How responsible is responsible drinking:
An evidence based review

Anindya Banerjee, Debasish Basu, Anil Malhotra

Abstract : *Responsible drinking refers to drinking of alcoholic beverages at a level that is unlikely to lead to health problems. The liquor industry has promoted responsible drinking as a policy for its putative health benefits. Guidelines for responsible drinking are available in several countries. Alcohol at lower levels is associated with reduced mortality and morbidity from coronary artery disease but higher levels and binge pattern increases mortality manifold, indicating a J-shaped relationship. There are many caveats to accepting responsible drinking as a public health policy. Unlike heart disease, the risk for several medical conditions and psychosocial complications follow a linear relationship with intake of alcohol. Responsible drinking at the individual level may increase alcohol consumption at the community level, resulting in greater alcohol related damage. In conclusion, currently there is not enough evidence to promote drinking of alcoholic beverages, even at so-called 'responsible' levels, from a public health and policy perspective.*

Key Words: *responsible drinking, sensible drinking, low risk drinking, controlled drinking, alcohol policy*

Alcoholic beverages ("alcohol" for the rest of the paper), since times immemorial, have been a subject of eulogy and condemnation; a harbinger of agony as well as ecstasy; a symbol of glory and ignominy. It has cut across the barriers of time and space, and has been held responsible for the fall of the Roman Empire and death of Alexander the great.[1] Alcohol continues to influence health and sociocultural milieu throughout the world and the tremendous global impact is borne out by the sheer volume of research on alcohol.

Policies governing alcohol use have wavered from prohibition to free trade and neither seems perfect. Prohibition, used as a policy, has only succeeded in spurring illicit trade, whereas totally unrestricted and unconditional access to alcohol has led to increased consumption with its associated hazards. In this background, the concept of controlled drinking originated in late 1950's and early 1960's as a harm reduction measure. However, the light of new evidence showed that moderate drinking could actually be beneficial to health. Hence in the 1970's and 1980's there was a flurry of activity to promote an alcohol policy that supports drinking in moderation. This has been variously called 'Sensible' or 'Responsible' drinking.

METHODS

The search strategies for this review included both search of electronic databases as well as manual search of relevant publications or cross references. Electronic search included PUBMED as well as other databases and relevant websites on the Internet through popular search engines like Google. Cross searches of key references

(both manual and electronic) also yielded additional material.

TERMINOLOGY

Responsible drinking is the use of alcoholic beverages by an individual in such a way that it does not lead to damage for that person.[2] An alternative and more appropriate definition is: 'level at which drinking is unlikely to cause health problems'.[3]

'Sensible Drinking' means drinking enjoyably, sociably and responsibly. It includes not drinking at all when the effects of alcohol will put someone's safety or health at risk. It also means being aware of the risks of young people and special groups of drinking alcohol.

Moderate drinking has been defined by Department of Health, USA as the level of drinking that poses a low risk of alcohol related problems both for the drinker and for others.

Over the years, all the above terms have been used interchangeably in the scientific literature. Due to lack of objectivity and well-defined indicators of safety, the term 'low risk' drinking is preferred now.

Guidelines for responsible drinking

The guidelines for responsible low risk drinking (as opposed to hazardous/ harmful form) are shown in Table 1, the limit being 3 units/day or 21 units/week for males and 2 units per day or 14 units/ week for females where a unit is 8 grams or 10 ml of pure alcohol. This is equivalent to half a pint of ordinary strength beer at 3.5% alcohol by volume (ABV), a small glass of wine at 9% ABV or 25 ml of spirits at 40% ABV.

The World Health Organization (WHO) guidelines were criticized for not giving due importance to patterns of drinking and not indicating the groups who should refrain from drinking. This led to shift in paradigm from weekly

Table 1
Responsible Drinking Guidelines

Responsible or low risk : Level at which drinking is unlikely to cause health problems	**MEN** 3 units per day, with a maximum of 21 units per week spread throughout the week (including at least 2 alcohol free days per week)
	WOMEN 2 units per day with a maximum of 14 units per week spread throughout the week (including at least 2 alcohol -free days per week)
Hazardous or increased risk : Level at which there is an increasing risk of problems such as raised blood pressure, stroke, liver cirrhosis	**MEN** 3-7 units per day, or 22 - 49 units/week
	WOMEN 2-5 units per day, or from 15 -35 units/week
Harmful or definitely dangerous : Sustained drinking at this level is likely to cause physical, mental, social problems	**MEN** 7+ units per day, or 50+ units per week
	WOMEN 5+ units per day, or 35+ units per week

Table 2
Daily Safe Drinking Guidelines

	Male	**Female**	**Unit Definition**
UK Govt. (1995)[4]	3-4 Units of 8G	2-3 Unit of 8G	I Unit = ½ pint of beer = Small glass of wine (9% ABV) = 25 ml spirit (40% ABV)
US Govt.	Two drinks	One drink	1 unit = one drink = 12 ounces of beer (150 Cal) = 5 ounces of wine (100 Cal) = 1.5 ounce of sprit (100 Cal)

to daily guidelines, which is exemplified in the alcohol policies of British and American governments (Table-2). The policies clearly spell out that refraining on one day should not mean excess on another and indicates the special groups who need to abstain/ minimize use – which includes persons with past of family history of alcohol dependence, women who are pregnant or plan to conceive, persons on medications that may interact with alcohol. The guidelines given by American Council for Science and Health dissuade the following acts while under influence of alcohol -drinking operating heavy machinery, electrical equipment, working at heights, swimming, boating, driving, and skiing. It also discourages drinking before sports, while on certain medications and binge drinking (more than 5 Units / day).

RESPONSIBLE DRINKING -   WHAT IS THE DEBATE ALL ABOUT ?

The proponents of Responsible drinking argue that its promotion as a policy will lead to the reduction in the consumption levels of high risk drinkers thus reducing alcohol related mortality and morbidity. In fact they have urged to pass on the benefits of responsible drinking to the alcohol naïve population (in terms of reduced cardiac mortality etc.).

The opponents opine that promoting a universal policy will not deter the high risk drinkers but, on the contrary, may in fact encourage the teetotalers to drink, resulting in an increased per capita consumption that is well correlated with alcohol related mortality and morbidity; specially social, psychological and economic impacts. The evidence is now clear that countries with higher per capita alcohol consumption have higher rates of alcohol harm and countries with lower per capita alcohol consumption have lower rates of harm.[5]

Movement for responsible drinking - the impetus

The concepts regarding alcoholism and its management have undergone substantial changes in the past few decades. The true impetus was provided by the epidemiological studies in 1970's and 1980's, which suggested a protective action of drinking on coronary heart disease. The movement garnered further drive from the vigorous promotional campaigns that followed in the mass media of industrialized countries, urging the population to 'drink for health'. Media headlines like 'Raise your glasses to a longer life', 'To be taken with every meal' were rife and omnipresent in the newspapers of U.K. [6]

The impact of the mass media and strong lobbying by the beverage industry catapulted the situation into what was to become an 'alcohol policy' where 'Responsible' or 'Sensible drinking' was recognized and covertly encouraged by the policy makers.

Apart from effects of alcohol on health, the alcohol industry has taken the initiative to form a 'partnership' between the industry, the policy makers, and the health sector to "recognize the diversity of views surrounding alcohol and assist people to make their own judgments."

The International Center Alcohol Policies (ICAP) was established in 1995, with Marcus Grant as its founder president. With healthy support from the industry, it soon branched out and the Indian affiliate, Society for Alcohol related social polices (SASPI) was formed 1999 with the aim "to let key stake holders to work together to prevent and reduce alcohol related harm while achieving their independent objectives." Praise for the initiative has been effusive from certain quarters including some health professionals. The fallout has been several conferences and global charters which envisage the ideological union of the alcohol industry, health professionals and government.

Table 3
Evidence for potential benefits of modernate drinking and cardovascular diseases.

(Author)	Study	Conclusion	Comments
Farchi, G. et al., 1992 (Italian Rural Cohort of Seven Countries study)7	15 yr F/U of men age 45-64 yrs; n = 1536.	J-shaped relationship between alcohol and both overall & CV mortality after adjusting age, occupation and smoking	Results not significant if past cardiovascular patients are excluded
Perry I.J. et al. 19958	Prospective study of risk of NIDDM in men aged 40-59; n=7735	Moderate drinkers are at lower risk of CAD compared to abstainers, non-drinkers and heavy drinkers.	
Skog O-j. et al., 1996 (Oslo, Norway)9	Review	Evidence for J-curve hypothesis neither good enough to predict "safe limits" nor doe s it allow precise location of the "optimum" consumption level.	What is optimum for an individual is too much for population
Yuann J M et al. 1996 (Shanghai, China)[10]	3 yr F/U of men aged 45-64 for all cause mortality n = 18 244	Regular consumption of small amounts of alcohol (<28U /wk) associated with reduced mortality (19%) & IHD deaths (36%)	No effect on death from stroke. Not modified by type of drink.
Thun MJ, et al. 1997 (Atlanta, US)[11]	9 yr F/U of middle aged n =490000	Moderate alcohol consumption slightly reduced overall mortality	Benefit in overall mortality depended in part on age and background cardiovascular risk. Benefit was far smaller compared to increased risk in smoking or heavy drinking
Shaper & Wannamethee 1998 (London ,UK)[12]	Review	Light/ Non drinkers (both ex drinkers and lifelong teetotalers) show increased prevalence of conditions. leading to greater morbidity & mortality compared to occasional drinkers	Association with degree of protection is exaggerated due to bias. Message should emphasize harm of heavy drinking rather than possible benefits of light drinking
Corrao G et al. 1999[13]	Meta analysis of 200 studies to explore dose relationship between consumption and related conditions	High risk for cirrhosis, neoplasm of URT/ UGI, hemorrhagic stroke & accidents, Low risk for hypertension, neoplasm of liver& breast, chronic pancreatitis. For all conditions, low intake (25g/d) has shown significant risk	CAD not mentioned

....contd.

Table 3

Hart CL et al. 1999 (Glasgow, Scotland)[14]	21 yrs F/U study of men aged 35-64 , for mortality related to all causes n=5766	The overall mortality is unfavourable at greater than 22U/ week. No clear evidence of protection for men drinking less than this amount.	
Tsugane et al. 1999 (Chiba, Japan)[15]	7Yr F/U study; men 40-59yrs; n=19,231	Moderate alcohol is associated with lowest risks of all cause mortality especially in non-smokers.	
Puddey I.B. et al. 1999 (WA, Australia)[16]	Review	There is an established inverse relation between regular light alcohol (5-10g/d) and atheroma (CAD and ischaemic strokes) but linear with binges	Exploration of protective function must consider pattern of drink
White, I.R. 1999 (UK)[17]	Review of 20 cohort studies to find level of alcohol in units per week associated with least mortality (n= 60 224 men + 74824 women)	U.S. Men (7.7, 95% C.I. 6.4-9.1) U.S. women (2.9,95%, C.I. 2.0-4.0) U.K. men (12.9,95% C.I. 10.8-15.1)	
Sasaki S. 2000 (Kashiwa, Japan)[18]	Review	Since small and limited to light drinkers, general increase of consumption at population level is not recommended	The reduction in mortality is explained by reduction in CAD & ischaemic stroke mortality.
Murray R.P. et al. 2002 (Winnipeg, Canada)[19]	8 Yr F/U study n=1152 ; age 18- 64	Binge drinking increased risk of CHD in both men (RR=2.26) & women (RR=1.10) and HTN in men only (RR=1.57). In contrast, moderate drinking had cardio protective effects in both sexes.	
Mukamal et al. 2003[20]	Case control study n=273. >= 65 yrs	Compared with abstention 1-6 drinks weekly is associated with lower risk of dementia. Odds=0.46 (95% CI® 0.27-0.77)	Odds increased to 1.22 (0.60-2.49) with 14 or more drinks
Sempos CT et al. 2003 (,Buffalo)[21]	19 yr F/U study of African Americans; n= 2054	No beneficial effect of moderate drinking at any levels. Mortality increase with increase average intake > 1 drink/day	Reason may be detrimental drinking patterns

Reynolds et al. 2003, (LA,USA)[22]	Meta analysis of 35 studies	Heavy alcohol consumption increases RR ; light or moderate alcohol maybe protective against total & ischaemic stroke	Linear relationship between alcohol consumption and hemorrhagic stroke
Britton A, Marmot M., 2004[23]	Prospective cohort study with median follow-up of 11 years. n=10,308 (33% female); age 35-55 at baseline	A U-shaped relationship was found between volume of alcohol consumed per week and Coronary heart disease and all-cause mortality. The optimal frequency of drinking was between once or twice a week and daily, after adjustment for average volume consumed per week	Epidemiological studies should collect information on frequency of drinking in addition to average volume consumed in order to inform sensible drinking advice

Review of the evidence

In the past two decades, several prospective studies have demonstrated the beneficial effect of moderate levels of drinking on overall mortality. The studies on moderate alcohol consumption and its association with cardio-vascular status are summarized in Table 3.

There is a 'J-shaped' relationship between alcohol and both overall and cardiovascular mortality after adjusting age, occupation and smoking.[7] Moderate drinkers are at lower risk of coronary artery disease (CAD) compared to abstainers, non-drinkers and heavy drinkers. Regular consumption of small amounts of alcohol (<28U /wk) is associated with reduced mortality up to 19 percent & ischaemic heart disease (IHD) deaths by 36 percent. A beneficial effect in ischaemic strokes was also instrumental in reducing mortality.[8]

In a recent prospective cohort study with a sample of 10,308 (33% female); age 35-55 at baseline and median follow-up of 11 years, a U-shaped relationship was seen between volume of alcohol consumed per week and coronary heart disease / all-cause mortality.[23]

The beneficial effect of alcohol is chiefly ascribed to reduction in cardiovascular mortality and morbidity. The mechanisms of cardio-vascular protection are two-fold: (1) Altering lipid profile: increased HDL Cholesterol, decreased LDL Cholesterol; and (2) Preventing clot formation by reduced platelet aggregation, apolipoprotein-A, fibrinogen, plasminogen and tissue type plasminogen activator antigen.[24,25]

However, not all researchers have found the proposed beneficial effect of drinking at low levels.[14, 21]

On the other hand, the verdict against drinking at higher levels and drinking in binges is unanimous, with increased risk of overall mortality including cardiovascular mortality, hypertension and hemorrhagic strokes along with cirrhosis, accidents, neoplasms, pancreatitis etc.[26, 27]

Another study reported that drinking 1-6 Units / week may be associated with lower risk of dementia.[19] However, the risk of dementia spirals with 14 units or more per week, which is well within prescribed limits of responsible drinking.

Other proposed benefits of moderate drinking include reduced risk of non insulin dependent diabetes mellitus (NIDDM), perhaps by one third [28] lower risk of gallstones[29], reduced risk of Rheumatoid Arthritis in women (but not in men) [30] and reduced peptic ulcer risk mediated by anti-H. pylori action.[31] There are anecdotal reports of benefits in a variety of other conditions like kidney

stones, age-related macular degeneration, osteoporosis and some cancers.[32]

Limitations of the evidence

As mentioned above, the so-called 'U' or 'J' shaped curves have not always been replicated. Moreover, the studies that have found evidence of these curves have been criticized under several grounds.[6,9, 33-42]

Firstly, there may be selection bias in the form of a control group where people are abstaining due to an already compromised health status or they have quit alcohol following some years of use due to health and/or social problems- the so called "unhealthy abstainers". All social classes have not been properly represented in most studies. Most studies are on specific age groups, specifically middle-aged males who are at maximum risk for CAD, which erroneously magnifies the benefits. Moreover, there is paucity of data from countries with low CAD prevalence. The two quoted studies from Asia have follow up durations of three years and seven years, which is inadequate for evaluating the long-term effects of alcohol. [10, 15]

There are no longitudinal studies to establish the safety of 'responsible drinking' limit on the psychosocial and economic impacts. Evidence for J-curve hypothesis is neither good enough to predict "safe limits" nor does it allow precise location of the "optimum" consumption level.[9] No trial has yet assessed if increased problem drinking will overweigh the benefits of CAD mortality if regular drinking of small amounts were advocated for population subgroups.

Advocates of responsible drinking do not consider the issue of responsibility in a larger social sense. They neglect the fact that there is a wide disparity between levels of consumption that is not apt to lead to damage for the individual and an average level of consumption for a society, which, if achieved, would likely result in high rates of alcohol related damage.[2]

Finally, there are no longitudinal studies to predict who would start drinking, who would maintain light to moderate drinking and who would progress to hazardous drinking. Most studies do not meet the rigorous criteria required for adequate evaluation and, among the few who come close[14], linear (rather than J shaped) associations are often found.[35]

Can "Responsible drinking" be harmful?

It is well accepted that beyond small quantities, risks of alcohol consumption outweigh benefits many times. Even within the so called responsible limits, benefits have no impact in men less than 35 years and pre menopausal women or in societies with low coronary artery disease prevalence. There are other effective and safer measures of CAD risk reduction like exercise, and low fat diet, aspirin and smoking cessation.[36]

For many conditions, like cancers and psychosocial complications like accidents, risk vis-à-vis alcohol use lies in a continuum. In a recent time-series analysis of over 50 years in Canada, an increase in per capita consumption of alcohol by one liter was accompanied by increase in accident mortality of 5.9 among males and 1.9 among females per 100000 inhabitants .[43]

One fifth of North American men on three drinks a day (arguably responsible drinkers) meet ICD-10 criteria for alcohol dependence.[44] At the level of 2.5 drinks a day, 25% of the population experience two or more adverse consequences per year in life areas such as friendships, happiness, health, home life, work, studies, and employment.[45]

Failure to consider body weight and individual vulnerability, style, pattern and spacing of drink and drinking context can lead to a gross error in estimation of the risks or benefits of drinking. There is ample evidence that even occasional binges

can be potentially dangerous.

Knowledge regarding 'responsible' limits is often not translated to change in attitude. Moreover, a change in attitude towards alcohol does not automatically translate into a change in drinking behaviour. After the release of the British Medical Association guidelines on limits of 'sensible drinking' street surveys conducted by medical students in London indicated that the people who were high-risk drinkers were paradoxically more aware of the limits of sensible drinking.[46,47] In addition, none of the high-risk drinkers intended to reduce their intake as per the guidelines.[36]

While studying the impact of a 10-year nation-wide campaign on knowledge of sensible drinking limits in Denmark, subjects admitting an intake higher than sensible for own sex, i.e. 21 and 14 drinks per week, respectively, had the highest knowledge of these drinking limits.[48]

Advertisements and Alcohol

The advertisements in this field have raised various concerns, as they are strategically designed to fire the imagination of the youth. The brief message due to time constraints leads to little if any contextualisation, and is subject to misinterpretation by the audience. The 'sensible' or 'responsible' part of the message is often lost in the glamorous maze of the other aspects of the advertisements.[49]

In his assessment of beer advertisements, Dejong et al[50] concluded that brewers' prevailing interest often ignore that some people should not drink at all, drinking and certain acts do not go together and the moderation message is often dominated by glamorous presentation of alcohol consumption. Corporate sponsors are less likely to mention threats or negative consequences than non-profit organizations.

Advertising bans have not been shown to be effective in reducing alcohol consumption. This is largely due to the innovative surrogate advertising carried out by liquor barons. They have a strong presence in all spheres of life including sports, fashion, and entertainment. Saffer[51] recommends that counter advertising rather than new advertising bans would be more suitable as a public policy and an important area of future research is the identification of counter advertising themes most effective with the youth.

Alcohol Policy - Why is it required?

The rationale for having an alcohol policy has been amply summarized by Edwards et al. (1994) in their seminal book, Alcohol Policy and Public Good.[33]

To start with, alcohol related problems are pervasive and enormously costly for the state. Apart from this, drinking problems change with time, which demands a flexible, periodically revised policy addressing the changing demands of society, culture and economy. Lastly, quantities drunk and problems are related. Population studies suggest that one-liter increase in per capita consumption leads to 1% increase in mortality. There is significant relationship between population consumption level and mortality from cirrhosis, pancreatitis, certain cancers, traffic fatalities and suicide. Hence a reduction in consumption can bring about significant decrease in alcohol related mortality in populations.

Strategies to control alcohol consumption

The measures of proven efficacy to control alcohol consumption in general populations include taxation, environmental measures like enforcement of a minimum legal drinking age; restriction on hours and days of sale, number of outlets and drink driving countermeasures which may range from fines to imprisonment.[6, 33]

Another approach, albeit an old one, is treatment for those who need it. The concept of alcoholism as a disease has been revisited

several times, but there is no doubt that some form of treatment must be offered to the problem drinkers. It is important that this treatment is accessible, acceptable and affordable. This can be best ensured by integrating it with existing channels of primary health care.[5, 32]

Responsible drinking as a national policy: Implications

As of now, there is no evidence that the concept of responsible drinking per se affects per capita consumption or that the guidelines affect attitude, pattern or context of drinking. There is no unequivocal research evidence to support the efficacy or effectiveness of educational campaigns or advertising restrictions on per capita consumption.

As already discussed, knowledge, attitude and practice do not always go hand in hand as far as drinking is concerned. Hence the idea that the concept of responsible drinking and its propaganda will lower the consumption of high-risk drinkers does not appear realistic.

The British Medical Association (BMA) guidelines4 do not imply that there is an optimum intake for health benefits and reduced risk. Drinking up to the stated limits is low risk, drinking nothing may present a slightly higher risk in terms of CAD but at the same time individuals are not exposing themselves or society to any of the other harms of alcohol; and the risk increases with the amount consumed.

Drinking at even upper end of the lower risk levels place individuals at risk for dependence. Almost all persons meeting dependence criteria were initially "responsible "or social drinkers.

It has been emphasized by several researchers that no clear threshold of safe drinking exists. There is a clear danger that talking about a "safe limit" will encourage wider population drinking and spur light drinkers to drink up to the stated limit. There is also growing concern that globally promoted 'sensible drinking' messages will increase accidents, work injuries, absenteeism, productivity losses, crime, violence, disrupted families, suicide, and risky sexual behavior.[6]

CONCLUSION

As far as benefits for CAD and ischaemic stroke are concerned "evidence is conclusive at the level of association, highly suggestive at the level of causation, but not significant at the policy level".[52]

Upper level of the guidelines for 'sensible or responsible drinking' represents lower risk rather than safe drinking. Promotion of alcohol as "the heart medicine" is more likely to add only to the health of liquor industry and not the public. The health professionals have a moral duty to prevent the misrepresentation of facts and evidence by the alcohol industry. Drinking for health must be discouraged and any efforts to implement such policies must be nipped in the bud. 'Responsible drinking' may provide some circumscribed health benefits in carefully selected individual cases but socio-economic and psychological concerns at a macro-level preclude it from being prescribed as a health measure or promoted as a public health policy.

In conclusion, currently there is not enough evidence to promote drinking of alcoholic beverages, even at so-called 'responsible' levels, from a public health and policy perspective.

REFERENCES

1. Liappas JA, Lascaratos J, Fafouti S et al. Alexander the Great's relationship with alcohol. *Addiction* 2003; 98: 561-7.

2. Whitehead PC. Public policy and alcohol related damage: media campaigns or social controls. *Addict Behav* 1979; 4:83-9.

3. Andrews G, Jenkins R. Management of Mental Disorders. World Health Organisation Collaboration Center for Mental Health and Substance Abuse; 1999.

4. British Medical Association. Alcohol: guidelines on sensible drinking. London: BMA; 1995.

5. Holder H. Editorial: population drinking and alcohol harm: what these Canadian analyses tell us. *Addiction* 2003; 98: 865-6.

6. Casswell S. Population level policies on alcohol: are they still appropriate given that "alcohol is good for the heart"? *Addiction* 1997; 92 (Suppl 1): S81-90.

7. Farchi G, Fidanza F, Mariotti S et al. Alcohol and mortality in the Italian rural cohorts of the Seven Countries Study. *Int J Epidemiol* 1992; 29:667-71.

8. Perry IJ, Wannamethee SG, Walker MK et al. Prospective study of risk factors for development of non-insulin dependent diabetes in middle aged British men. *BMJ* 1995; 310: 560-4.

9. Skog O-J. Public health consequences of the J-curve hypothesis of alcohol problems. *Addiction* 1996; 91: 325-37.

10. Yuan JM, Ross RK, Gao YT et al. Follow up study of moderate alcohol intake and mortality among middle aged men in Shanghai, China. *BMJ* 1997; 314:18-23.

11. Thun J, Peto R , Lopez AD et al. Alcohol consumption and mortality among middle aged and elderly U.S. adults. *New Engl J Med* 1997; 337:1705-14.

12. Shaper AG ,Wannamethee SG. The J-shaped curve and changes in drinking habit. Novartis Found Symp. 1998; 216:173-88.

13. Corrao G, Bagnardi V, Zambon A et al. Exploring the dose relationship between alcohol consumption and the risk of several alcohol-related conditions: a meta analysis. *Addiction* 1999; 94: 1551-73.

14. Hart CL, Davey Smith G, Hole DJ et al. 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. *BMJ* 1999; 318: 1725-9.

15. Tsugane S, Fahey MT, Sasaki S et al. Alcohol consumption and all cause and cancer mortality among middle aged Japanese men, seven year follow up study of the JPHC study Cohort I. Japan Public Health Center. *Am J Epidemiol* 1999;150 :1201-7.

16. Puddey IB , Rakic V, Dimmitt SB et al. Influence of pattern of drinking on cardiovascular disease and cardiovascular risk factors—a review. *Addiction* 1999; 94: 649-63.

17. White IR. The level of alcohol consumption at which all-cause mortality is least. *J Clin Epidemiol* 1999; 52: 967-75.

18. Sasaki S. Alcohol and its relationship to all-cause and cardiovascular mortality. *Acta Cardiol* 2000; 55:151-6.

19. Murray RP, Connett JE, Tyas SL et al. Alcohol volume, drinking pattern, and cardiovascular disease morbidity and mortality: is there a U-shaped function? *Am J Epidemiol* 2002; 155: 242-8.

20. Mukamal K, Kuller L, Fitzpatrick A et al. Prospective study of alcohol consumption and risk of dementia in older adults. *JAMA* 2003; 289:1405-13.

21. Sempos CT, Rehm J, Wu T et al. Average volume of alcohol consumption and all cause mortality in African Americans: the NHEFS cohort. *Alcohol Clin Exp Res* 2003; 27:88-92.

22. Reynolds K, Lewis B, Nolen JD et al. Alcohol consumption and risk of stroke: a meta-analysis. *JAMA* 2003; 289: 579-88.

23. Britton A, Marmot M. Different measures of alcohol consumption and risk of coronary heart disease and all-cause mortality: 11 year follow up of the Whitehall II Cohort Study. *Addiction* 2004; 99: 109-116.

24. Agarwal DP. Cardioprotective effects of light-moderate consumption of alcohol: a review of putative mechanisms. *Alcohol Alcohol* 2002; 37:409-15.

25. Agarwal DP, Srivastava LM. Does moderate alcohol intake protect against coronary heart disease? *Indian Heart J.* 2001; 53:224-30.

26. Single E , Robson L, Rehm J et al. Morbidity and mortality attributable to alcohol, tobacco and illicit drug use in Canada. *Am J Public Health* 1999; 89:385-90.

27. English DR, Holman CDJ, Milne E et al. The quantification of drug caused morbidity and mortality in Australia. Commonwealth Department of Human Services and Health, Canberra: Commonwealth Department of Human Services and Health; 1995.

28. Rimm EB, Chan J, Stampfer MJ et al. Prospective study of cigarette smoking, alcohol use and the risk of diabetes in middle aged British men. *BMJ* 1995; 310: 555-9.

29. Martinez de PC, Carballo F, Horcajo P et al. Prevalence and associated factors for gallstone disease: results of a population survey in Spain. *J Clin Epidemiol* 1997; 50: 1347-55.

30. Voigt LF, Koepsell TD , Nelson JL et al. Smoking , obesity, alcohol consumption and the risk of rheumatoid arthritis. *Epidemiol* 1994; 5:525-32.

31. Brenner H, Rothenbacher D, Bode G et al. Relation of smoking and alcohol and coffee consumption on active Helicobacter pylori infection: cross sectional study. *BMJ* 1997; 315: 1489-92.

32. de Lorimier AA. Alcohol, wine and health. *Am J Surg* 2000; 180: 357-61.

33. Edwards, G., Anderson, P., Babor, T.F. et al. Alcohol policy and the public good. Oxford University Press: Oxford.; 1994

34. Inter-Departmental Working Group. Sensible drinking. London: Department of Health; 1995.

35. Fillmore KM. Is alcohol really good for the heart? *Addiction* 2000; 95: 173-4.

36. Emblad H. What would happen in the world if "sensible drinking" was adopted as a reasonable concept and advertised universally? *Addiction* 1995; 90: 169-171.

37. Hawks D. How to profit from sensible drinking. *Addiction* 1994; 89: 351.

38. Le Fanu J. Sensible drinking. Civil servants should be congratulated for rejecting "whole population theory". *BMJ* 1996; 312: 507.

39. Paton A. (1999) Reflections on alcohol and the young. *Alcohol Alcohol* 1999; 34: 502-5.

40. Podger GJ. Sensible drinking. Government's recommendations should be considered as a whole. *BMJ* 1996; 312: 506.

41. Thakker KD. An overview of health risks and benefits of alcohol consumption. *Alcohol Clin Exp Res* 1998; 22 (Suppl):S285-98.

42. Bondy SJ, Rehm J, Ashley MJ et al. Low-risk drinking guidelines: the scientific evidence. *Can J Public Health* 1999; 90: 264-70.

43. Skog O-J . Alcohol Consumption and fatal accidents in Canada 1950-98. *Addiction* 2003; 98: 883-93.

44. Midanik L. Alcohol consumption and consequences of drinking in general population surveys. In: (eds. Holder & Edwards), The scientific rationale for alcohol policy. Oxford University Press: Oxford; 1995.

45. Room R, Bondy SJ, Ferris J. The risk of harm to oneself from drinking, Canada 1989. *Addiction* 1995; 90: 499-513.

46. Bayliss L., Connolly S, Flint, R et al. Sensible drinking ... or elsewhere. *BMJ* 1996; 312:507

47. Kessaris N, Greasley LA, Horner DR et al. Sensible drinking. Few people will change their drinking habits in London ... *BMJ* 1996; 312: 506-7.

48. Gronbaek M, Stroger U, Strunge H et al. Impact of a 10-year nation-wide alcohol campaign on knowledge of sensible drinking limits in Denmark. *Eur J Epidemiol* 2001; 17: 423-7.

49. Casswell S. Does alcohol advertising have an impact on the public health? *Drug Alcohol Rev* 1995;14:395-403

50. DeJong W, Atkin CK, Wallack LA. Critical analysis of "moderation" advertising sponsored by the beer industry: Are "responsible drinking" commercials done responsibly? Milbank Q 1992; 70: 661-678.

51. Saffer H. Alcohol advertising and youth. *J Stud Alcohol* 2002; (Suppl.):173-81.

52. Edwards G. (1996) Sensible drinking. *BMJ* 1996; 312: 1.

Anindya Banerjee, Senior Resident
Debasish Basu, Additional Professor
Anil Malhotra, Professor
Department of Psychiatry,
Post Graduate Institute of Medical Education & Research, Chandigarh.

Corresponding Address :

Dr D. Basu
Department of Psychiatry,
PGIMER, Chandigarh 160012.
E-mail: db_sm2002@yahoo.com