and drinking alcohol. The National

Household Survey reports that 27% of the alcohol user population complained of inability to visit friends/relatives and inability to perform as husband/father (Ray, 2004).

Work related

Work is affected by alcohol consumption by way of absenteeism, decreased productivity and unemployment (Green facts, 2006), and work place injuries and accidents (Murthy et al, 2004). In the Indian context, although alcohol use in employed individuals is described, the consequence on the process of work is inadequately documented. Depending on the skill, nature of work or employment status of the individual the cost calculated would vary. An acute event (major or even minor one) leading to an absence from work in IT industry could result in loss of productivity equivalent to several thousands of rupees as against the loss in productivity and lower cost of a daily wage laborer. In the Bangalore study, 7% of the respondents confessed that they were under the influence of alcohol while at work (Gururaj et al, 2006a). In a very large transport corporation in south India, 2% of employees came drunk to work and there were numerous instances of violence at work (Murthy et al, 2004). In a study of occupational injuries, Vasu et al (2001) found that the injured were majorly young males, not wearing protective eyewear and working under the influence of alcohol. A recent survey among high income earners in Bangalore city revealed that 70% of them consumed alcohol on a weekly or biweekly basis and 20% consumed alcohol daily. Interestingly, 68% suffered hangovers, which resulted in absenteeism: nearly 33% reported late to work, 6% took half a day off and 23% took the entire day off. Forty percent of the respondents admitted that hangovers affected their productivity. The loss in productivity due to such absenteeism is estimated to be Rs.470 million every year for the corporate sector (The Hindu, 2006).

Family level

Alcoholism has been considered a family disease. An individual's alcohol tolerance makes the family go through strong psychological suffering. In a community based study, Gururaj et al (2004) observed that nearly 40% of the households surveyed had at least one alcohol consumer. Isaac (1998) noted the growing evidence of alcohol as a major cause of family disruption and marital discord. Family violence is significantly higher in families who use alcohol (Bhatt, 2003) and the risk of spousal abuse increases significantly when the husband is an alcoholic (Rao,

2004). The stress faced daily by the wife includes her husband's drinking, financial problems, physical abuse of self and children and, social stigma (Shantala et al, 2000). Another side of alcohol consumption is the loss of quality time spent with the family members as revealed by the high income group study in Bangalore; 60% consumed alcohol over the weekend, thereby missing quality time with family and friends (The Hindu, 2006)**.**

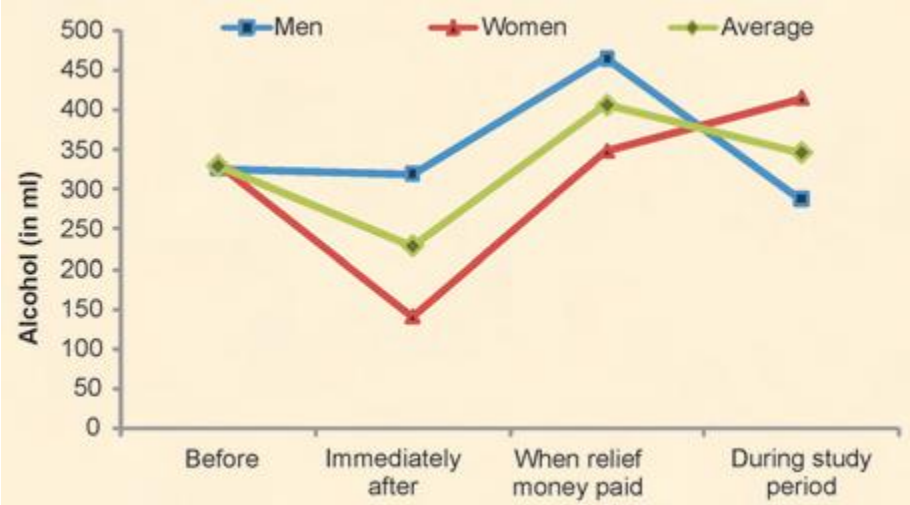
Family finances

The family of an alcohol user is at a twin disadvantage: firstly, unemployment or underemployment of the productive member results in lesser financial resources; secondly, the already available meager resource needs to be either voluntarily or forcibly shared for buying alcohol. This impoverishment can push families downwards in the presence of a negative event in the family, for example, management of an injury after a violent episode at home. Benegal et al, (2003) observes that nearly one fourth of the family income was spent on alcohol. Gururaj et al (2004) found that 4.4% of the study group of 200 alcohol users spent greater money on alcohol as a head of expenditure with the only other head of expenditure being loan repayment (7%). This proportion was equivalent to that spent on rent (4%) and greater than that spent on either education (2.5%) or other household expenses (2%). Saxena et al (2003) reported that those households in which an individual consumed alcohol very frequently spent 14 times more on alcohol per month and had significant financial debt. Further, these households reported more cases of major illnesses, but perceived significantly less severe health, social and economic effects of drinking. It has now been empirically proved that healthcare costs can result in catastrophic impoverishment, particularly among alcohol using households. These include severe adverse cnsequences like debt entrapment and distress selling of assets (Krishna, 2004, Bonu et al, 2005). Among individuals who resorted to distress sale of assets and borrowing during hospitalization, 16% could be attributed to alcohol/tobacco use at the population level and nearly 50% at the individual level.

Manickam and Basil (2006) reported that 7% spent the entire tsunami relief money on alcohol and nearly two-thirds (65%) spent varying proportions (1 to 100%). On an average, while rs.15 was being spent by men on alcohol before tsunami it declined to rs.12 immediately after tsunami and increased to rs.21 during the disbursement of relief money. Neufield et al (2005) observed that being disadvantaged, poor, residing in rural areas, or being illiterate was associated with

greater alcohol use as compared to others. Hence the costs, consequences and implications of other category of users gets inadequately documented. In addition, not all costs are uniformly reported in community based studies (Gururaj et al, 2006).

Figure 12: Alcohol consumption and tsunami



Source: Manickam and basil, 2006

Societal impact

Alcohol and crime

There are many serious consequences of prohibition of alcohol which result in anti-social activities like thefts, homicides, crimes etc. These events are merely anecdotal or taken for granted without adequate document.

Law enforcement

The National Crime Records Bureau (Crime in India, 2008) documents alcohol related crime chiefly under either Prohibition Act or Excise Act. There are several other pieces of legislation which provides for punishment for alcohol use. These include Gambling Act, Drugs and Cosmetics Act, Motor Vehicles Act, Indian Railways Act, etc., Apart from these specific pieces of legislation, enforcement is also made under the provisions of the Indian Penal Code and the

related Criminal Procedure Code and Narcotic Drugs and Psychotropic Substances Act (Gandhi, 2000). There are several challenges and barriers for strict enforcement of these laws in the Indian context. Scant resources, uncertain attitude towards alcohol use, positions of victimization, considerable time lag in delivery of justice and lack or Non-availability of evidence are often some major stated reasons. Media reports indicate that there is a considerable time lag between booking and clearing of cases, more so when celebrities are involved. The huge pendency of the cases in the courts of law is said to be another major reason for cases not being booked. In this spiteful chain of events, the economic costs of running these systems and the contribution of alcohol in the occurrence of these events are often overlooked and difficult to quantify.

Mass tragedies

Consumption of illicit liquor containing methanol is responsible for the death of several people, serious blindness, disabilities etc. methanol is often an adulterant in illicit alcohol brews. Illicit manufacturing and trading in spurious liquor is rising due to its being a state subject and its distinctive feature of being second largest revenue grosser for many states. Methanol, an industrial solvent is often an adulterant in illicit alcohol brews and has been responsible for the death of several people and a cause of the periodic 'hooch tragedies' across the country (Box 15). In July–August 2009, the country witnessed the greatest number of deaths (143 reported deaths) subsequent to consumption of spurious liquor in the state of Gujarat (a state under prohibition). In 2002, in Tamil Nadu, 100 people died in 3 separate incidents after consumption of illicit liquor containing methanol (Subramaniam, 2002). Most of them were poor farm workers addicted to alcohol. Over 280 deaths were reported in the state of Karnataka in the previous 4 years, 200 in Orissa in 1992, 50 in Bihar in 1994, 50 in Andhra in 1993, 34 in Kerala in 2000. Incidents with smaller numbers go totally unreported. Methanol, when it does not kill, leaves people with serious disability, especially blindness. As noted earlier, undocumented and illicit consumption contributes to around 50% of total alcohol consumption. Being a state subject and having the distinction of being the second largest revenue grosser for many states, higher alcohol taxes have resulted in rise in illicit manufacture and trade of spurious liquor. This higher tax and higher costs of illicit liquor have resulted in several instances of mass casualties after consuming illicit liquor. Poor and socially backward community members are often the victims. The model excise policy (Sinha, 2005) observes that wrong policies and acts of commissions and

omissions of the excise and police officials are responsible for such hooch tragedies. Further it observes that “commissions of inquiry have often attributed such tragedies to the lack of availability of cheap liquor to the poor”.

Economic costs for consumption of alcohol

By changing the economic impact of alcohol use in monetary terms, the accuracy of economic cost of alcohol on Indian society can be well determined which includes direct cost like medical cost, lost earnings due to death etc and indirect costs like loss of school, assets etc. data from several national departments like police, transport, hospital helps to understand the monetary effect of the above consequences. Systematic efforts are required to be adopted to avail the data in crucial aspects of healthcare. In economic circles, net costs of providing services and the expenditure incurred by various departments is favored to individuals costs, all individual costs add up to total cost. In addition, as in the case of road traffic injuries, vehicle and property compensations need to be included. Legal costs can sometimes be huge and phenomenal as in the case of litigation. Understanding the monetary impact of these consequences depends on availability of nationally representative data from different sources like hospitals, transport department, police department and legal services. Repair costs, insurance costs and other costs include costs of loss of property. The intangible costs of alcohol use like death, pain, suffering and bereavement are difficult to estimate. In economic terms these intangible costs “cannot be bought or sold” and hence the cost of reduction in pain and suffering depends on the values attributed by the society. Reviewing the Canadian data, Bernard et al (1997), listed different cost categories that have been looked into to arrive at the cost of Alcohol-Tobacco-Drug abuse in Canada. It has to be noted that such detailed information is not readily available in India. The obtainable data for many countries indicate huge socio-economic burden in every society. Lack of data in crucial aspects of healthcare calls for more systematic efforts and a revisit to the research priorities. Rajendram et al (2006) observed that the global promise to alcohol-related research is only one-sixth of that warranted by the burden of disease due to alcohol and calls for more interest and investment in alcohol-related research in the developing world, proportionate

to the regional burden of harm from alcohol. A key question raised in economic spheres is the cost of providing a range of services and the expenditure incurred by various departments to deliver these services. While calculating, the net costs is preferred to individual costs, all individual costs add up to total costs. Apart from costs to governments, the resources spent by a family for various expenses needs to be factored in as much of the health and related expenditure in India is borne by the family as out of pocket expenditure (MOHFW, 2009). This needs to be seen in a scenario where private sector costs are raising and insurance coverage for Indian population is less than 5%. In addition, it is essential to realize that pain and suffering are difficult to measure even with advanced research techniques. Economic impact has been attempted for all public health problems like cardiovascular diseases, cancers, road accidents, respiratory diseases and many others. Considering the high costs of service delivery after an event has occurred, many governments, especially in HICs, have put a greater emphasis on prevention and early management as it saves enormous resources to governments. No such activity has been undertaken for alcohol related problems in India. We have tried to develop a template on which such costing needs to be done and hope this would be undertaken in the coming days. As noted earlier, the revenue generated from taxes on alcohol is the second important source of revenue to many state governments. What is generally not documented is the outflow from the exchequer to manage the health, social, legal, enforcement and non-health consequences of alcohol use. Social costs of alcoholism far exceed the revenues which get generated (Benegal et al, 2000). Working on a relatively small sample of alcohol dependents they estimated the total costs for an alcohol dependent as ≈Rs.30,000 per month. The total outgo from the state exchequer towards alcohol dependents was estimated to be Rs.18 billion as against the excise revenue of Rs.8.46 billion. The frequency of ill-health is greater for an alcohol user and in addition the consequences of acute intoxication and the resultant injuries or other health effects either for the self or the family members particularly the spouse falls on the health sector. The average cost of caring for a traumatic brain injury patient was estimated to be Rs 2,200 per hour. Health sector spends enormous amounts on diagnosis and management/ rehabilitation; the costs would be huge, though unmeasured. The costs of premature mortality, the opportunity costs of sickness, costs of caring for chronic alcoholics or the dependent users either at the family level or within institutions (healthcare or others), the loss of resources to the family, the cost of

decreased production or sickness absenteeism are some of the other costs that contribute significantly to the problem of alcohol use.

Interventions taken in India to control alcohol consumption

1. **Suppy reduction**: Alcohol supply can be reduced by prohibition. Prohibition can be complete, partial or prohibition only on certain days of the week or month. Example Gandhi Jayanti, Independence day etc. alcohol prohibition is a state subject and each state has full control on alcohol regulation, excise rates, production and sales. At present Gujarat and Mizoram have complete prohibition in force. Tamil Nadu, Kerala, Andhra Pradesh, Karnataka and Uttar Pradesh have ban on production and consumption of arrack.
2. **Decrease in consumption**: Increase in taxes and curtailed production can push cost higher and decrease alcohol consumption. The world Bank (2006) found that taxing alcohol reduces consumption and estimated that a 10% increase in price reduces consumption of beer by 3%, wine by 10% and distilled spirits by as much as 15%.
3. **Age limit to access alcohol**: a higher minimum age for legal access to alcohol is projected to reduce public health consequences. With each delayed year of initiation, there is reduction in likelihood of developing alcoholism or the risk of alcohol abuse.
4. **Density and location outlets**: There are specific guidelines in excise acts in most of the states which instruct the number of outlets permissible in specific areas and restrictions regarding the location of such outlets.
5. **Advertisements and promotion restrictions**: The Press Council of India strictly bars any advertisement that “promotes directly or indirectly production, sale or consumption of cigarettes, tobacco products, wine, alcohol, liquor and other intoxicants”. The alcohol industry clearly shuns these regulations by surrogate advertisements like bottled water, soda, life style accessories etc. more than 50% television viewers have access to cable televisions at home and advertising influences 431 million Indians and 275 million Indians are effected indirectly.

6. **Role of International bodies**: World Health organization is supporting individual countries to address health consequences of alcohol use. In its resolution, it calls for member states “to develop, implement and evaluate effective strategies and programs for reducing the negative health and social consequences of harmful use of alcohol and also encourage mobilization and active and appropriate engagement of all concerned social and economic groups, including scientific, professional, nongovernmental and voluntary bodies, the private sector, civil society and industry associations, in reducing harmful use of alcohol”. WHO has focused on providing technical knowledge and policy directions to member countries, including India. Except a few small research or demonstration programs, no large scale programs have been undertaken in India. Recently, efforts are underway to develop the “Framework Convention for Alcohol Control”, on similar lines of tobacco, to strengthen efforts across countries.

Recommendations

Alcohol exhibits a complex and multidimensional relationships with health and social outcomes. It is essential to maintain and increase our efforts to develop a society that is free from harmful effects of alcohol.

Inter-sectoral action is a skilled initiative that can take a long time to achieve results, but it is sustainable in the long term (Erika Blas, et al., 2010). International case studies and reviews puts a strong body of evidence that inter-sectoral alcohol control programmes are essential to address the social determinants of health through both population-based strategies and interventions, and target groups interventions (WHO, 2007; Health First, 2013). For instance, economical management of alcohol through pricing & taxation, legislation for drink driving & age restrictions, market analysis- product & packaging, sensitizing population for public support against alcohol harm, early interventions for addiction, etc are examples of collaborative efforts to reduce the alcohol harm worldwide.

The strategies/ activities that could be adopted include:

Reduce Supply:

i) The government should undertake stern regulatory measures towards reducing production and sales of alcohol. Constant efforts are required to discourage illegal beverage production, adulteration, use and sale.

ii) The prices of alcohol should be strongly linked to the volume of ethyl alcohol in alcohol products. Taxes should be high for alcoholic beverages with high ethyl alcohol. Strict regulation should be enforced for alcohol industry with regard to marketing, promotion, minimum pricing and discounting.

Reduce Demand:

i) Surrogate and umbrella advertisements linked to alcohol and other promotional strategies must be banned. Advertisements and promotions must be completely banned.

ii) The alcohol industry must provide correct and impartial information to the public on effects and dangers of alcohol on a continuous basis to enable people to recognize harmful effects of alcohol. Effective campaigns to change public attitudes against alcohol consumption

needs to be undertaken on a large scale to intensify understanding of harmful effects of alcohol. Awareness programs in educational institutions and work places should be commenced to increase awareness among young students and employees as part of larger life skill awareness activities. Alcohol industry should be strongly informed to put health warning labels to inform consumers about ill effects of alcohol use.

iii) The existing laws with regard to legal blood alcohol limit for driving should be retained at the current levels of 30 mg per 100 ml as per the Indian Motor Vehicles Act. Penalty levels should be higher than Rs. 2000 for the first offence and with subsequent penalties, it should be increased 3 times along with cancellation of license based on points approach for repeat drink driving offences. Counseling can be incorporated for the challaned individuals. All fatal injuries, road crashes, should be investigated at the time of autopsy and alcohol attribution has to be reported.

iv) Reporting of alcohol involvement in road crashes should be rigorously improved and breath analysers should be made available in all hospitals and police stations.

Preventive measures to address vulnerable populations

Children should be provided life skill developing and coping skills. Persons with underlying mental illness particularly mood and anxiety disorders, psychotic disorders and those with personality attributes of impulsivity should be provided special attention to prevent alcohol related problems.

Measures for better management of alcohol related harm

i The use of evidence based treatment approaches (both pharmacological and non-pharmacological) to manage alcohol problems.

ii The facilities for treatment of persons available at present should be scaled up to cover both rural and urban populations across the country.

iii Advanced interventions (detoxification, inpatient facilities) at district and tertiary level facilities need to be developed and implemented.

iv Care for persons with alcohol related problems must occur as a holistic approach with the active involvement of families and care givers at every stage.

v Mandatory treatment of employees with known alcohol related problems should be introduced in all work places and institutions to help individuals.

Development of health human resources for effective service delivery

i. Human resource development and capacity strengthening of professionals from health, (advocacy, care and services, data management) police (enforcement and regulation), transport (motor vehicle rules), excise (taxation, production, sales, and distribution), law and order (legal guidelines for laws) are crucial to implement programs for alcohol control.

ii. Appropriate training of health professionals in recognizing and managing alcohol and other drug related problems, recognizing and intervening for harmful alcohol use in communicable and non-communicable disease conditions must occur in under-graduate and post-graduate training.

Drink-driving policies:

Alcohol policy measures such as increased prices of alcohol, minimum purchase laws, outlet density reduction supported by mass media campaigns can help in reducing road traffic fatalities. Random breath testing in which police regularly stops driver at random to check the concentration of alcohol in their blood, sobriety checkpoints help in reduction of alcohol related injuries. There is evidence for some effectiveness of setting low concentrations of alcohol in blood, including a zero level, for young or novice drivers; administrative suspension of the driver's license for the drivers caught driving in over limit.

Empower the community

Community education and health care measures are priorities. Apart from this:

1. Development of good community partnerships and networks to enhance mindfulness, convey life skills, progress healthy recreational avenues and improve early help seeking for vulnerable individuals and support for recovery.
2. Interest groups representing victims of alcohol can be powerful agents of change and development. Empowerment of such groups must be catalyzed and supported.
3. Health promotion should be given major importance as education alone cannot deliver the expected results. Developing an environment and system for implementing policies and programs is an essential prerequisite for facilitating implementation of policy guidelines.
4. Inter sectoral approaches are crucial to implement alcohol control programs. It is essential that all different ministries reach consensus by keeping health of the people as the central focus and identifying measures to be undertaken over time.
5. Advocacy towards reducing harm from alcohol aimed at policy makers, parliamentarians and the press is crucial to formulate programs and can reverse the growing trend of harm from alcohol.

The WHO (2010), through its Global Strategy strongly encourages the strategy of strengthened partnerships and better coordination among stakeholders. The global strategy aims to give guidance for action at all levels, to set priority areas for global action and to recommend a policy measures. The key objectives are:

Raise global awareness of the magnitude and nature of the health, social and economic harms caused by alcohol.

Increase commitment from the Government to strengthen knowledge base on the magnitude and determinants of the alcohol related harms.

Technical support should be enhanced by Member states for preventing harmful use of alcohol and management should be effective for alcohol use disorders and associated health conditions.

Partnerships and co-ordination among various stakeholders should be strengthened and mobilization of resources should be increased.

Monitoring and surveillance at different levels should be improved and dissemination and application of information should be more effective for advocacy, policy development and evaluation.

With the WHO guidelines and other evidence based research available; advocating, enabling, and mediating good health practices can be potentially established. Alcohol control can be possible with health promotion in India through Ottawa charter lenses as follows:

(Ottawa Charter for Health Promotion, 1986. WHO, Europe).

Build healthy public policy	Health promotion policy combining inter-sectoral approaches including legislation, fiscal measures, taxation and organizational change to curb supply of alcohol. .
Create supportive environments	Systematic assessment of the health impact of a rapidly changing environment – Eradicate conditions which make people victim of alcohol.
Strengthen community action	Health promotion through concrete and effective community action in setting Priorities – Involve community for evidences of alcohol harm, sensitization & active participation.
Develop personal skills	Health promotion -School & work place health promotion programmes.
Reorient health services	Reorient health services beyond its responsibility for providing clinical and curative services to public health research & advocacy.

References

- Gururaj G, Pratima Murthy, Girish N & Benegal V. Alcohol related harm: Implications for public health and policy in India, Publication No. 73, NIMHANS, Bangalore, India 2011.
- Rahman L (2003). Alcohol prohibition and addictive consumption in India, (http: www.nottingham.ac.uk/)
- Hill L, Clarke D, Casswell S (2011).Addressing the harmful use of alcohol- A guide to develop effective alcohol legislation, WHO.
- ASSOCHAM (2008). Domestic wine consumption will touch 9 million liters, press release. Sep 17th 2008. http://www.assocham.org/prels/shownews.php?id=1682.
- Anderson P et al; Effectiveness and cost effectiveness of policies and programs to reduce the harm caused by alcohol; Lancet 2009;373;2234-46.
- Benegal V, Gururaj G, Murthy P (2003). Report on a WHO Collaborative Project on Unrecorded consumption of Alcohol in Karnataka, India accessed from http://www.nimhans.kar.nic.in/Deaddiction/lit/
- Benegal V, Nayak M, Murthy P, Chandra P, Gururaj G (2005). Women and alcohol in India. In Alcohol, Gender and Drinking Problems. Perspectives from Low and Middle Income Countries. In: Obot Is, Room R, editors. World Health Organization, Geneva.
- Singh G (1986). Epidemiology of alcohol abuse in India. In the proceedings of the Indo US symposium on alcohol and drug abuse. In: Ray R, Pickens R W (Eds). NIMHANS Publication No. 20, Bangalore.
- Ray R (2004). The extent, pattern & trends of drug abuse in India, National Survey, Ministry of Social Justice & Empowerment, Government of India & United Nations Office on Drugs & Crime, Regional Office For South Asia.
- WHO (2004). Global status report on Alcohol. World Health Organization, Geneva.
- Pal HR, Saxena S, Chandrashekhar K, Sudha SJ, Murthy RS, Thara R et al (2000). Issues related to disability in India: a focus group study. The National Medical Journal of India. 13(5):237-41. PMID:11190051.
- Das SK, Balakrishnan V, Vasudevan DM (2006). Alcohol: its health and social impact in India. National medical Journal of India. 19(2):94-100.

- Benegal V (2005). India: alcohol and public health. Addiction. 100:1051-1056.
- Gururaj G (2006). Healthy Urbanization: Optimizing the impact of social determinants of health on exposed populations in urban settings: The Bangalore Scoping Study; preliminary report submitted to World Health Organization, Kobe Centre, Health Urbanization Project.
- Ray R (2004). The extent, pattern & trends of drug abuse in India, National Survey, Ministry of Social Justice & Empowerment, Government of India & United Nations Office on Drugs & Crime, Regional Office for South Asia.
- IIPS and WHO (2006). Health systems performance assessment: World Health Survey, 2003 India. International Institute of Population Sciences, Mumbai and World Health Organization, WHO-India- WR-Office, New Delhi.
- Gupta PC, Saxena S, Pednekar MS, Maulik PK (2003). Alcohol consumption among middle-aged and elderly men: a community study from western India, Alcohol and Alcoholism. 38:327-31.
- IWSR (2010). India report, International Wine and Spirits Research, 2010.
- Kurien B (2006). Heineken eyes 50% in local beer co; Economic Times; Friday, MAY 05, 2006.
- Indian Institute of Population Sciences and Macro International, 2007. National Family Health Survey (NFHS 3), 2005-2006: India. Indian Institute of Population Sciences, Mumbai.
- NSSO (2005). Household consumer expenditure in India; Report No 505, 60th Round, Ministry Of Statistics & Programme Implementation, Government of India, New Delhi.
- Mohan D, Chopra A, Sethi H (2001). A rapid assessment study on prevalence of substance abuse disorders in metropolis Delhi, Indian Journal of Medical Research. 114:107-114.
- Subramanian SV, Nandy S, Irving M, Gordon D, Smith GD (2005). Role of socio economic markers and state prohibition policy in predicting alcohol consumption among men and women in India: a multilevel statistical analysis, Bulletin of World Health Organization. 83(11):829-836.
- Bang AT and Bang RA (1991). Community Participation in Research and action against alcoholism. World Health Forum. 12:104-109.

- Neufield KJ, Peters DH, Rani M , Bonu S, Brooner RK (2005). Regular use of alcohol and tobacco in India and its association with age, gender, and poverty. Drug and Alcohol Dependence. 77(3):283-291.
- Room R, Graham K, Rehm J, Jernigan D, Monteiro M (2003). Drinking and Its Burden in a Global Perspective: Policy considerations and options. European Addiction Research. 9:165-175.
- Ghulam R, Rahman I, Naqvi S, Gupta SR (1996). An epidemiological study of drug abuse in urban population of Madhya Pradesh. Indian Journal of Psychiatry. 38(3):160-165.
- ASSOCHAM (2008). Domestic wine consumption will touch 9 million liters, press release. Sep 17th 2008. http://www.assocham.org/prels/showews.php?id=1682 accessed on October 2009.
- Ray R and Sharma HK (1994). Drug addiction – An Indian perspective. In Bashyam VP (Ed) Souvenir of ANCIPS 1994 (106-109) Madras; Indian Psychiatric Society.
- Thimmaiah G (1979). Socio-economic impact of drinking, state lottery and horse-racing in Karnataka. Sterling, New Delhi, Pp43 & 120.
- Gururaj G, Girish N, Benegal V (2006). Alcohol control series 1: Burden and socio-economic impact of alcohol - The Bangalore Study. New Delhi: World Health Organisation, Regional Office for South East Asia.
- John A, Barman A, Bal D, Chandy G, Samuel J, Thokchom M et al (2009). Hazardous alcohol use in rural southern India: nature, prevalence and risk factors. The National Medical Journal of India. 22:123-5.
- Anand K, Shah B, Yadav K, Singh R, Mather P, Paul E, et al (2007). Are the urban poor vulnerable to non-communicable diseases? A survey of risk factors for non-communicable diseases in urban slums of Faridabad. The National Medical Journal of India. 20(3):115-20.
- Gupta R (1996). Lifestyle risk factors and coronary heart disease prevalence in Indian men. Journal of Association of Physicians of India. 44(10):689-93.
- Gupta R, Sharma S, Gupta VP, Gupta KD (1995). Smoking & alcohol intake in rural Indian population & correlation with hypertension & coronary heart disease prevalence. Journal of Physicians of India. 43(1):253-58.

- Hazarika NC , Biswas D , Phukan RK , Hazarika D, Mahantha J (2000). Prevalence & pattern of substance abuse at Bandardewa, a border area of Assam & Arunachal Pradesh. Indian Journal of Psychiatry. 42(3):262-266.
- Mohan D, Chopra A. Sethi H (2002). Incidence estimates of substance use disorders in a cohort from Delhi, India. Indian Journal of Medical Research. 115:128-135.
- Silva MC, Gaunekar G, Patel V, Kukalekar DS, Fernandes J (2003). The prevalence and correlates of hazardous drinking in industrial workers: A community study from Goa India. Alcohol and Alcoholism. 38(1):79-83.
- Meena, Khanna P, Vohra AK, Rajput R (2002). Prevalence & pattern of alcohol and substance abuse in urban areas of Rothak city. Indian Journal of Psychiatry. 44(4):348-352.
- Tripathi BM and Rakesh Lal (1999). Substance abuse in children and adolescents. Indian Journal of Pediatrics. 66(4):569-575.
- Khosla V, Thankappan KR, Mini GK, Sarma PS (2008). Prevalence and predictors of alcohol use among college students in Ludhiana Punjab, India. Indian Journal of Medical Research. 128(1):79-88.
- Rai D, Gaete J, Girotra S, Pal HR, Araya R (2008). Substance use among medical students: time to reignite the debate? The National Medical Journal of India. 21(2):75-8.
- Unni JC (2009). Adolescent attitudes and relevance to family life education programs. Indian Pediatrics. 47(2):176-9.
- Saxena S (1999). Country profile on alcohol in India. In: Riley L, Marshall M (Eds). Alcohol and Public Health in 8 developing countries, World Health Organization, Geneva, 37-60.
- Isaac M (1998). Contemporary trends: India. In Grant M (Ed.). Alcohol and emerging markets: patterns, problems and responses. Taylor and Francis. 145-176.
- Gaunekar G, Patel V, Jacob KS, Vankar G, Mohan D, Rane A, et al (2004). Drinking patterns of hazardous drinkers: A multicenter study in India. In (Eds) Haworth A, Simpson R. Moonshine markets: issues in unrecorded alcohol beverage production and consumption. New York, Brunner-Routledge, 125-144.
- Narawane NM, Bhatia S, Abraham P, Sanghani S (1998). Consumption of country liquor and its relationship to alcohol liver disease in Mumbai. Journal of Association of Physicians of India. 46(6):510-513.

- Girish N, Kavita R, Gururaj G, Benegal V (2010). Alcohol use and implications for public health: patterns of use in four communities. Indian Journal of Community medicine. 35(2):238-244.
- Manickam LSS and Basil J (2006). Impact of Tsunami on alcohol abuse in costal Chennai, Tamil Nadu, India summary report by C-DOT, Chennai (Unpublished).
- The Hindu (2006a). Hangovers cost Bangalore corporates ` 47 crore, The Hindu Business online Friday, May 26, 2006, http//www.blonnet.com/2006/05/26/ stories/2006052602601000.htm. accessed on 18th December 2007.
- Nimma Gadda (1993). A pilot study of the social construction of the meaning attached to alcohol use: Perceptions from India. Substance Use and Misuse. 1999 34(2):251-67. PMID: 10069752.
- Anandhi S and Jeyarajan J (2006). Masculinity and domestic violence in a Tamil Nadu village, In Men, Masculinity and domestic violence in India. International Center for Research on Women (ICRW), accessed from http://www.icrw.org/docs/ DV_India_Report4_52002.pdf, on 9th May 2006.
- Weber (1996). The influence of acculturation on attitudes toward alcohol and alcohol use within the Punjabi community: an exploratory analysis. Substance Use and Misuse. 31(11-12):1715-32. PMID: 8908713.
- Rodgers A, Ezzati M, Van der Hoorn S, Lopez AD, Ruey-Bin L, Murray CJL, et al (2004). Distribution of major health risks: findings from the Global Burden of Disease study. PLoS Medicine. 1:44-55.
- Reddy S (2000). Burden of Non-communicable diseases in India, World Health Organization, South East Asia Regional office, workshop document.
- Thun MJ, Peto R, Lopez AD, Monaco JH, Henley SJ, Heath CW et al (1997). Alcohol consumption and mortality among middle aged and elderly US adults. The New England Journal of Medicine. 337:1705- 1714.
- Rehm J, Gutjahr E, Gmel G (2001a). Alcohol and allcause mortality: a pooled analysis. Contemporary Drug Problems, 28:337-361. 329.
- Rehm J, Greenfield TK, Rogers JD (2001b). Average volume of alcohol consumption, patterns of drinking, and all-cause mortality: results from the US National Alcohol Survey. American Journal of Epidemiology. 153(1):64-71. 330.

- Rehm J, Gmel G, Sempos CT, Trevisan M (2003). Alcohol-related morbidity and mortality. Alcohol Research and Health. 27(1):39 51. 331.
- Rehm J, Chisholm D, Room R, Lopez A D (2006a). Alcohol In Disease control priorities related to Mental, Neurological, Developmental and Substance abuse disorders. World Health Organization and Disease Control Priorities Project. http://www.dcp2.org/file/ 6 4 / W H O _ D C P P % 2 0 m e n t a l % 2 0 h e a l t h % 20book_final.pdf accessed on 19th December 2008. 332.
- Rehm J, Patra J, Popova S (2006b) Alcoholattributable mortality and potential years of life lost in Canada 2001: implications for prevention and policy. Addiction.101(3):373-84.
- Krishnan A, Shah B, Lal V, Shukla DK, Paul E, Kapoor SK (2008). Prevalence of risk factors for noncommunicable disease in a rural area of Faridabad district of Haryana. Indian Journal of Public Health. 52(3):117-24.
- BISP (2008b). Bengaluru Injury/Road traffic injury Surveillance Programme: A feasibility study. Public Health alert on alcohol. Bengaluru Injury Surveillance Collaborators group, Gururaj et al. National Institute of Mental Health and Neuro Sciences, Publication No. 68, Bengaluru, 2008.
- Bhatt (1998). Domestic violence and substance abuse. International journal of gynecology and obstetrics. 63 (Supplement 1):S25-31. PMID:10075209.
- Gill JS, Shipley MJ, Tsementzis SA, Hornby RS, Gill SK, Hitchcock ER, et al (1991). Alcohol consumption - a risk factor for hemorrhagic and non-hemorrhagic stroke. American Journal of Medicine. 90:489-97.
- Hart C, Davey Smith G, Hole D, Hawthorne V (1999). Alcohol consumption and mortality from all causes, coronary heart disease, and stroke: results from a prospective cohort study of Scottish men with 21 years of follow up. British Medical Journal. 318:1725-29.
- Prospective Studies Collaboration (2002). Age-specific relevance of usual blood pressure to vascular mortality: a meta-analysis of individual data for one million adults in 61 prospective studies. The Lancet. 360:1903-13.
- Sugathan TN, Soman CR, Sankaranarayanan K (2008). Behavioral risk factors for non communicable diseases among adults in Kerala. India. Indian Journal of Medical Research. 127(6):555-63.

- Shah S, Vesuna P, Amin G (1996). Psychological sequelae of alcohol dependents: a study of 100 cases. India Psychological review. 46(7-8):148-155.
- Green facts (2006). http://www.greenfacts.org/ alcohol/about-alcohol.htm#0, accessed on 10th June 2006.
- Vasu U, Vasnaik A, Bhattu RR, Kurian M, George S (2001). Occupational globe injuries. Indian Journal of Ophthalmology. 49(1):43-7.
- Erik Blas, Johannes Sommerfeld and Anand Sivasankara Kurup. 2010. Social determinants approaches to public health: from concept to practice. WHO. Available from http://www.who.int/social_determinants.