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SURVEYS OF DRINKING PATTERNS AND PROBLEMS IN SEVEN DEVELOPING COUNTRIES

World Health Organization

Department of Mental Health and Substance Dependence

WHO Monograph on Alcohol Epidemiology in Developing Countries

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Department of Mental Health and Substance Dependence

Disclaimer

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INTRODUCTION

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Survey research on drinking in developing societies

Though earlier examples can be found, the modern tradition of survey research on drinking patterns and problems in general populations is a product of the second half of the 20th century. By the mid-1970s, surveys of adult drinking behaviour had been carried out in at least 10 European and English-speaking countries (Room, forthcoming-b). By 2000, such studies have been carried out in most other developed countries; indeed, many countries have established a tradition of repeated surveys, allowing trends and developments to be monitored in the whole society and in subgroups of the population. Such studies typically include detailed questions about amounts and patterns of drinking and often about contexts of drinking. Often, questions are also asked about the respondent's experience of problems related to drinking, as well as questions from measures for screening or diagnosis of alcohol dependence and other disorders (Room, forthcoming-a).

Such surveys have contributed important information on the demography of drinking – where different patterns of drinking (or abstention) are distributed by subgroups of the population formed by differentiations such as gender, age, socio-economic status, and region of residence. They have become a way of gathering information on alcohol consumption not recorded in official statistics (e.g., Österberg, 2000). They have also given a picture at the population level of the extent and distribution of alcohol-related problems – a broader picture than can be gained by statistics on cases in treatment systems or police activity. As a society builds up a tradition of such surveys, they also become tools for monitoring trends in different social groups, and sometimes for evaluating the effects of policy interventions in the society (e.g., O'Malley and Wagenaar, 1991). They thus become an important tool for alcohol policymaking in a public health perspective.

Survey research on drinking patterns and problems in developing societies has been much less common. The Mexican tradition, already established in the 1970s, is a clear exception (Medina Mora and Borges, forthcoming). Other developing societies with relatively well developed traditions of such research include Costa Rica (Miguez, 1983) and India (Singh, 1989). Otherwise, there have been single surveys in a number of countries, including the Nigerian and Namibian surveys included in this monograph. Also relevant here are surveys which have been carried out in what has been called the "fourth world" – surveys of aboriginal minorities within developed countries (e.g., Hunter et al., 1991; Klausner and Foulks, 1982).

Alongside the tradition of surveys dedicated specifically to alcohol have been surveys carried out for other or broader purposes, which have included some questions about drinking. The Mexican and Indian survey traditions actually straddle this divide: while the international political dynamics which resulted in and often financed the surveys were focused on illicit drugs, national researchers in Mexico and India steadfastly insisted that substantial questioning on alcohol be included too, in view of the substantial health and social problems related to drinking. Alcohol questions have also been included in general-population surveys with a variety of other topical emphases besides illicit drugs: e.g., psychiatric epidemiology, tobacco smoking, psychoactive medications and nutrition. As an example, nutrition was the primary focus of the Seychelles study analysed in this book. Increasingly, general medical epidemiological surveys have also been including questions about drinking, although the particular questions included are often problematic for describing drinking patterns (Rehm, 1998).

Reasons to undertake surveys on drinking in developing societies

Survey research on drinking practices and problems is of course not the only approach to collecting data relevant to alcohol policy and programming in developing societies. At least limited data on production and consumption of commercial alcohol beverages, and on alcohol-related mortality, is available for nearly every country (WHO, 1999). There is a long tradition of ethnographic studies of drinking (Heath and Cooper, 1981; Heath, 1993; Marshall, 1979), and ethnographers have increasingly moved beyond describing drinking from

presumptively tradition-bound societies to studies set in the modern world of intercultural influences and major social changes (e.g., Eber, 1995; Marshall & Marshall, 1990; Colson and Scudder, 1988).

But survey data offer important advantages in a developing-country context. In the first place, there is a way to measure, however imperfectly, the alcohol consumption, which is not recorded in official statistics – which in many countries constitutes the greater part of alcohol consumption. Second, survey data can give a picture of the social location of drinking in a society, and also allows a direct focus on charting the distribution and correlates in the population of the patterns of drinking most likely to be associated with harm – intoxication episodes, and long-term heavy drinking. Third, a survey offers a way to measure directly alcohol-related problems, which do not show up in police or health statistics: problems in family life, for instance, or in work performance. Fourth, analyses of survey data can explore directly the relationship between patterns and contexts of drinking and the occurrence of social and health problems. Fifth, when surveys are repeated over time, they can be used to monitor the situation in the society and to evaluate policy initiatives.

The background of this manuscript

Analyses of surveys on drinking patterns and problems in developing countries have not been widely available. There are a variety of reasons for this. A full report on a survey study is a sizeable and unwieldy document, not suitable for publication as a journal article, so such reports tend to stay in the "grey literature" of reports from research institutes and groups. Also, for obvious reasons, the reports are published in the national language. Researchers have often not had the time or incentives to go on to a further stage of publishing articles on the results in internationally accessible journals. Furthermore, as we have noted, the alcohol items are often collected as a side issue in a survey mostly oriented in another direction, so that they have often had a lower priority in researchers' analysis strategies.

The present manuscript's aim is to start on a remedy for this situation, by putting together survey analyses from a variety of developing societies. It is an outgrowth of the project on Alcohol Policy in Developing Societies, initiated in 1996 by a group of scholars under the auspices of the World Health Organization (WHO). The central aim of the project was to produce a review of the available empirical data on drinking practices and problems in developing societies and on the diversity and effectiveness of treatment, prevention, policy and other societal responses to alcohol problems in such societies (Room et al., forthcoming). The work for the project looked in several directions in developing material for its review, starting with the compilation of a bibliography of relevant research (Ialomiteanu, 1998). One initiative was to develop a series of case studies on alcohol and public health particularly in developing countries (Riley and Marshall, 1999). A related WHO activity was the preparation of a *Global Status Report on Alcohol* (WHO, 1999), gathering and reporting available data for each country of the world on per-capita alcohol consumption, on alcohol-related morbidity and mortality, and on alcohol policies. A third initiative was to look for existing survey data from adult populations on drinking patterns and, where available, alcohol-related problems. The criteria for inclusion in this initiative were such the study include enough questions on drinking to analyse drinking patterns (frequency of drinking, drinking high quantity on an occasion, etc.), include interviews with at least 1000 adults from a defined population, identified for interview with similar probability sampling, and that the data was collected in 1988 or more recently.

Study directors of studies fitting these criteria were invited to prepare analyses of their data in accordance with a specified plan, to maximize comparability. At a meeting in Mexico City on 13-15 August 1998, hosted by the Mexican Institute of Psychiatry, the study directors and WHO staff and consultants met to discuss their drafts and prepare a plan for revising them for the present publication. At the meeting, Andrée Demers agreed that, with Chantal Bourgault, she would take on the task of editing the reports into the present manuscript. The report on Namibia was added after the Mexico City meeting.

The countries included in this manuscript

The availability of suitable data, and not any consideration of country size, world region, or level of development thus dictated the choice of countries for inclusion in this project. Happily, however, the countries included in this manuscript provide a good range of cases on all of these dimensions (Table 1). On size, they range from the most populated country (China) to a small island nation (Seychelles). In terms of WHO's regional groupings, Namibia, Nigeria and Seychelles are from the African Region; Costa Rica and Mexico from the Americas; India from the South-East Asian Region; and China from the Western Pacific Region. In terms of level of development, Costa Rica, Mexico and the Seychelles are classified among the 64 "high human development" countries in the 1998 *Human Development Report* (UNDP, 1998), China and Namibia are among the 66 "medium human development" countries, and India and Nigeria are among the 44 "low human development" countries. Overall, we may say that the range of included countries is characterised more by diversity than by commonality.

There is also wide variation between countries in the recorded per-capita alcohol consumption. To some extent, this probably reflects differences in the degree of unrecorded consumption. Nigeria's true consumption level, for instance, is undoubtedly considerably higher than the recorded level, although Nigeria includes a large abstemious Moslem population. India may well have the lowest actual alcohol consumption of the countries included in the manuscript, although India is nowhere near the bottom of the global range in terms of recorded consumption. The other five countries are all in the upper half of countries for which a consumption figure is available (WHO, 1999), although Costa Rica's reported consumption is less than half of the 11-15 litres per adult reported by the countries, mostly developed, at the top of the range globally (WHO, 1999). But as the survey data results, which follow demonstrate, in countries like Namibia and the Seychelles, the reported consumption may be only half the story.

Table 1

Some statistics on the countries from which studies are reported in this manuscript (all data are for 1995 unless indicated)

	POPULATION (MILLIONS, ROUNDED)	HUMAN DEVELOPMENT INDEX		LIFE EXPECTANCY AT BIRTH	ADULT LITERACY RATE (%)	RECORDED ADJUSTED REAL PER-CAPITA GDP	PER-ADULTA ALCOHOL CONSUMPTION 1996
		RANK	LEVEL				
Costa Rica	3	34	0.889	76.6	94.8	5969	5.72
Mexico	94	49	0.855	72.1	89.6	6046	5.04
China	1221	106	0.65	69.2	81.5	2935	5.39
India	935	139	0.451	61.6	52	1422	0.99
Seychelles	b0	56	0.845	72	88	6073	c4.84
Namibia	2	107	0.644	55.8	76	4054	d3.60
Nigeria	112	142	0.391	51.4	57.1	1270	0.66

a) Per adult = per person aged 15 and over
b) Population 73,000
c) 1989 data
d) Early 1990s, beer only
Sources: Alcohol consumption, population: WHO, 1999; all else: UNDP, 1998.

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Editors' biographies

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She is a post-doctoral fellow from the Medical Research Council, Canada (MRC) at Yale University School of Internal Medicine, New Haven (Connecticut). She completed her PhD at the Department of Epidemiology and Biostatistics, McGill University (Montreal), with specialization in pharmacoepidemiology. She has been associated with both the Health and Prevention Social Research Group (GRASP) and the Équipe de Recherche et d'intervention sur les substances psychoactives-Québec (RISQ) for a few years, during which she worked and published on social aspects of alcohol drinking.

Patterns of alcohol consumption and related problems in Mexico: Results from two general population surveys

MEXICO

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Background

Mexico is located in North America, bounding with the United States in the north and Guatemala and Belize in Central America to the south. It was constituted by the mixture of ethnic groups that inhabited the country before the XVth century and people from Spanish origin. The domination of the latter group for three centuries resulted in changes in the country's name, language and religion. Mexico kept important influences from these original cultures. In 1995, according to the most recent count of the population, there were 9.17 million Indians distributed throughout the country, who speak 81 different languages and dialects (Valdés, 1997).

Mexico is a highly populated country and although the proportion of young people is decreasing (from 43% in 1950 to an estimated proportion of 35% in the year 2000), it is still important in numbers. Indeed, it is estimated that for the year 2000, there will be in the country 36,449 millions of minors younger than 15 years. The proportion of older people is increasing (from 4% to 7% for the same period). The adult population will not increase their proportion in the society but will increase from 13,663 million in 1950 to 56,119 in the year 2000 (Frenk et al., 1994). Around 65% of the population live in urban regions of more than 2,500 inhabitants and are highly concentrated in three main metropolitan areas. The Capital City has an estimated population of 8.5 million and when the metropolitan area is included, of 20 million inhabitants.

The growth of the internal gross product is not equivalent to the increasing population that demands satisfaction of basic needs, education and working opportunities. Ten percent of the population aged 15 years and over has never attended school and an additional 21% did not finish the elementary level (1 to 6 years of education). These proportions are considerably lower in the Capital City where only 4% have never attended school and 10% did not finish elementary school. At the national level, only 27% of people aged 15 years and older have more than 9 years of formal education while in Mexico City, this proportion reaches 44%. 39% of the households in the country and 24% in Mexico City do not have sufficient earnings to support the very basic needs of the household (under 2 minimal wages).

Stemming from an extended family society, the nuclear composition has become the predominant family arrangement (74%), though in some localities, recomposed families have increased as a response to the economical crisis that has affected the quality of life of the population. The proportion of females as main support for the household is larger in Mexico City (21%) than what is observed in the country (17.8%). Households headed by females tend to be smaller and poorer. Recently, women's roles have changed dramatically: fertility rates have declined (from 7 in 1970 to 3.4 children per women in 1990), women are more often enrolled in formal education, the male/female ratio in secondary school levels (7-9 years of school completed) is almost equivalent and more women are economically active. Also, the proportion of females among the economic active population increased from 15.2% in 1970 to 29.2% in 1990 (INEGI, 1990, 1995).

Drinking patterns and customs

Types of beverages consumed. Before the Spanish Conquest, fermented beverages were consumed under clearly defined norms. The generalised pattern of use was communal drinking in rituals associated mainly to agriculture, religion and life cycles such as being born, getting married and dying (Taylor, 1979). Violation of norms was severely punished with rejection by society as a whole. After the Spanish domination, the rituals changed to indiscriminate and profane use of alcohol and distilled beverages were introduced. The previous occasions of ritual inebriation were extended to the numerous festivities in the catholic calendar. *Pulque*, the main fermented beverage, was extensively commercialised and there was an absence of laws or dispositions that limited alcohol abuse. Indian authorities lost their prestige and political liberty and as a consequence, the rigor in the prosecution of abuse diminished whereas no substitutive regulation was immediately imposed by the Spaniards (Rojas, 1942; Corcuera de Mancera, 1991).

Nowadays, the highest proportion of the alcohol produced refers to international brands beer occupying the first place (73%), followed by spirits

(23%), with very low production of table wines (1%) and of other industrialised and registered beverages (2%). In 1994, the total *per capita* intake was estimated to be 3.5 litres for the population aged 15 years and older, an increase of 62% when compared to that in 1970 (2.06 litres per capita) (Rosovsky & Borges, 1996).

Local fermented beverages consumed in the country before the Spanish Conquest in the XVIth century are still being used among indigenous groups, in rural populations and, in a smaller proportion, in urban sites. The most known, derived from a Mexican agave, "*pulque*" represents 9% of the alcohol consumed in urban sites (Medina-Mora *et al.*, 1991). *Pulque* is the beverage of preference among rural localities. The average weekly intake per household in these areas has been estimated to be 6.4 litres as compared to only 3.7 litres of beer (INEGI, 1994).

New types of beverages have recently appeared in the market. These include "*coolers*", prepared cocktails and canned beverages that combine rum and coke. It has been estimated that these products are consumed by 11% of the urban population aged between 12 and 18 years and by 9% in the 19 to 65 years age group (Secretarìa de Salud, 1993).

Although the amount that unregistered beverages, for which no taxes are paid, represent in the alcohol market is not known, some data suggest that they have an important place in the overall consumption, especially among disadvantaged people.

Population surveys have traditionally inquired about the consumption of 96° alcohol as an alcoholic beverage and of "*aguardientes*", that group local beverages with high concentrations of alcohol, part of which presumably not being registered. The National Survey on Addictions in 1991 estimated that 0.5% of the urban population of the country drank "*aguardientes*" or 96° alcohol (Medina-Mora *et al.*, 1991). Studies that have compared rural and urban populations in a region located in the central part of the country have estimated a 20% prevalence in rural communities as compared to 5% in urban sites (Medina-Mora, 1993).

Changes of patterns of drinking in recent history are related to the incorporation of females and the younger sectors of society to the drinking culture. Traditional double standards state that males might drink and even eventually get drunk but females should abstain. Despite the fact that both males and females of all ages have supported these standards, recent trends suggest an increase in the participation of females, and among them, the youngest and more educated (Medina-Mora, 1993).

Another important trend is the incorporation of the younger sector of the population to the drinking culture. Student surveys conducted among high school students report that around half of the country's high-school students have consumed alcoholic beverages in one or more occasions of their life, one third drank during the last 12 months and 15% during last month. 4% of young men and 1% of females drink 5 drinks or more per consuming session, once or twice a week (Medina-Mora *et al.*, 1991).

The 1986 and 1991 National School Surveys report no variation in the rates of alcohol use among urban students, 57% and 50% respectively reported having drunk alcohol (Castro *et al.*, 1986; Medina-Mora *et al.*, 1991). In Mexico City, there was an increase in the proportion stating use in the 30 days prior to the study that increased from 15% in 1989 to 24% in 1993. This increase was observed in both males (from 21% to 31%) and females (from 13% to 17%) (Rojas *et al.*, 1998). By 1997, 27% of the males and 19% of the females reported drinking in the month preceding the interview (Villatoro *et al.*, In press).

Alcohol is rarely consumed on a daily basis. It is rather linked to special occasions, including weekends, paydays and festivities, where high quantities of alcohol are often ingested. Population surveys have documented that in Mexico, males drink more than females and that when the former drink, it is not common to include the spouse in the event, even though half of the drinking occasions occurred in the home. From this practice originates a high level of family problems (Roizen *et al.*, 1980). Youth (<18 years of age) report drinking mainly at their homes or in those of other peoples (66%), school parties (34%) and discos (42%) (Medina-Mora *et al.*, 1997).

Subjets and methods

This chapter is based on two household surveys, a national survey of the urban population conducted in 1989 and a more recent survey undertaken in 1996 in the Capital City, Mexico.

The 1989 National Survey

Data for this analysis were obtained through a National Survey of Addictions conducted in 1989 by two organisations within the Ministry of Health – the General Directorate of Epidemiology and the Mexican Institute of Psychiatry (IMP). This household survey obtained prevalence data on the use of tobacco, alcohol and other drugs within a random sample of 12,557 individuals between the ages of 12 and 65 years of age. The sample was selected by using the Ministry of Health's master sampling framework. Only residents of urban localities with over 2,500 inhabitants, which accounted for 65% of the national population, were eligible.

The study sample was selected in several stages. The total sample size for the country was estimated to be 15,000 households and sample sizes for each of the 32 states that form the country were determined proportionally to their size. The primary units of sampling were Geo-statistic Basic Areas defined for the Xth General Population and Household Census of 1980. These units were also selected proportionally to their size. Within each primary unit, households were listed and randomly selected. Only one individual per household was selected at random based on pre-determined schedules for an interview. Data were weighted to take differences in the probabilities of selection into account.

Overall, 84% of eligible participants filled the questionnaire in a consistent way. The data yielded results applicable to the urban National population aged 12 to 65 years and belonging to each of seven regions.

The information was gathered using a standardised questionnaire previously tested and completed through face-to-face interviews by 65 trained interviewers, social workers, psychologists and nurses. Ten supervisors accompanied the interviewers and were responsible for assuring the quality of the information gathered and the correct selection of the person to be interviewed.

Measures

Patterns of alcohol use and overall intake were based on the respondents' self-reports of frequency and quantity of drinking any alcoholic beverage including *pulque* (a fermented drink obtained from a Mexican *agave*), table wine, beer, liquor, "*aguardiente* " and pure cane alcohol (96°) during the 12 months prior to the survey. The questions were adapted from those used by Room (1985) and Caetano (1987) from the Alcohol Research Group, that have proved to be useful to assess drinking patterns in Mexico (Medina-Mora, 1992). The respondents frequency of drinking each type of beverage was coded in 12 categories ranking from: '*Never*' to '*Three or more times a day*'. Drinking quantity was elicited by asking the frequency with which the respondent drank '*5 or more*', '*3 or 4*' and '*1 or 2 glasses or cans*' of the five types of alcoholic beverages considered. In order to correct the low top level of 5 or more drinks, two overall questions on frequency of drinking '*12 or more*' and '*8 to 11 drinks*' per drinking occasion were also included.

Abstainers

Lifetime abstainers have never drunk alcoholic beverages whereas last year abstainers were those that drink less than once a year.

Frequency of drinking

The questionnaire contained the following alternative answers with regard to the frequency of drinking alcoholic beverages:

- Every day
- 5-6 times per week
- 3-4 times per week
- 1-2 times per week
- 2-3 times per month
- Once a month
- 7-11 times per year
- 3-6 times per year
- 2 times per year
- Only once in the last year
- Never.

These categories were recoded as follows for the analyses:

- 5-7 times weekly
- 1-5 times weekly
- 1-3 times monthly
- 1-11 times a year
- Less than once a year (abstainers).

Quantity of drinking

Respondents were also asked to report the frequency with which they drank different amounts of alcohol including the frequency of drinking five or more drinks per occasion. An indicator of heavy drinking was constructed by combining the frequency and quantity variables. Frequency of having at least five drinks per occasion was further recorded into three groups: '*Weekly or more*', '*1-3 times per month*' and '*Less than once a month*'.

Alcohol-related problems

The questionnaire included three different measures of alcohol-related problems:

- Social problems were regrouped into eight categories: family, work, health and police problems, car accidents, other type of accidents, fights and loss or nearly loss of a job due to alcohol intake. At least one positive answer in one of these specific items indicated the presence of social problems related to alcohol.
- Personal problems included items that measured ICD 10 criteria of dependence: neglect of alternative pleasures in favour of alcohol use, persisting use despite awareness of harmful consequences, increased tolerance, withdrawal symptoms, use to relieve withdrawal, narrowing of repertoire of drinking, impaired control, compulsion to intake and rapid reinstatement of syndrome after a period of abstinence. Persons that had experienced three or more of such symptoms were considered as dependent to alcohol.
- Questioning about binge drinking, blackouts and health problems assessed the presence of other personal problems.

The Mexico City Survey

In Mexico City, the design of the study was a household survey restricted to the Federal District, excluding the rest of the metropolitan area. The target population was composed of all adults aged 18 to 65 years living permanently or temporarily in private dwellings in the 16 political division areas of the city. The design was that of a multistage stratified sample, with gender and availability of mental health services in the political divisions of the city as stratification factors. Two domains were defined based on the existence of mental health services: eight political divisions with mental health services and eight without. The primary sampling unit corresponded to the geo-statistic basic area (AGEB) defined for the XIth General Population and Household Census in 1990. These were selected with probabilities relative to their size. The second sampling stage consisted in selecting, for each selected AGEB, six blocks with equal probability. Within the selected blocks, housings were grouped in segments of approximately seven dwellings. These segments represented the third sampling unit and were selected through a systematic procedure.

The final sampling stage selected one subject in each dwelling looking for an equal number of females and males within the selected dwellings. 4603 households were visited, obtaining complete information in 3300. From 3200 eligible subjects, complete interviews were obtained in 1934. 33% of non-response was associated with the informant, mainly because they were reported as temporarily absent or nobody was at home after at least four repeated visits at different hours and days. Data were analysed considering respondent's probability of selection. Trained interviewers with background in social and health sciences gathered information with research staff from the Mexican Institute of Psychiatry supervising the quality of the interviews.

Measures

The CIDI-Fresno (Aguilar-Gaxiola *et al.*, 1995), which is a modified version of the basic instrument that was used in the National Comorbidity Survey (Kessler *et al.*, 1994) in the United States, was chosen for this research. The CIDI assessment was expanded by adding the more detailed quantity-

frequency questions used in the U.S. National Household Survey of Drug Abuse (U.S. Department of Health and Human Services, 1993). These included a question on age at first use of alcohol (taking a drink more than just a sip). Also, questions were added from the expanded CIDI Substance Abuse Module (Cottler *et al.*, 1991) to obtain information on age of onset and recency of each symptom of alcohol dependence.

Abstainers

In the CIDI, only subjects that had at least 12 drinks during a 12-month period in their lifetime were further asked about alcohol consumption. Anyone who drank alcohol below that threshold was excluded. Current abstainers were those that reported never ever had a drink in their lives, those that have drank in their lives but never had 12 drinks during a 12-month period and those reporting complete abstinence during the previous 12 months. This definition differs from the one used at the National level.

Frequency / Quantity of Drinking

This information was obtained by asking respondents to report the largest number of drinks they had on a single day during the last year. Answers were recoded as follows:

- 20 or more
- 12 to 19
- 5 to 11
- 1 to 4 drinks.

According to the amount given, interviewees were then asked to provide the frequency with which they drank that specific amount. Answers could range from:

- Nearly every day
- 3 to 4 times a week
- Once or twice a week
- 1-3 times a month
- 7-11 times a year
- 3-6 times a year
- Once or twice a year.

These options were then recoded as:

- Daily or nearly every day
- Less often then daily, but at least once a week
- Less often then weekly but at least once a month
- Less often then monthly but at least once in the last 12 months.

Frequency of Drinking Significant Amounts

Answers to the above mentioned questions were recoded into the following categories:

- Weekly or more often
- 1-3 times a month
- 1-11 times a year
- Not in the past year or never.

Only individuals that answered having 5 or more drinks on a single day were included.

Drinking Problems

A series of 18 questions were included in the questionnaire that conformed to the DSM-III-R criteria for alcohol abuse and dependence. The three more common problems reported in the previous 12-month period were identified and included in the analyses. These problems are:

- Frequent intoxication or withdrawal symptoms while fulfilling major role obligations
- Continued substance use despite knowledge of persistent or recurrent problems
- Substance taken in larger amounts or over longer periods than intended.

Results

Abstention and Frequency of Drinking

At the national level, the rates of abstention are high with 33% of the females being lifetime abstainers and an additional 31% who did not drink any alcohol in the year prior to the survey (Table 1). In the case of males, these rates were 12% and 18% respectively. In both groups, the highest rates of abstention are observed among the youngest (among the 15-19 years of age, 27% of men and 44% of women reported never having had a drink) and oldest groups (in the 50-65 years, 10% of men and 39% of women were lifetime abstainers). Lifetime abstention rates were only 8% among males between 20 and 29 years of age and 6% among those between 30 and 49 years.

The most frequent pattern of alcohol intake for men is to drink 1 to 3 times per month (23%) or less than monthly (22%) while women drink less frequently, with 24% reporting drinking less than monthly and only 8% drinking at a frequency of 1-3 times a month. Very few men and women reported drinking 5 to 7 times weekly (5% and 1% respectively). This frequency of drinking increases with age, while only 1.5% of men between the ages of 15 and 19 years and 7.6% of those 50 years and older reported drinking with this frequency. Among women, rates were 0.7% and 1.6% respectively with an important increase observed after reaching 30 years of age.

Especially among women, abstention rates diminished as education levels rises: 76% of women and 38% of men with no formal education were lifetime or last year abstainers, while this was only true for 54% and 26% respectively of those that had attended school for 13 years or more. Although drinking is positively associated with education, frequent drinking is negatively related. Indeed, the highest proportion of daily or almost daily drinkers (5 to 7 times per week) were found in the less educated groups, with 6% of men without any formal education reporting this frequency of drinking, while this was true for only 4% of those with 13 or more years of education. These proportions for women were 2% and 0.7% respectively.

In Mexico City, the proportion of persons that reported never having had any alcoholic beverage was considerably smaller, with only 3% of men and 17% of women qualifying for this category (Table 2). While 27% of young males between ages 15 to 19 years reported never having an alcoholic beverage in the country, this was true for only 2% of males from the same age group in Mexico City. Young males in the Capital City did not importantly differ in the rates of lifetime abstention from other age groups. On the contrary, rates of lifetime abstention among young females in the Capital City were around twice higher than what was reported for other age groups, still being 1.5 times lower than the national average. Also, while only a small proportion of the population reported never having attended school (1.8% of the males and 3.4% of the females), rates of abstention (either lifetime or during the last 12 months) were higher for this group among both men and women.

Heavy Drinking

Heavy drinking is a male behaviour. Among current drinkers, while more than two out of three men (72%) in the urban population sometimes drink high quantities, this is true for less than one in five women (18%) (Table 3). Indeed, heavy-drinking behaviours at a frequency of at least once a week is 13 times more frequent among men than women. Among men, heavy drinking is less frequent for the younger (57%) and older age groups (61%) as compared to the middle age groups, of which 76% reported drinking five or more drinks per sitting at least occasionally. Frequent heavy drinking follows the same trend with only 12% and 15% of the young and older segments of the population reporting drinking high amounts on a weekly basis, as compared to 20% among middle-aged men.

This pattern differs among women. In that sub-group where heavy drinking is less frequent among younger group (13% of those aged between 15 and 19 years reported drinking significant amounts compared to 17% among those 20 to 29 years and 21% among those aged 30 to 49). Also, the proportion of frequent heavy drinkers increases with age, while only 0.7% females between 15 and 19 years of age reported heavy drinking at least once a

week, compared to 2.5% of those older than 50 years of age. Heavy drinking decreases with level of education for both men and women with frequent heavy drinking being less common among the more educated.

In Mexico City, the proportion of male current drinkers having ever had significant amounts on one occasion slightly increases with education levels (78.4% among those without formal education vs 81% among those with at least 13 years of formal education) whereas that of women decreases with education (Table 4). Indeed, none of the women without formal education reported heavy drinking behaviours whereas 28.4% of those with higher levels of education reported doing so in some occasions, usually less than monthly.

Around half of the men that drink on a weekly basis drink high quantities with the same frequency (49%), but this was true for only a small proportion of women (11%) (Table 5). Also, only 14% of women that drink less than once a month reported having ever had five or more drinks at one sitting. For men, this proportion is 53%. Finally, drinking significant amounts is more frequent amongst frequent drinkers, as could be expected.

Drinking Problems

One in each ten urban men in the country had developed dependence as compared to only 0.6% of women (Table 6). When only drinkers are considered, these proportions rise to 15% of men and 1.6% of women. Problems with the family, at work and with the police were the most frequent type of problems reported by males in the national sample. Females report a small rate of problems with less than 2% of all women and less than 5% of female drinkers having reported problems due to their drinking habits. The most commonly reported problems were those related to the family and problems at work.

In Mexico City, problems to handle alcohol such as being frequently intoxicated while fulfilling major role obligations, continued use despite recurrent problems or drinking larger amounts than intended were reported by less than 1% of women and by 7% to 12% of men (Table 7).

Problems are closely related to the frequency of drinking. For instance, 29% of the men and 15% of the women who drink daily or almost daily met the alcohol dependence criteria (Table 8). This was also true for 35% and 27% respectively of men and women drinking significant amounts weekly or more. Among men, the prevalence of most alcohol-related problems is higher in those drinking 3-4 times a week than among those drinking every day. Among women, only problems with the family and problems at work are significantly high, with 23% of those drinking everyday having reported such problems.

Discussion

This study shows that rates of abstention in the urban population in Mexico are quite high, especially among females. The highest levels of consumption are observed among middle-aged men and decrease after 50. The lowest rates are observed among the youngest age groups of which a high proportion are under the legal age for consuming alcohol, which in the country is 18 years of age. In the capital city, a big urban metropolitan area, levels of abstention are considerably lower: lifetime abstinence for instance, is almost 5 times lower among men and around half of what is observed for women, compared to the National sample.

Differences in the rates of abstinence might reflect an increase in per capita consumption and increased levels of drinking among females and youth. This is consistent with what has been observed in the country in both general population and students' surveys, trend that might be more pronounced in the Capital City due to higher levels of availability, and school status and buying power of the population.

Though a word of caution must be considered as the different wording in the questionnaires might had played an important role in the difference in the information provided by respondents. In the national survey, respondents were directly questioned about the frequency with which they drank alcohol (with an option being never had an alcoholic beverage). In Mexico City, the question stated "About how old were you the very first time you had more than just a sip of beer, wine or liquor" with an option being "never".

Furthermore, there is no possibility of making direct comparisons of frequency of drinking; the scale for psychiatric diagnosis used in the Mexico City study, though having more questions than the original version, is oriented toward assessing abuse and dependence, questions of patterns of use are limited. Last year abstinence gathers all those persons that have never had 12 drinks in their life time and those that when asked about the largest number of drinks they had on any single day during the last 12 months, stated "zero". Most of the respondents meet these criteria, 65% for the females and 35% of the males, which is higher of what was observed in the national sample, (18% and 30.6% respectively), adding the two categories of abstention (life time and 12 months), rates for males in the national and local samples are similar and rates for females are significantly higher among those living in Mexico City.

Due to the way the question is worded, there is a possibility that respondents misunderstood the following question: "In any one year period of your entire life, did you have at least 12 drinks of any kind of alcoholic beverage?" as meaning drinking this amount in a single day or sitting. That would explain the high concentration of respondents of both genders and all age groups in this category. Also, non-response rates were relatively high and bias could have been introduced as the result of differential non-response rates.

Females drink less frequently and also report lower rates of heavy drinking; while two of three males are heavy drinkers, this is true for only one of five females. Although it is expected for females to have lower rates of heavy use due to cultural values and biological differences, it is also true that in spite of the known variations on alcohol assimilation and effects, females were scored with the same levels of consumption used for males. Maybe if lower thresholds were to be used for females, fewer differences would have been observed. In fact females share of the highest deciles is on top of what is observed for males.

Similarly, less females report having problems, but problems do not include those more common among females, such as cuts or burns, disregarding the children, depression or problems with their sexuality, among others, suggesting the need to modify our questionnaires to better assess variations of behaviour and consequences among this group.

Education level plays an important role in patterns of intake, drinking is positively correlated to the level of education, while heavy drinking is negatively associated, with the highest proportions of daily drinkers among the less educated groups. These data suggest that while drinking might be associated to levels of fluency, heavy drinking is linked to other variables that gather around not having had access or success in school.

Due to the important trends in the availability of alcoholic beverages, in the demographic composition of the population and the economical turmoil that the population is facing, important differences in the drinking patterns and problems might be occurring, trends that deserve close surveillance.

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Table 1

Drinking frequency (%) by gender, age and education, Mexico: Urban population

	n	LIFETIME ABSTAINERS	LAST YEAR ABSTAINERS	LESS THAN MONTHLY	1-3 TIMES/ MONTH	1-2 TIMES/ WEEK	3-4 TIMES/ WEEK	5-7 TIMES/ WEEK
OVERALL	**11157**	23.5	24.8	22.7	15.2	9.2	1.6	2.9
SEX								
Men	**5237**	12.1	18.3	21.6	23.4	16.6	2.9	5.0
Women	**5920**	33.6	30.6	23.6	8.0	2.7	0.4	1.1
AGE MEN								
15-19	**1174**	26.8	23.7	22.0	15.4	9.5	1.1	1.5
20-29	**1720**	8.5	13.9	22.4	28.2	20.4	2.5	4.1
30-49	**1683**	6.2	16.8	20.7	26.1	18.5	4.2	7.5
50-65	**661**	10.3	24.5	21.0	18.2	14.5	3.9	7.6
WOMEN								
15-19	**1154**	43.9	25.8	22.1	5.4	1.9	0.1	0.7
20-29	**1821**	29.4	29.8	26.9	10.3	2.8	0.1	0.7
30-49	**2099**	29.5	31.4	24.4	9.0	3.7	0.6	1.4
50-65	**846**	39.0	36.6	16.9	3.9	1.3	0.8	1.6
EDUCATION MEN								
None	**249**	15.6	21.7	16.1	19.6	17.9	2.8	6.3
1-6 years	**1545**	10.9	20.3	21.0	19.9	17.3	3.5	7.2
7-12 years	**1288**	16.0	19.2	21.0	21.0	16.7	2.6	3.4
13 years and +	**2147**	10.3	15.9	23.0	27.7	16.0	2.7	4.3
WOMEN								
None	**481**	41.1	34.8	12.8	6.5	1.5	1.2	1.9
1-6 years	**2270**	40.0	30.7	20.8	4.9	2.1	0.5	1.1
7-12 years	**1351**	34.0	28.7	26.7	6.9	2.3	0.1	1.3
13 years and +	**1803**	23.5	30.4	27.9	13.1	4.1	0.2	0.7

Table 2

Drinking frequency (%) by gender, age and education, Mexico City

	n	LIFETIME ABSTAINERS	LAST YEAR ABSTAINERS	LESS THAN MONTHLY	1-3 TIMES/ MONTH	1-2 TIMES/ WEEK	3-4 TIMES/ WEEK	5-7 TIMES/ WEEK
OVERALL	**1932**	10.9	52.0	22.0	9.2	3.9	1.6	0.4
SEX								
Men	**837**	2.7	35.1	33.4	17.3	7.5	3.2	0.8
Women	**1095**	17.2	64.9	13.3	2.9	1.2	0.4	0.1
AGE MEN								
15-19	**46**	2.1	46.3	22.0	14.6	11.1	2.1	1.7
20-29	**323**	3.5	35.7	28.1	20.0	8.9	3.5	0.3
30-49	**341**	2.6	28.4	40.6	17.8	5.7	4.2	0.7
50 and +	**127**	1.0	47.3	31.8	9.8	8.0	–	2.1
WOMEN								
15-19	**74**	28.4	60.4	1.4	1.5	8.3	–	–
20-29	**344**	15.5	66.6	14.6	2.1	1.1	0.2	–
30-49	**506**	17.1	62.4	14.9	4.3	0.6	0.5	0.2
50-65	**171**	15.8	71.1	11.3	1.1	–	0.7	–
EDUCATION MEN								
None	**15**	–	61.9	29.0	3.0	6.1	–	–
1-6 years	**201**	1.1	35.3	29.6	19.2	8.2	4.3	2.2
7-12 years	**398**	2.1	34.7	34.5	17.0	8.1	3.2	0.3
13 years and +	**223**	5.2	33.8	35.2	17.0	6.1	2.4	0.4
WOMEN								
None	**37**	32.3	65.0	1.3	1.5	–	–	–
1-6 years	**327**	19.4	65.5	11.9	2.4	0.4	0.2	0.2
7-12 years	**574**	16.1	65.0	13.4	3.1	1.9	0.5	0.1
13 years and +	**157**	12.8	63.7	18.7	3.7	0.4	0.7	–

Table 3

Heavy drinking frequency (%) by gender, age and education among current drinkers, Mexico: Urban population

	n	NEVER	LESS THAN MONTHLY	1-3 TIMES/ MONTH	WEEKLY OR MORE
OVERALL	**5762**	48.0	22.5	17.6	11.9
SEX					
Men	**3643**	28.4	27.7	25.8	18.0
Women	**2119**	81.8	13.5	3.4	1.4
AGE MEN					
15-19	**581**	43.0	29.5	15.3	12.3
20-29	**1335**	23.5	26.6	30.4	19.4
30-49	**1296**	23.6	29.2	26.9	20.3
50-65	**431**	38.7	24.0	22.6	14.7
WOMEN					
15-19	**349**	87.4	9.6	2.3	0.7
20-29	**743**	82.7	13.6	3.2	0.6
30-49	**820**	78.9	15.5	3.6	2.0
50-65	**207**	80.8	11.5	5.3	2.5
EDUCATION MEN					
None	**156**	21.3	19.9	40.1	18.6
1-6 years	**1063**	24.1	28.6	25.0	22.3
7-12 years	**833**	31.9	26.4	21.2	20.4
13 years and +	**1585**	30.3	28.3	27.5	13.9
WOMEN					
None	**116**	71.7	18.0	9.2	1.1
1-6 years	**666**	80.2	14.7	3.3	1.8
7-12 years	**503**	83.7	10.9	3.5	1.9
13 years and +	**832**	83.3	13.3	2.6	0.7

Table 4

Frequency of heavy drinking (%) by education and gender among current drinkers, Mexico City

	n	NEVER	LESS THAN MONTHLY	1-3 TIMES/ MONTH	WEEKLY OR MORE
OVERALL	717	73.9	13.1	7.9	5.3
EDUCATION					
MEN					
None	**6**	0.0	76.2	8.0	15.9
1-6 years	**128**	21.6	30.4	25.5	22.5
7-12 years	**252**	17.5	40.7	25.0	16.8
13 years and +	**136**	19.0	40.4	26.9	13.7
WOMEN					
None	**1**	100.0	0.0	0.0	0.0
1-6 years	**49**	48.5	36.1	13.7	1.7
7-12 years	**108**	59.7	25.8	9.9	4.6
13 years and +	**37**	71.6	20.9	2.8	4.7

Table 5

Frequency of heavy drinking (%) by drinking frequency among current drinkers by Gender. Mexico: Urban population

	LESS THAN MONTHLY	1-3 TIMES/ MONTH	1-2 TIMES/ WEEK	3-4 TIMES/ WEEK	5-7 TIMES/ WEEK
HEAVY DRINKING FREQUENCY					
MEN (n)	**1130**	**1125**	**870**	**153**	**264**
Never	47.3	25.2	15.8	15.6	12.2
Less than monthly	52.7	18.5	14.1	10.4	18.1
1-3 times/month	–	56.3	21.5	16.7	14.7
Weekly or more	–	–	48.7	57.3	55.0
WOMEN (n)	**1400**	**471**	**161**	**23**	**64**
Never	86.1	76.2	70.4	76.2	59.1
Less than monthly	13.9	12.9	7.5	13.9	23.1
1-3 times/month	–	10.9	10.7	5.9	3.2
Weekly or more	–	–	11.4	4.0	14.6

Table 6

Prevalence of drinking problems (%) by gender in the population and among current drinkers. Mexico: Urban population

	PREVALENCE IN THE POPULATION		PREVALENCE AMONG DRINKERS	
DRINKING PROBLEM	MEN (n=5237)	WOMEN (n=5920)	MEN (n=3643)	WOMEN (n=2119)
Dependence	10.6	0.6	15.3	1.6
Family	17.4	1.4	25.0	4.0
Car accident	6.5	0.2	9.4	0.6
Problem at work	11.7	1.7	16.9	4.6
Other accidents	6.1	0.1	8.8	0.1
Health	4.3	0.1	6.2	0.4
Fights	4.3	0.2	6.1	0.6
Police	10.7	0.4	15.3	1.1
Lost job	2.8	0.1	4.0	0.2

Table 7

Prevalence of drinking problems (%) in the population and among current drinkers by gender. Mexico City

	PREVALENCE IN THE POPULATION		PREVALENCE AMONG DRINKERS	
PROBLEM ITEMS	WOMEN (n=1095)	MEN (n=837)	WOMEN (n=196)	MEN (n=521)
Frequent intoxication or withdrawal symptoms while fulfilling major role obligations	0.7	12.1	3.9	19.5
Continued substance use despite knowledge of persistent or recurrent problems	0.6	7.1	3.3	11.5
Substance taken in larger amounts or over longer periods than intented	0.7	6.8	3.9	10.9

Table 8

Prevalence of drinking problems by frequency of drinking and heavy drinking frequency among current drinkers, by gender. Mexico: Urban population

	FREQUENCY OF DRINKING					HEAVY DRINKING FREQUENCY			
	LESS THAN MONTHLY	1-3 TIMES/ MONTH	1-2 TIMES/ WEEK	3-4 TIMES/ WEEK	5-7 TIMES/ WEEK	NEVER	LESS THAN MONTHLY	1-3 TIMES/ MONTH	WEEKLY OR MORE
MEN (n)	**1130**	**1225**	**870**	**153**	**264**	**1036**	**1009**	**942**	**657**
Dependence	4.4	14.4	22.8	35.9	29.3	2.6	9.2	22.1	35.0
Family	14.1	24.9	32.5	41.8	37.7	12.0	20.9	29.0	46.0
Car accident	4.5	6.4	13.2	22.9	24.1	3.0	7.2	10.7	21.2
Work	10.9	17.6	19.0	28.8	25.2	10.7	16.4	19.3	23.9
Others accidents	3.9	7.0	13.7	17.6	17.3	2.3	7.0	11.2	18.5
Health	3.3	6.2	7.2	17.5	9.0	1.3	5.5	8.1	12.2
Fights	3.7	6.0	6.8	11.9	11.4	1.4	6.4	6.8	12.2
Police	9.0	12.5	21.4	34.2	24.7	5.6	13.5	17.9	29.7
Lost job	1.9	2.6	5.5	11.5	10.9	1.2	2.4	4.0	11.2
WOMEN (n)	**1400**	**471**	**161**	**23**	**64**	**1733**	**285**	**72**	**29**
Dependence	0.6	1.3	5.9	4.1	15.1	0.2	5.9	8.0	27.4
Family	1.6	6.7	10.1	2.3	22.6	1.9	12.5	13.7	25.3
Car accident	0.1	0.7	2.4	3.9	5.6	0.3	1.9	2.4	2.5
Work	3.3	5.1	7.9	2.9	22.9	2.9	12.1	10.3	20.5
Others accidents	0.1	0.2	0.3	2.4	0.0	0.1	0.5	0.1	1.6
Health	0.2	0.9	0.7	0.0	0.5	0.3	0.7	1.6	0.0
Fights	0.3	0.9	1.2	0.0	5.2	0.2	1.4	5.8	5.4
Police	0.5	1.3	2.6	0.0	10.8	0.4	4.3	5.7	2.3
Lost job	0.0	0.3	1.9	0.0	0.0	0.2	0.0	1.9	0.0

Biography

Ma. Elena Medina-Mora

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Alcohol Epidemiology in Costa Rica

COSTA RICA

Julio Bejarano

National Institute on Alcoholism and Drug Dependence (I.A.F.A., Costa Rica)

This work is based on the data base corresponding to the IAFA's National survey on alcohol, tobacco and other drugs carried out in 1995.

Federico Ugalde, statistician at the National Institute on Alcoholism and Drug Dependence (IAFA), made table confection for this work possible.

Background

Costa Rica is a Central American nation. The total estimated population for the year of 1994, according to the *Dirección General de Estadística y Censos* (National Bureau of Statistics and Censuses), counts to a total of 3.3 billions inhabitants. One third of the total population is 15 years of age or younger, 4.6% are aged over 65 and women constitute 50.5% of the total population. Half of the population is distributed in rural areas. Although official statistics do not include the immigrant population, the number of Nicaraguans migrating from the northern border and living in Costa Rica is quite significant, reaching up to 600,000 people.

Since 1995, Costa Rica is considered one of the first countries in Latin America that supports a sustained human development, according to the United Nations Development Programme (UNDP) Human Development index (position 45 of 174 countries) (Human Development Report, 1999). Costa Rica have shown a healthy growth in its economy and a balanced political stability, as well as significant advances in social matters. Costa Rica has set education as a priority, strengthening and expanding the system to rural and urban areas. In 1994, illiteracy in individuals of 13 years of age was 8.8% in the rural zone and 3.6% in urban areas. The last national census was carried out in 1984.

The general mortality rate in the years of 1990 to 1992 was estimated to be 3.8 per 1,000 inhabitants. The census reported 13,313 deaths in Costa Rica in 1994. Among the primary causes of death are chronic illnesses and motor-vehicle accidents. Infant mortality represents 7.8% of the total deaths registered in the country during 1994. The estimate of infant mortality in 1990 was 15.3 per thousand born alive, this figure having decreased to 13.0 in 1994.

Since the beginning of the century, prevention, treatment and research in the field of alcohol and other drug problems have been carried out by the National Institute on Alcoholism and Drug Dependence (IAFA). Since 1974, IAFA is funded and controlled by the Ministry of Health. Alcohol is a major concern in the country and it is partially explained by the high degree of permissiveness to drink. The patterns of alcohol intake are related to consumption of large amounts per episode and a certain ability to abstain during several days a week.

In Costa Rica and in Latin America in general, a strong relationship between alcohol intake and cultural and social celebrations has been found (Madrigal, 1998). A trend towards drunkenness behaviours can also be found in youngsters (Grant.and Litvak,1997; Bejarano and San Lee, 1997). The creation of the *Fábrica Nacional de Licores (*National Factory of Distillates) in 1850, a governmental business, partially explains the low levels of home-brew production and other illicit production of alcohol beverages.

Six national surveys on alcohol and drug abuse have been carried out by IAFA. The first study was done in 1969, the following three during the eighties and the remaining two in the nineties. Of those, only the latter two can be compared. The 1995 survey, from which this manuscript is drawn, is a transversal study repeated every five years.

Methods

Sampling Aspects

The sample was drawn from all Costa Rican inhabitants aged between 12 and 70 years and living in private households for at least one year. The sample was calculated based on the 1995 population, according to the estimates carried out by *Dirección Nacional de Estadística y Censos* (National Direction of Statistics and Censuses). The sample design did not include inmate populations, hospitalized patients, homeless people or those without established residence. Sample size calculations were based on a maximal permissible error of ±0.02, a percentage of rejection and non-response of 4%, at a confidence level of 96%. The number of individuals was set according to the total population size in each province, equally distributed by age and sex.

The multistage sampling method was used. At each stage, the sampling procedure included aleatory selection of segments in each of the seven provinces of the country. A segment is a geographical area with an arbitrary delimitation (streets, houses, rivers, etc…) including approximately 50 houses. Followed systematic selection of the houses within segments and selection of the individual within the household according to a quota for sex and age groups. Seventeen interviews per segment were carried out from April to June 1995. A total of 2922 interviews were completed, representing an overall response rate of 97.1%. Although the sample included individuals aged 12 to 70 years, all those aged 12 to 14 (n=191) were eliminated for the purpose of this study, bringing the sample down to 2731 interviews.

Measurements

The questionnaire, designed at IAFA, consisted of more than a hundred questions distributed into nine sections. It explored the social and demographic context (age, occupation, educational level, religion, ethnicity, etc.), as well as health aspects, alcohol intake and alcohol-related problems, knowledge and opinions with regards to drugs and other psychosocial problems.

Drinking habits

Respondents were first asked if they ever had any alcoholic beverage in their entire life. Those who answered "no" were classified as lifetime abstainers. Among respondents who reported having ever drank alcoholic beverage (such as beer, whisky, guaro -local cane spirit-, gin) were asked detailed information about their drinking habits. They were asked when was the last time they drank an alcoholic beverage:

- Last 24 hours
- Last week
- Last 30 days
- More than one month but less than one year
- More than twelve months ago.

Those in the last category were classified as "last year abstainers" whereas those who reported drinking over the last year were classified as "current drinkers". Those who reported drinking in the last month were also asked how many days they drank and how many days they had 5 or more drinks or beers. High quantity monthly drinkers (or heavy drinkers) were defined as those who had five drinks or more at least once in the last month.

Alcohol-related problems

The CAGE questionnaire (Ewing, 1984) was used to measure drinking problems along with a list of symptoms experienced several hours after taking the last drink (namely anxiety, insomnia, nausea, vomiting, diarrhea, depression, tremor, blackouts, hallucinations and convulsions). Respondents were also asked if they have tried to stop drinking in the past 12 months.

Results

Socio-demographic characteristics

Table 1 shows the distribution of socio-demographic characteristics of respondents, stratified by gender. In the study sample, men (n=1360) and women (n=1371) were distributed evenly, the latter being slightly older, less educated and less likely to be single.

Drinking status

Table 2 displays the distribution of drinking status according to socio-demographic characteristics. Overall, 55.2% of men and 29.6% of women are current drinkers. Men aged between 20-49 years are more likely to be drinkers than youngest and oldest men. Among women, the prevalence of drinking is lower for those 50 years and over. For both men and women, the prevalence of drinking increases with education. One in two women never drank over their entire life compare to one in five for men. Abstaining men are mainly former drinkers whereas most abstaining women had never drunk in their life. In men, the rate of lifetime abstinence steadily decreases with age whereas in women, the prevalence of lifetime abstinence is rather uniform across ages. Nevertheless, for women the rate of lifetime abstainers decreases with increasing education.

Drinking frequency

Most drinkers are occasional drinkers: 38% report drinking less than monthly, 41% one to three times a month and 21% on a regular basis, i.e. once a week or more (Table 3). Regular drinking is more prevalent among men (28%) than among women (7.6%). The prevalence of frequent drinking increases with age both in men and women. Education is also associated with drinking frequency, with less educated men and women drinking less often.

Heavy drinking

Of 1154 current drinkers, 23% reported heavy drinking behaviours, i.e. having frequently had significant amounts of alcohol (Table 4). This prevalence was higher in men (33.7%) than among women where it is rather low (5.9%). In all age groups, women registered lower prevalence of heavy drinkers. Heavy drinking was more frequent among 20-49 years men than it was in younger and older men. Among women, these patterns are almost inexistent in 19 years or less. The association of educational levels and the prevalence of drinking also differ in men and women. For instance, more educated women display higher prevalence of heavy drinking (up to 9.1%), whereas the higher prevalence of heavy drinking in men may be found among those with 1-8 (34.9%) and 9-13 years (35.8) of school attainment.

Drinking-related problems

The prevalence of drinking problems in the last year is steadily higher among male drinkers that it is in women, and so is it among heavy drinkers, relative to non-heavy drinkers (Table 5). The analysis of the CAGE questions in separate ways reveals that the prevalence of a positive answer to the first item (*Have you ever felt the need of reducing the quantity of alcohol you drink?*) tends to cluster in heavy drinking men (53.4%) and women (41.7%). A very high proportion of heavy drinking men (48.2%) and women (50.0%) have also attempted to stop drinking in the past 12 months, a prevalence which in women, is 15 times higher among heavy drinkers than it is among non-heavy drinkers (50% versus 3.3% respectively). Other items of the CAGE questionnaire were less prevalent than the eye-opener and the cutting down on drinking ones, but still important and more so among heavy drinkers than no-heavy drinkers.

Discussion

The possibility of taking specific approaches towards the problem of alcohol consumption and abuse offers an important advantage, given the individual and social effects of alcohol. The results of a population survey in Costa Rica reveal some aspects of alcohol drinking that should not be ignored. Drinking is not part of most Costa Rican everyday life: most women do not drink (70%), those who do are occasional drinkers and heavy drinking is a rare phenomenon among women. Drinking in men is more common than it is in women but still, only one in two men is a current drinker and 13% drink on a weekly basis. Nevertheless, close to one in five Costa Rican adult men has a heavier alcohol intake (5+ drinks per occasion) at least monthly.

A large proportion of heavy drinkers answered positively to the CAGE items which may indicate that they are at risk of alcohol-related problems as well as a social intolerance to heavy drinking in Costa Rican society (Bisson, Nadeau, Demers, 1999). Nevertheless, 42% of heavy drinking men and 38% of heavy drinking women reported having used alcohol as an *eye-opener*, which is the most robust indicator in the CAGE of alcohol-related problems. On the other hand, it is noteworthy that one in five monthly drinkers who do not drink heavily felt that they might reduce their consumption and have tried to reduce their consumption.

In a public health perspective, these results raise concerns regarding alcohol-related problems. Even if heavy drinking remains at a relatively low level among the adult population, these results indicates that heavy drinkers may be at high risk of alcohol-related problems. Therefore, more attention should be placed on the harmful use of alcohol than in the promotion of abstinence. It is important to reduce the frequency of heavy drinking through education, especially in younger people whose drinking is usually practiced with the purpose of achieving intense intoxication. Furthermore, the need of reducing heavy drinking by specific strategies, such as decreasing the amounts consumed per occasion and the frequency of drinking occasions, must be legally enforced. Other measures targeting alcohol availability, such as the minimum drinking age, avoidance of intoxication in public places, taxation policies could also be considered. Finally, because there are cultural similarities as well as differences in drinking patterns, and because the country needs better strategies to prevent alcohol-related problems, the inclusion of cultural variables in future surveys is important to better understand the diversity in drinking patterns and contexts.

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Table 1

Socio-demographic characteristics (%) of respondents. Costa Rica, 1995.

CHARACTERISTICS	MALES n=1360		FEMALES n=1371	
	n	%	n	%
AGE				
15-19	215	15.8	191	13.9
20-29	354	26.0	361	26.3
30-49	520	38.2	533	38.9
50 and +	271	19.9	286	20.9
EDUCATION				
None	71	5.3	66	4.8
1-6 years	679	50.3	744	54.6
7-12 years	437	32.2	424	31.1
13 years and +	164	12.1	129	9.5
MARITAL STATUS				
Single	534	39.3	336	24.5
Married	632	46.5	757	55.2
Free union	154	11.3	166	12.1
Separated/Divorced/Widowed	40	2.9	111	8.0
RESIDENCE				
Urban	695	51.1	709	51.7
Rural	665	48.9	662	48.3

Table 2

Drinking status (%) according to socio-demographic characteristics

SOCIO-DEMOGRAPHIC CHARACTERISTICS	n	LIFETIME ABSTAINERS	LAST YEAR ABSTAINERS	CURRENT DRINKERS (LAST YEAR)
TOTAL	**2727**	34.7	23.0	42.3
GENDER				
MEN	**1357**	18	26.8	55.2
WOMEN	**1370**	51.2	19.2	29.6
AGE				
MEN				
15-19	**215**	47.4	10.7	41.9
20-29	**353**	18.7	17.5	63.8
30-49	**519**	10.9	29.9	60.2
50 +	**270**	6.6	47.7	45.7
WOMEN				
15-19	**191**	57.1	12.6	30.3
20-29	**361**	50.4	18.8	30.8
30-49	**533**	46.5	19.1	34.4
50 +	**285**	57.2	24.5	18.3
EDUCATION				
MEN				
None	**71**	17	49.2	33.8
1-6 years	**677**	17.2	31.3	51.5
7-12 years	**436**	20.1	21.8	58.1
13 years and +	**171**	15.2	11.7	73.1
WOMEN				
None	**66**	68.2	15.1	16.7
1-6 years	**744**	58.1	19.6	22.3
7-12 years	**424**	42.2	19.6	38.2
13 years and +	**131**	31.3	19.1	49.6

Table 3

Drinking frequency (%) according to socio-demographic characteristics among drinkers.

SOCIO-DEMOGRAPHIC CHARACTERISTICS	n	LESS THAN MONTHLY	1-3 TIMES/ MONTH	1-2 TIMES/ WEEK	3 OR MORE TIMES/ WEEK
ALL DRINKERS	**1154**	38.1	40.9	15.3	5.7
GENDER					
Men	**750**	31.1	40.8	20.5	7.7
Women	**404**	51.2	41.1	5.4	2.2
AGE MEN					
15-19	**89**	47.2	29.2	21.3	3.4
20-29	**226**	27.4	46.9	19.9	5.3
30-49	**312**	27.9	42.0	22.1	8.0
50 and +	**123**	34.1	35.0	17.0	13.8
WOMEN					
15-19	**58**	67.2	31.0	1.7	0
20-29	**111**	57.7	34.2	7.2	0.9
30-49	**183**	44.3	48.6	5.5	1.6
50 and +	**53**	43.4	39.6	5.7	9.4
EDUCATION MEN					
None	**24**	45.8	50.0	4.2	0
1-6 years	**349**	33.0	39.8	20.3	6.6
7-12 years	**254**	31.1	40.2	20.1	8.3
13 years and +	**120**	23.3	44.2	25.8	10.8
WOMEN					
None	**11**	45.5	54.5	0	0
1-6 years	**165**	58.8	37.0	2.4	1.8
7-12 years	**162**	51.2	39.5	6.8	2.5
13 years and +	**66**	33.3	51.5	10.6	3.0

Table 4

Prevalence of heavy drinking (%), by socio-demographic characteristics among drinkers.

CHARACTERISTICS	n	HEAVY DRINKERS (%)
ALL DRINKERS	**1154**	23.0
GENDER		
Men	**750**	33.7
Women	**404**	5.9
AGE MEN		
19 or less	**89**	21.1
20-29	**226**	35.8
30-49	**312**	38.5
50 and +	**123**	24.6
WOMEN		
19 or less	**58**	1.7
20-29	**111**	5.4
30-49	**183**	7.1
50 and +	**53**	5.6
EDUCATION MEN		
None	**24**	20.8
1-6 years	**349**	34.9
7-12 years	**254**	35.8
13 years and +	**120**	28.3
WOMEN		
None	**11**	–
1-6 years	**165**	4.8
7-12 years	**162**	6.2
13 years and +	**66**	9.1

Table 5

Prevalence of drinking-related problems in the past year (%), among heavy and non-heavy drinkers.

	NON-HEAVY DRINKERS		HEAVY DRINKERS	
DRINKING-RELATED PROBLEMS	MEN n=263	WOMEN n=122	MEN n=253	WOMEN n=24
Felt the need of reducing the quantity of alcohol	22.1	4.9	53.4	41.7
Felt uncomfortable because of people's criticism about drinking habits	8.4	1.6	33.6	20.8
Felt guilty about drinking habits	12.9	3.2	45.5	25.0
Have drunk early in the morning to calm a hangover	9.5	2.5	41.5	37.5
Have tried to stop drinking in the past 12 months	21.7	3.3	48.2	50.0

*EXCLUDING DRINKERS WHO DRINK LESS THAN MONTHLY

Biography

Julio Benjarano

He is a psychology graduate from the University of Costa Rica, with postgraduate studies in drug dependence from the Centre of Advance Studies at the University of Buenos Aires. He has carried out several research projects on drug abuse at the National Institute on Alcoholism and Drug Abuse of Costa Rica. Julio Bejarano is also a national and international consultant.

Alcohol drinking in Namibia

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Background

This manuscript describes drinking habits in Namibia. It is based on the first nation-wide survey on alcohol and drug use in Namibia, which was carried out in 1998. The issues we have addressed are abstinence, the frequency of drinking and heavy drinking, total intake of alcohol, the types of alcohol consumed and the prevalence of various problems related to alcohol use. Our special interest has been gender differences of drinking habits. While doing the analyses, we have also evaluated how well this first Namibian alcohol survey serves as a baseline survey.

Namibia is located in Southwest Africa on the Atlantic Ocean, bordering Angola in the north and South Africa in the south. Namibia was a German colony from 1884 until the early phases of the First World War. After the war, Namibia, which was then called Southwest Africa, was administered by South Africa under a League of Nations mandate. From 1971 onwards, South Africa held Namibia against the decision made by the International Court of Justice, until Namibia reached its independence in 1990. In the 1991 census, the population of Namibia was about 1.5 millions (Living Conditions in Namibia, 1996). At the time of the census, 43% of the population were below 15 years of age and about 70% were below 30 years. Only 5% of the Namibian population had reached the age of 65 years. Most of the population lived (and still do) in rural areas and in the northern regions of the country. Furthermore, the 1991 census reveals that 26% of the population aged 15 years or above and 66% of the population aged 65 years or over have never attended school (1991 Population and Housing Census, 1994). Educational attainment on the tertiary level was rare. Only 4% of the population aged 20 years or above have some kind of tertiary education.

Namibia is characterised by two separate economies. On the one hand, there is a modern sector, which employs highly advanced technologies in the production process and in the ways of life. On the other hand, there is a traditional sector, which depends on subsistence production and has not reached any level of sophistication or development. There are great differences in the income accruing to population groups associated to or supported by these sectors. A study conducted by the United Nations divided the population of Namibia into three groups: 'Whites', 'Non-whites supported by modern economy', and 'Non-whites supported by traditional economy'. The proportions of these three population groups were 5.1%, 40% and 54.9% respectively, but the proportion of the Namibian Gross Domestic Product they accounted for were 71.2%, 25.4% and 3.4% respectively (Living Conditions in Namibia, 1996).

Alcohol consumption patterns in Namibia have been in transformation. Traditionally, Namibians, like all Africans, were indulged in beer brewing by using sorghum, maize, millet and other traditional agricultural crops. Beer served as an incentive to work and was available at different special occasions ranging from agricultural ceremonies to entertainment. Traditional drinking was generally acceptable among male elders, although chiefs and kings controlled the use. Drunkenness was unacceptable. Because improper behaviour was condemned, the pre-colonial communities had limited alcohol consumption.

The contact with missionaries and European traders had a considerable impact on the social lives of Namibian people, because many of their traditional practices were eroded. The same happened to drinking habits. The colonial era brought spirits into Namibia and the colonial labour system supported occasional heavy drinking (The Green Paper, 1999, III.C.4-2). The racial liqueur laws prohibited the sale of alcohol to the indigenous people and strict regulations ruled where, when and to whom alcohol was being sold. In consequence of the legislation and the regulations, illicit trafficking increased. These regulations also supported and forced to adopt a particular drinking pattern known as 'get drunk – and fast – before the bottle is taken away'. In 1960, the ban was released. After that, alcohol consumption began to increase considerably. Since the beginning of the independence, the same trend has continued and the slowly widening relative affluence has brought along a very permissive atmosphere concerning alcohol use. Advertisement of alcohol is not controlled. Alcohol is readily available and its outlets are the most frequent services in the communities (The Green Paper, 1999, III.C.4-2). Production of home-brewed beverages is the dominant channel for alcohol availability. At the

time of the survey, it was illegal to brew beer at home, but control was practically non-existent and cheap home-brewed beer found easily a market among the low- or no-income consumers. Production of home-brewed beverages is closely connected to food production in both the urban and rural areas. The producers are a heterogeneous group, but many of them are women, particularly widows or divorced older women (Maula, 1997). The common denominator is the need to improve their economic livelihood. Especially for older women it is largely a question of survival.

Alcohol abuse is considered to be one of the main problems of Namibia (see, e.g., His Excellency, Dr Sam Nujoma, President of the Republic of Namibia, in the foreword to Programme for the Prevention and Combating of Substance Abuse and Illicit Drug Trafficking, 1995). This is the reason why it is understandable that alcohol became an issue in the social development co-operation project, the Health and Social Sector Support Program (HSSSP), through which Finland has supported the efforts of the Namibian Government to improve the health and social sector in the country. The Ministry of Health and Social Services (MoHSS) established the Alcohol and Drug Resource Centre, to run treatment, rehabilitation, prevention and counselling programs. In 1998, the Centre conducted the first nation-wide survey on alcohol and drug use in Namibia. The Nation-wide KAP (Knowledge, Attitudes and Practice) Baseline Survey on Alcohol and Drug Use and Abuse was prepared and administered for the MoHSS by a team consisting of the staff of a consulting company (SIAPAC), that of the MoHSS, the advisor of the HSSSP / Finland and a representative of the Food Security and Nutrition Secretariat of Namibia. The aim of the study was to reach an information base in order to plan a national program and to develop policies in the fields covered by the survey. This article and the country report are the first studies based on the Namibian baseline survey.

Subjects and methods

Study sample

The sample was designed to permit generalisation of the results to the populations under investigation. The main sample population consisted of Namibians aged 18 and older, both males and females. Sub-populations consisted of Namibians aged 18 and older based on the following regional strata:

- Windhoek (the Capital city)
- urban areas
- peri-urban areas / commercial farming centres (including the Oshikoto commercial farming area)
- rural Caprivi and Okavango Regions (Rural 1)
- rural Ohangwena, Omusati, Oshana, and Oshikoto Regions (Rural 2)
- rural Khomas, Kunene, Erongo, Omaheke, and Otjozondjupa Regions (Rural 3)
- rural Karas and Hardap Regions (Rural 4).

The order of the rural regions runs from the north to the south.

Within each of the seven strata, thirty clusters were randomly selected using an equal probability cluster sampling. The sampling involved a random selection of the starting number and the division of the total within-strata population by the total number of clusters (30), referred to as the interval. The random starting number was added to the interval and the first cluster was identified. Following this, the interval was added to the previous number and the remaining clusters were identified. This approach met the requirement of an equal probability sampling within each stratum, but also had the additional benefit of dispersing the sample across all the geographical areas in the stratum (SIAPAC, 1999). The decision to select the same number of clusters within each stratum resulted in variable sampling fractions between the strata.

Within each cluster, the field team established the 'population centre' (the central starting point), a location from which a random starting direction was selected (by spinning a bottle) for each interviewer. Next, a number was randomly selected from a bag of numbers (ranging from 1 to 20). The number identified the first household to be interviewed in the respective direction. Each adult in the household was assigned a number and one of them was randomly selected for interview. Once the first household was interviewed, the household to the right of the first one was identified for interview and after that the household to the right of the second one, and so on. All in all, 13 interviews were made in each location.

The sample size was based on the aim to generalise the findings to the populations under investigation. The sampling procedure guaranteed that the pre-specified sample size was reached because sampled persons who refused to participate were substituted by re-sampling. The number of filled and valid questionnaires totalled 2,832. Absenteeism of males in the households resulted in under-sampling of males, and this under-sampling varied between the strata. Therefore, the analyses presented in this article have been based on the data weighted by gender and strata. The weights were based on the populations aged 15 years and over in the 1991 Population and Housing Census. The number of cases in the tables are those of the original sample, because we wanted to draw attention to the fact that there were very few observations in some categories of variables.

The questionnaire was highly structured with predefined response codes. Written translations into relevant languages were prepared. Issues for inclusion in the questionnaire were identified during a brief workshop held with the MoHSS and the personnel of the consulting company. The issues included were knowledge, attitudes and practices regarding alcohol use, drug use and food consumption. Several versions were prepared and pre-tested before the final version was retained for use. It should be noted that the guidelines of the World Health Organization Consultation on Alcohol Epidemiology in Developing Societies were not available during this process. The standard measures of problematic alcohol consumption, based on a conference held under the auspices of the WHO in Mexico City in August 1998, were included in the questionnaire (SIAPAC, 1999). Unfortunately, some of these standard AUDIT questions were not included in the final questionnaire and the reference period and the response options of the questions were changed.

The interviewers were female and male social workers of the MoHSS. They were trained for a week to do the interviews. The staff of the

consulting company led the training sessions. Additional training was also offered during the fieldwork whenever required.

Field data collection, especially in the rural areas, was very demanding for the four teams, which carried out the work. Sometimes permissions to access their areas had to be obtained from the headmen, opinion leaders or the community leaders. Most farmers gave the team a permission to interview their farm workers, but only few owners (mostly white) of the commercial farms were willing to be interviewed. The interviewer in or near the respondent's household performed in-person interviews, usually in the presence (and hearing range) of other persons. Supervisors of the team checked the filled questionnaires directly while they were still in the area. Therefore, the interviewers could be sent back to the households, if they, for example, had skipped questions, which they were not supposed to omit. All questionnaires went through many checks before they were entered into the data file. The interviews were completed in the wintertime, between June and August 1998.

Measures of alcohol use

The Namibian questionnaire had no question addressing directly the frequency of alcohol use. We constructed a new variable on the basis of the time passed from the last drinking occasion. The variable was based on the following three questions: 'Over the past week have you drunk any drink with any alcohol of any type?', 'Over the past year, have you drunk any drink with any alcohol of any type?' and 'Have you ever drunk any drink with any alcohol in your life?'. In addition, questions concerning the amount of alcohol consumed over the past month were used. These questions were asked only to those respondents who had consumed alcohol during the past year. If the respondent had drunk any alcohol during the month, he or she was coded as a last-month drinker. Thus, our drinking frequency variable – last-drink frequency – has the following categories:

- Never (lifelong abstainers)
- Not over the past year (former drinkers but abstainers during the previous 12 months)
- Not during the past month but during the last year
- Not during the last week but during the past month
- During the last week.

Frequency of heavy drinking was asked as follows: 'How often have you had six or more units of alcohol (any type) on one occasion?'. The reference period for the question extended over the past three months. The question was asked if a respondent had had a drink within the past year (he or she was a current drinker). Instructions as to how to define units of alcohol (any type) were not given in the questionnaire, nor was the matter tackled during the training period of the interviewers. We converted the responses to the number of days in a year and recoded them as follows:

- Not during last year
- 1-11 times per year
- 1-3 times a month
- Weekly or more often.

Respondents were asked about their alcohol-related problems over the past three months and in their lifetime. The seven questions addressing alcohol-related problems over the past three months were as follows: 'How often have you experienced a time when you were not able to stop drinking during a single drinking session despite wanting to do so?', 'How often have you been unable to do something expected of you because you had too much to drink?', 'How often have you needed a first drink in the morning to get yourself going after a heavy drinking session?', 'How often have you had a feeling of remorse or guilt after drinking?', 'How often have you been unable to remember what happened the night before because you had been drinking?', 'How often have you skipped a meal because you drank alcohol instead?', and 'How often have you found it difficult to get the thought of alcohol out of your mind?'. Responses were the number of events during the past three months. For the analyses, we have recoded the responses as 1 or 0 to indicate whether the problem was experienced or not. Five questions were asked related to the life-long problems: 'Have you ever been injured as a result of drinking?', 'Have you ever been criticised by a family member for the amount of alcohol that you drink?', 'Have you ever broken up with a girlfriend/boyfriend/spouse/friend because of your

alcohol consumption?', 'Have you ever felt like you drank more than was good for you on a regular basis?' and, if a response was '*Yes*' to the latter question, 'Did you seek treatment of any type?'. Response categories were '*Yes*' and '*No*'.

Demographic variables

Weighted and unweighted distributions of all the demographic variables used in these analyses are presented in Table 1. Age (coded as '*18-19*', '*20-29*', '*30-39*', '*40-49*' and '*50 years or over*') was asked by using the straightforward question 'What is your age?'. Education was based on the respondent's highest education level. The following response options were given:

- No education
- Early primary (grades 1-4)
- Late primary (grades 5-7)
- Secondary (grades 8-12)
- Post secondary (>matriculation)
- Other.

For the analyses the education variable has been recoded into the following categories:

- None
- 1-6 years
- 7-12 years
- 13 years and over.

Marital status had the following two response options:

- Married or cohabiting
- Single. The latter option also included the engaged (but not yet married), separated, divorced and widowed persons. The occupation has been based on the following question: 'What is your usual occupation?'. The response options were as follows:
- Employed (formal employment)
- Unemployed and actively seeking work (has sought work at least once over past month)
- Self-employed/casual employed (own business, day-worker)
- Staying at home /subsistence agriculture (not actively seeking work)
- Student
- Other.

The idea embedded in the employment categories was to permit one to apprehend how freely respondents were able to use their time, hence the distinction between a formally employed and a casually employed respondent. A formal employee was tied down by his or her agreements with the employer, whereas a casual employee mastered his or her time and worked with whom and when he or she considered it suitable. Information on the sampling stratum permitted to group the respondents into urban and rural dwellers. Those living in the peri-urban areas (option 3) have been included in the rural category.

Representativeness of the data

The evaluation of the representativeness of the Namibian sample has been based on the latest census taken in Namibia, the 1991 Population and Housing Census (1995). The proportion of males in the sample was 35.9%. In the weighted data, the proportion of males was 47.6% which is in a better agreement with the proportion of the male population aged 15 years and over in the census (48.7%). Due to the weighting procedure the sample also represents well the populations of the different regions in Namibia. Middle-aged men (from 30 to 49 years) were under-represented and old men (60 years and over) over-represented. Young women aged from 20 to 29 years were considerably under-represented and middle-aged women (from 30 to 49 years) were over-represented in the sample. At the time of the census, 72% of the population in Namibia lived in rural areas. A somewhat lower percentage (68%) of the rural population in weighted data is well in accordance with the census figure, when net immigration to towns and cities in the 1990s is taken into consideration. 42% of the population aged 15 years and over in the census data were married (legally or in a consensual union). In the survey data, the proportion of those married is exactly the same as in the census. The proportion of

those who never attended school is lower (17 vs. 26 per cent), and the proportions for all the categories of educational attainment were higher in the survey data than in the 1991 census for those aged 15 years and over. The main reason for this discrepancy is the rising level of educational attainment in Namibia, but the differences in the age ranges and educational categories between the survey data and the census can also partly explain the difference. In any case, both the census and the survey show that more men than women have never attended a school. All in all, we conclude that the sample of the alcohol survey is fairly representative of the Namibian population.

Results

Abstaining and drinking frequency

More women than men were classified as lifelong abstainers or last year abstainers (Table 2). The proportion of women abstaining from alcohol use since at least one year is 53%, and the respective figure for men is 39%. The 1998 Namibian survey suggests that only 47% of men and 61% of women had drunk alcohol during the year preceding the interviews, but a great majority of them (70%) had used alcohol during the preceding week. Thus, it seems that those Namibians who had decided to use alcohol had done so frequently.

The youngest men (those aged from 18 to 19 years) drink less frequently than men in other age categories, which in turn, show no systematic differences in the frequency of abstaining or drinking. Among women, those aged from 20 to 29 years show the highest proportion of abstainers and the lowest drinking frequency, while those aged from 40 to 49 years drink most frequently. Differences in the drinking frequency are quite small between other age groups. Married men are more often abstainers and they drink less frequently than the single ones, (which include engaged and divorced men and widowers). Among women, the opposite is true; single women are more often abstainers or infrequent drinkers than their married sisters are.

Among both men and women, abstaining and infrequent drinking are most common in the highest education category (13 years and over). Also, drinking frequency is negatively associated with education level. Differences in the age structure between the educational groups, however, may explain this tendency. There is no similar tendency among men. Employed men show the highest proportion of abstainers and the lowest drinking frequency, when men in different occupational categories are compared. Differences in the drinking frequency are small between all the other occupational groups. Self-employed women and female day-workers are less likely abstainers than women in the other occupational groups. Self-employed and day-worker drinkers, as well as drinkers working at home or practising subsistence agriculture also use alcohol more frequently than women in the other occupation groups. The gender differences are more substantial in the occupation strata than in the other factors considered above. Unlike the situation prevailing in many industrialised countries, in Namibia urban people are more frequently abstainers and they use alcohol less frequently than the people living in the rural areas. The difference is particularly large for women.

The most striking finding with regard to abstinence and the frequency of alcohol use is the existence of two distinct groups with totally opposite relationship with alcohol. The dichotomy in both men's and women's behaviour prevails even when the genders are divided into various socio-demographic categories. The figures in Table 2 clearly suggest that in Namibia the main alternative of being a total (or virtually total) abstainer is to be a regular drinker. This distinction appears to be more clear-cut for women than for men.

Heavy drinking frequency

Not surprisingly, heavy drinking in Namibia is more common among male than female drinkers (Table 3.). The proportion of drinkers who had drunk heavily (six or more units) at least on one occasion during the past year is 46% for men and 27% for women. 26% of men and 15% of women had drunk heavily at least once during the last month. Only 2% of the male and female drinkers reported that they drink heavily weekly or more often.

For both men and women, heavy drinking is most uncommon among the youngest and the oldest age groups. It seems that heavy drinking increases by age up to ages 30-39 for women and up to ages 40-49 for men. So, men from ages 40 to 49 years have the highest frequency of heavy drinking, while for women heavy drinking is most common at 30-39 yea of age. Married male and female drinkers have six or more units on one occasion more frequently than do their single counterparts, but for women the difference is small. Both women and men drinkers who have never attended school drink heavily most frequently of any educational category. No consistent differences can be seen between the other educational groups.

Among men, heavy drinking is most frequent among those employed, and among those at home

or practising subsistence agriculture, whereas the heaviest drinkers among women are those self-employed and day-workers (casually employed). In fact, in the self-employed and day-worker categories women drinkers were more frequently than men drinkers (28% vs. 23%) recorded to have drunk six or more units on one occasion at least once a month. In both genders, heavy drinking is most uncommon among the students. The urban Namibians drink heavily more frequently than the rural dwellers.

All in all, the difference between the genders in heavy drinking is surprisingly small, and the patterns of heavy drinking are quite similar when the genders are compared within the various socio-demographic variables. The most striking differences in heavy drinking between men and women were found in different occupation categories.

Types of alcohol consumed

In Namibia home-brewed beer is the most significant type of alcoholic beverage. Even after all the consumed alcohol is converted into absolute alcohol, home-brewed beer accounts for 67% of the total consumption. The proportions of the other types of alcoholic beverages are in the order of preference as following: store-purchased beer 15%, store-purchased hard liquor 10%, home-brewed hard liquor 6%, and wine 2%. Men in Namibia consume smaller portion of their total alcohol consumption (in absolute alcohol) as home-brewed beer when compared to the women (73% vs. 64%). Furthermore, store-purchased alcoholic beverages constitute a larger portion of men's consumption than that of women's.

Problems related to alcohol use

Respondents were asked about their alcohol-related problems both over the past three months and over their lifetime. The questions focusing on the past three months constitute a part of the so-called AUDIT questions, which have been developed to detect early stages of alcohol dependence. The questions referring to the lifetime problems cover separate topics. Both kinds of problems are more common among men than among women.

Altogether, nearly half of the male and one fourth of the female respondents have reported that they had experienced at least one of the seven problem options during the past three months. The same figures are 75% for male drinkers and 60% for female drinkers. 9% of male drinkers and 5% of female drinkers had experienced all of the seven problem options at least once during the past three months. The prevalence of the different problems varies from 19 to 33% for all men and from 9 to 19% for all women, while the respective ranges for male drinkers are from 31 to 53% and for female drinkers from 19 to 40% (Table 4.). Among both men and women feeling of remorse and guilt after drinking are the most common harm experiences of all the listed alcohol problems when the period of the past three months is concerned.

Almost as many drinkers had reported as their life-time experience that they had felt like 'drinking more than was good' as had reported having felt 'remorse and guilt' during the past three months. The small difference may well suggest that the respondents in Namibia have underreported their lifetime problems related to alcohol use. A possible exception is the proportion of those men and women drinkers (4%) who had sought treatment sometimes during their lifetime.

Discussion

In this article we have examined drinking habits and problems related to alcohol use in Namibia. The data used was the first Nation-wide KAP baseline survey on alcohol and drug use and abuse carried out in the country. The survey was intended to provide an information base in order to plan a national program and to develop policies for prevention of alcohol abuse in Namibia. The target population of the survey was those Namibians (about 40% of the total population) who had reached the legal age (18 years) to drink alcohol. However, alcohol use, particularly drinking of home-brewed beer, is very common even among those who are underage. Parents may offer beer to their small children as food. Living in a hot climate makes it imperative to be able to quench one's thirst. Fermented beverages offer a safer alternative than water that is often contaminated by parasites (Partanen, 1991). The local consumers often view home-brewed beer as food, rather than as a beverage (see Swantz, 1985; Skjelmerud, 1999).

The results of the study showed that abstaining is common among Namibians aged 18 years or above. Less than one half of women and about 60% of men had drunk alcohol during the past year. Most alcohol (67%) is drunk as home-brewed beer. Both male and female drinkers were shown to have drunk rather regularly and about one-fifth of the drinkers had drunk heavily (six or more units) on one occasion at least once a month or more often. The prevalence of alcohol-related problems is rather high among the drinkers.

The high proportion of abstainers, high levels of alcohol intake, the popularity of traditional beverages and the high prevalence of alcohol-related problems are all findings which fit quite well to the pattern which earlier has been seen to characterise African drinking (e.g, Partanen, 1991; Parry & Bennetts, 1998). The relatively low frequency of heavy drinking, however, does not fit to the standard dichotomy, the 'all-or-none' pattern, which has also been seen to characterise the African drinking habits (Partanen, 1991), even in Namibia (Skjelmerud, 1999). Those drinkers who follow the African pattern would consume a lot when they drink, with only a few exceptions, or alternatively choose to abstain, or at least refer to themselves as non-drinkers. The present Namibian survey suggests that instead of the 'all-or-none' pattern the prevailing behaviour can be labelled as the 'none-or-frequently' pattern.

Descriptions of the African drinking pattern do not specifically address women's behaviour in this context. Studies done in different African countries have reported that women drink less alcohol than men and experience consequences of its use to a lesser extent (e.g. Wilsnack & Wilsnack, 1997; Partanen, 1991; Parry & Bennetts, 1998). Based on several studies done in South Africa Parry and Bennetts state that "On average, alcohol consumption rates appear to be 15% to 20% higher for men than for women in all race groups" (Parry & Bennetts, 1998). Thus, the South African findings, as well as the results based on the Namibian survey, indicate that women consume a relatively large portion of alcohol, suggesting that gender differences in parts of Africa, at least, are smaller than in the developed western countries. On the other hand, as we have seen, women's alcohol consumption varies considerably between occupational groups. Women working at home or at subsistence agriculture, or who are self-employed or casually employed have a consumption pattern which resembles those of the men. Women in these occupations constitute three fourths of all women aged 18 years or above and they are often significant producers of home-brewed beer. There is a natural explanation why the producers consume their own products frequently and in large amounts. In Namibia, as well as in many other African cultures, the producer or trafficker of beer has to have the first drink in order to show sociability and prove that the product is adequate, and what is even more important, not poisonous. Thus, cultural factors easily turn a producer of beer into a heavy drinker.

Some known problems related to the Namibian survey arouse certain reservations about the validity of the results. Firstly, the prevalence of abstainers may be overestimated. The prevalence of abstaining and the frequency of drinking were based on a hierarchical series of questions, which detected the time that had passed after the last drinking occasion. The problem is that the questionnaire did not indicate at this point what an alcoholic beverage meant. In Namibia, as is the case in many other

parts of Africa, home-brewed beer may sometimes be viewed food rather than an alcoholic beverage. This may have led the respondents to underreport (the frequency of) their alcohol use. Furthermore, the "abstainers / frequent drinkers" dichotomy, which prevails in all the demographic categories, may indicate that when many of the respondents had said that they had not drunk during a given period of time, they had understood drinking in the "African way", in other words, in terms of getting drunk (see Skjelmerud, 1999). These respondents may have disregarded their ritual and ceremonial use of alcohol, because the intention had not been to get drunk. Consequently, they had not considered themselves as drinkers. The low prevalence of infrequent drinking supports these conclusions. Thus, the dichotomy may correspond better to the dichotomous attitude towards the patterns of alcohol use than the factual abstaining or the frequency of drinking. All in all, the prevalence of current drinkers should be considered as a minimum value. If this conclusion is correct and infrequent drinkers are underrepresented in the data, our results based on the drinkers overestimate the prevalence of heavy drinking, and the prevalence of problems related to alcohol use in Namibia. So, our results concerning these issues would overrate the existence of the African dichotomy in the Namibian drinking habits.

Secondly, the prevalence of heavy drinking may be based on rather arbitrary criteria, because no instructions on how to define units of alcohol (of any type) were given in the questionnaire, nor were such instructions given to the interviewers. We can only imagine what kinds of units of alcohol the respondents used. They may have used for example quantities (1000ml, dumpies, nippies, and glasses) that had been mentioned at an earlier stage of the interview when consumption of alcohol during the past week or the past month was inquired. If the respondents have used such quantities, their responses could have a sound base. Our results show that among women, heavy drinking becomes slightly more frequent as drinking frequency rises but among men, frequencies of heavy drinking are the same for those drinkers who had drunk during the last week than for those who had drunk during the last month but not during the last week (the detailed results have not been presented here). We have also examined the relationship between the frequency of heavy drinking and the prevalence of problem experiences related to alcohol use (the detailed results have not been presented here). Our results show that, with some exceptions, the prevalence of the alcohol-related problems increases as the frequency of heavy drinking rises. Therefore, we find it justified to believe that the responses, indeed, have a sound base. Nonetheless, it is likely that particularly men have underreported their frequency of heavy drinking. On the other hand, we have concluded above that some of the abstainers in the Namibian data are actually (infrequent) drinkers, thus resulting in an overestimated frequency of heavy drinking. All in all, because of these uncertainties in the opposite directions, the results concerning the frequency of heavy drinking among different groups of the population should be considered only tentative.

Thirdly, our estimates of the annual consumption of alcohol are sensitive to the measures of alcohol content, particularly for home-brewed beer. Traditional alcoholic beverages in Africa can differ considerably from one another regarding their alcohol content. We have chosen to use the conversion factor of 3% (of volume) for home-brewed beer, which may well be an underestimate (see e.g. Kortteinen, 1989; Maula, 1997; Partanen, 1991). Therefore, the conversion factor should not result in inflated figures for annual alcohol consumption or overestimate the significance of home-brewed beer among the target population of Namibia. There are no relevant alcohol sales statistics in Namibia, which could be used to verify the 'true' consumption levels. Yet, we have no reason to believe that the Namibian respondents would be less prone than the respondents in the economically developed countries to forget or conceal their own alcohol use. In the Namibian data, the high prevalence of alcohol problems over the past three months is consistent with the estimated high levels of alcohol intake.

It is nearly impossible to say anything about the trends in alcohol consumption in Africa (Partanen, 1991). Several processes are taking place in Namibia, which may have an impact on alcohol consumption, and these impacts can have opposite

directions. The results of this study have shown that the rise in the level of educational attainment, the increased possibilities of getting formally employed and more generally, the widening of the formal sector may reduce the drinking frequency. The results have also shown that, unlike in industrialised countries, urban people in Namibia are more frequently abstainers and use alcohol less frequently than people living in rural areas. Therefore, urbanisation may reduce the drinking frequency and increase the proportion of abstainers. On the other hand, intra-urban differences may also be large. The heterogeneity among the urban populations with regard to such factors as the length of time lived in the urban area, poverty, access to alcohol and marketing practices may have an impact on alcohol consumption. Many studies have shown that among the more recently urbanised populations, who also tend to live in less formal housing, alcohol consumption is higher and problems related to alcohol use are more common than among those who live in more formal housing. Many factors, such as age, gender and drinking patterns can, however, mediate this relationship (Parry & Bennetts, 1998). The present data do not allow for examination of intra-urban differences in Namibia. Neither was regional or ethnic differences in alcohol use, which can be quite large in Namibia, considered in this article.

In Africa, the relative affluence has resulted in a transformation towards commercially produced alcohol, beer in particular (Partanen, 1991; Kortteinen, 1989; Maula, 1997). The 'modern' commercial drinks are seen as markers of success, while home-brewed beer (especially 'tombo') is linked to poverty. Namibia is not an exception in this respect but domestic production is still the dominant channel of availability of alcohol in Namibia. The new Liquor Sale Act of 1999, which legalized manufacturing of any alcoholic beverage which does not contain more than three per cent of alcohol by volume, even for the purpose of selling, will probably not signify any big changes in terms of production of home-brewed beer.

All in all, the net result of all the various sources of uncertainty and error – known or unknown – is that the findings from the first Namibian alcohol survey fit quite well to the pattern which have been seen to characterise African drinking in previous studies. The reservations about the findings of this study, particularly those concerning the prevalence of abstaining and the dichotomy in the drinking habits, may be relevant even regarding many earlier studies on African drinking. Therefore, future carefully designed studies on alcohol use are needed in Namibia, as well as in other countries of Africa. In these studies, knowledge of the local cultures, sensitivity to cultural differences, regarding the meaning of drinking for instance and knowledge of the field of alcohol studies should go together hand by hand and support one another.

The findings of this study also reflect the manifold links between alcohol and women in Namibia. Many of them are important producers of alcohol but they are also significant consumers of these products while following the customs dictated by the culture. By doing so, they bear the consequences of their own alcohol consumption, as well as of the consumption of their family members. Namibia will face a difficult challenge while trying to diminish the harmful effects of alcohol use and women's burden related to alcohol. In the long run, only the growth of formal sectors coupled with waged employment, and elevated levels of education can create realistic possibilities for changes in the living conditions of both women and men in Namibia, and hereby change the role of alcohol in their lives.

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Table 1

Distribution (%) of weighted and unweighted sample demographic characteristics

CHARACTERISTICS	MALE		FEMALE	
	UNWEIGHTED n=1017	WEIGHTED n=392841	UNWEIGHTED n=18127	WEIGHTED n=432432
AGE				
18 – 19	8.3	9.5	7.2	7.5
20 – 29	33.6	33.0	29.1	27.7
30 – 39	20.3	18.2	24.0	23.2
40 – 49	12.1	11.7	16.6	16.9
50 and over	25.8	27.6	23.1	24.7
EDUCATION				
None	19.8	19.3	13.5	14.8
1 – 6	32.0	33.9	35.6	39.6
7 – 12	40.1	40.3	43.0	40.4
13 and over	8.1	6.5	7.9	5.2
OCCUPATION				
Employed (formal employment)	31.4	26.6	17.1	12.7
Unemployed	12.4	11.0	8.2	6.7
Self-employed/casually employed	14.5	12.6	11.1	8.9
At home/subsistence agriculture	34.8	40.2	58.5	66.2
Student	7.0	9.6	5.0	5.5
MARITAL STATUS				
Married	44.2	45.3	38.0	39.8
Single	54.8	54.7	62.0	60.2
STRATA				
Urban	43.6	34.5	50.9	29.2
Rural	56.4	65.5	49.1	70.8

Table 2

Drinking frequency (based on the last drinking occasion) (%) by socio-demographic characteristics

SOCIO-DEMOGRAPHIC CHARACTERISTICS			n	LIFITIME ABSTAINERS	LAST YEAR ABSTAINERS	LAST YEAR	LAST MONTH	LAST WEEK
		OVERALL	2823					
		GENDER						
		Men	1012	24.5	14.6	6.1	12.0	42.8
		Women	1811	35.6	17.3	7.1	8.2	31.
AGE	MEN	18-19	83	32.4	4.3	10.5	16.7	36.0
		20-29	339	25.2	13.3	6.0	11.9	43.6
		30-39	205	23.5	14.5	4.9	14.9	42.2
		40-49	123	23.4	15.6	5.3	9.4	46.3
		50 and over	261	22.3	19.2	5.9	9.7	42.9
	WOMEN	18-19	131	38.9	9.9	13.0	6.3	31.9
		20-29	526	43.7	17.5	10.8	8.0	20.0
		30-39	434	32.7	18.9	6.9	7.1	34.6
		40-49	299	27.6	14.7	4.1	11.0	42.6
		50 and over	419	33.8	19.7	2.8	8.3	35.4
MARITAL STATUS	MEN	Married	457	25.9	17.5	5.9	9.6	41.1
		Single	555	23.4	12.2	6.3	14.0	44.2
	WOMEN	Married	688	36.4	15.4	4.4	7.1	36.7
		Single	1121	35.0	18.5	8.9	9.0	28.5
EDUCATION	MEN	None	201	26.3	15.9	5.0	14.9	38.0
		1 – 6	325	23.7	14.3	7.4	9.9	44.6
		7 – 12	404	24.0	13.0	5.6	12.7	44.7
		13 and over	82	27.0	21.3	6.0	10.1	35.6
	WOMEN	None	245	35.5	17.6	4.6	11.5	30.8
		1 – 6	644	26.3	19.0	5.4	8.8	40.5
		7 – 12	778	43.1	15.5	10.0	6.6	24.9
		13 and over	144	48.0	16.8	4.2	7.9	23.1
OCCUPATION	MEN	Employed (formally)	317	33.1	13.6	6.1	12.2	35.1
		Unemployed	126	30.8	7.3	3.7	17.3	40.9
		Self-employed / casually employed	146	20.0	17.2	3.5	11.1	48.2
		At home /subsistence agriculture	353	19.3	16.6	6.2	12.2	45.7
		Student	69	21.5	13.8	12.1	5.7	46.8
	WOMEN	Employed (formally)	309	47.0	19.6	6.9	8.3	18.3
		Unemployed	148	57.7	15.2	4.3	5.9	16.9
		Self-employed / casually employed	199	32.5	15.4	7.9	4.7	39.5
		At home /subsistence agriculture	1058	31.2	17.3	6.4	9.3	35.8
		Student	91	40.4	17.1	18.3	4.5	19.7
AREA	MEN	Urban	441	35.4	14.5	3.9	7.3	39.0
		Rural	571	18.8	14.6	7.3	14.5	44.8
	WOMEN	Urban	921	55.2	17.9	4.8	4.5	17.7
		Rural	890	27.5	17.0	8.1	9.8	37.7

Table 3

Frequency of heavy drinking (%) by socio-demographic characteristics among current drinkers

SOCIO-DEMOGRAPHIC CHARACTERISTICS			n	NOT IN THE PAST YEAR	1-11 TIMES PER YEAR	1-3 TIMES A MONTH	WEEKLY OR MORE
		OVERALL	1186	55.9	19.5	22.3	2.3
		GENDER					
		Men	547	54.4	19.9	23.6	2.1
		Women	639	73.3	11.8	13.0	1.9
AGE GROUP	MEN	18-19	40	67.4	13.4	17.8	1.4
		20-29	178	53.8	17.2	26.0	3.0
		30-39	117	43.3	31.4	24.6	0.7
		40-49	70	46.06	18.5	27.4	7.5
		50 and over	131	60.6	17.9	21.5	–
	WOMEN	18-19	44	80.9	9.5	6.1	3.6
		20-29	131	71.7	13.2	13.2	1.9
		30-39	165	66.7	13.6	16.5	3.1
		40-49	126	68.2	16.4	14.0	1.4
		50 and over	122	81.9	6.0	11.4	0.7
MARITAL STATUS	MEN	Married	228	47.3	22.7	27.9	2.2
		Single	309	59.1	17.9	21.0	2.1
	WOMEN	Married	248	70.3	13.2	14.5	2.0
		Single	337	74.9	11.0	12.2	1.9
EDUCATION	MEN	None	103	54.1	13.0	29.5	3.5
		1 – 6	178	60.5	18.4	19.7	1.4
		7 – 12	216	49.0	23.9	25.0	2.1
		13 and over	40	52.6	22.2	22.6	2.6
	WOMEN	None	85	62.8	15.1	21.0	1.2
		1 – 6	255	73.7	11.5	13.6	1.3
		7 – 12	240	75.9	11.1	9.9	3.1
		13 and over	46	79.5	10.6	8.2	1.8
OCCUPATION	MEN	Employed (formally)	160	43.3	26.1	28.3	2.3
		Unemployed	70	56.4	20.9	20.4	2.3
		Self-employed / casually employed	80	51.8	25.0	23.2	–
		At home /subsistence agriculture	193	57.0	16.1	24.0	2.9
		Student	33	67.8	12.9	18.0	1.3
	WOMEN	Employed (formally)	92	62.8	21.5	11.7	4.0
		Unemployed	40	59.6	24.6	14.0	1.8
		Self-employed / casually employed	75	61.7	10.1	18.9	9.3
		At home /subsistence agriculture	391	75.6	10.5	13.0	0.8
		Student	26	87.5	8.3	4.2	–
AREA	MEN	Urban	216	42.1	25.9	28.7	3.2
		Rural	321	58.8	17.5	22.0	1.7
	WOMEN	Urban	240	60.4	16.2	20.8	2.5
		Rural	386	75.6	11.0	11.6	1.8

Table 4

Prevalence of alcohol-related problems (%) among all respondents and drinkers

DRINKING PROBLEMS	ALL RESPONDENTS		DRINKERS	
	MEN n=1012	WOMEN n=1811	MEN n=548	WOMEN n=639
OVER THE PAST THREE MONTHS				
Unable to stop drinking	24	13	40	28
Unable to do something expected	21	13	35	29
Needed a drink first in the morning	22	9	37	18
Feeling of remorse and guilt after drinking	33	19	53	40
Unable to remember what happened	19	9	31	19
Skipped a meal because of drinking	26	11	42	23
Difficulties getting alcohol out of mind	27	14	44	31
DURING LIFETIME				
Injured	–	–	25	12
Criticised by family	–	–	54	31
Broken up with friend or spouse	–	–	19	10
Felt like drinking more than was good	–	–	55	45
Has sought treatment	–	–	4	4

Biography

Heli Mustonen

She is a Senior researcher at the Alcohol and Drug Research, STAKES in Helsinki, Finland. Her major subject at the University of Helsinki was social policy. She started her scientist career as a demographer at the Population Research Institute, The Finnish Population and Family Welfare Federation, Helsinki, in 1981. In 1985 she shifted to the field of alcohol studies when she joined the Social Research Unit for Alcohol Studies. Dr Mustonen's main research areas are drinking habits, changes in drinking habits over time and experiences related to alcohol use. Dr Mustonen (with Dr Jussi Simpura) was in charge of the 2000 Finnish Drinking Habits Survey.

Ludwig Beukes

He is a Social worker. Dr Beukes managed the Nationwide KAP baseline Survey on Alcohol and Drug Use and Abuse in Namibia in 1998. At the time of the study, He was a coordinator of the Alcohol and Drug Resource Centre in the Ministry of Health and Social Services. He was a member of the National Drug Control Commission in Namibia 1997-1999. In 1999, he was sponsored by the social development cooperation project, Health and Social Sector Support Program (HSSSP/Finland) to visit Finland for a period of six weeks. He is a founder member of the Blue Cross in Namibia (1999).

Verona Du Preez

She is a Social worker at the Ministry of Health and Social Services in Windhoek, Namibia. Her main field is related to substance abuse: prevention, treatment, research, and aftercare. At the time of the first Nationwide KAP baseline Survey on Alcohol and Drug Use and Abuse, she worked at the Alcohol and Drug Resource Center. She participated in the planning process of the study and was one of the interviewers. In 1999, she spent in Finland a period of six weeks supported by the social development cooperation project, Health and Social Sector Support Program (HSSSP/Finland).

Household survey of alcohol use in Nigeria:

The Middlebelt study

NIGERIA

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Background

With an estimated population of 107 million, Nigeria is the most populous country in Africa. The population consists of people belonging to more than 200 ethnic and linguistic groups. More than 50 percent of Nigerians are below the age of 20 years and, even though the urban population has been growing rapidly in recent years, most Nigerians live in rural areas. After 76 years as a British colony, Nigeria became an independent country in 1960 with a parliamentary form of government. In 1966 the first post-colonial civilian government was toppled in a military coup and in the following year, the country was thrown into a civil war that lasted till 1970. With its initial incursion into governance after the coup of 1966, the military has ruled the country for all but 10 years of its history. Today, Nigeria is almost totally dependent on oil revenues. The industrial sector has been in decline for a decade and income per capita has fallen sharply from more than $1,000 in the early 1980s to a few hundred dollars today. In this situation of general economic downturn, the alcohol sector has not been adversely affected and Nigeria is home today to numerous breweries, distilleries and a very active commerce in traditional and western style alcoholic beverages.

In its traditional forms, alcohol has played a central role in many Nigerian societies for centuries. Beginning from early traditional settlements to present social contexts, drinking of some form of intoxicating drinks has been a feature of life transitions, from birth to death. Alcoholic beverages are produced from a variety of plants and food grains in different parts of the country. Palm wine is tapped from the raffia and oil palm trees that grow in large numbers in the southern parts of Nigeria. *Burukutu* and *pito* are produced from several grains, including Soya beans, millet and guinea corn, which are food staples grown in Northern Nigeria, especially in the "Middlebelt" (or central) region of the country. These beverages are usually consumed in the areas in which they are produced. Without adequate refrigeration, which is required during transportation from one part to another, fermentation easily sets in and the drinks lose their freshness and natural taste. Fermented beverages serve as raw material for the distillation of a gin-like beverage known as *ogogoro* in the south and *kinkana* in some parts of the north. This product is consumed all over the country because, as liquor, it has an indeterminate shelf life and is transported easily from the south, where most of it is produced, to all parts of the country. During the colonial era, *ogogoro* was declared an illicit gin and banned by the British administrators.

While these traditional drinks remain popular in both urban and rural areas, there is today a dizzying array of modern alcoholic beverages everywhere in the country. Nowhere is it difficult to find beer, wine, and liquor produced locally or imported from abroad. The alcohol industry in Nigeria has remained very robust since the 1970s. For example, the decade began with a handful of breweries but by the early 1980s there were more than twenty. The increased production of beer that these breweries recorded has been accompanied by increased consumption and higher prevalence of alcohol consumption by adolescents and young adults (Obot, 1990, 1993a, 1993b, 1996; Adelekan, 1989; Odejide *et al.*, 1987). From a situation in which alcohol was generally consumed in communal settings and adults exerted social controls on drinking by young people, the country is currently faced with the reality of heavy alcohol use and alcohol-related problems in both rural and urban areas.

Subjects and methods

Study sample

The study was conducted in 1988/89 in what is loosely known as the "Middlebelt" region of Nigeria. This region is situated between the northern and southern parts of the country and is home to a diversity of ethnic, religious and cultural groups. The study was sponsored by the Centre for Development Studies, University of Jos, Nigeria, as part of a research program on development issues in the University's catchment area of central Nigeria.

The major objectives of the study were as follows:

- to assess the extent of alcohol consumption in a general population of Nigerians;
- to determine the types of alcoholic beverages consumed and the demographic factors associated with alcohol use;
- to assess the nature of psycho-social problems associated with heavy alcohol use;
- to assess beliefs, attitudes and community norms concerning drinking.

The study sample was obtained from three states selected to reflect the religious and ethnic diversity of the population in the study area using the sampling frame of the Federal Office of Statistics (FOS). This sampling frame uses a multistage, area probability design, which has been standardized by the FOS in its National Integrated Survey of Households (NISH). After the three states were selected, the sampling process continued with the selection of local government areas (LGAs) within the states, enumeration areas, households, and finally, the participant within the household. The respondent in each household was the head of the household, or the oldest person at home after three failed repeated attempts to interview the head of household.

Using this method, a total of 1925 respondents were selected for the interview. Each face-to-face interview was conducted by an experienced and trained interviewer from the Federal Office of Statistics who was resident in the same enumeration area as the respondent. A questionnaire designed specifically to achieve the objectives of the study and pre-tested in one of the three states was used to collect data on pattern of alcohol consumption, consequences of drinking, attitudes and norms, and community responses to drinking. The final sample consisted of 1562 respondents (1404 males and 158 females), 363 respondents having been excluded due to incomplete interviews. This report is based on the data collected from the 1404 males in the sample. Females have been excluded because they were too few.

Measures

Patterns of alcohol consumption

Patterns of alcohol consumption were assessed using several questions on drinking of beer, traditional beverages (e.g., palm wine, *ogogoro, burukutu, pito*), wine and liquor. The questions were adapted from the works of Ritson (1985) and Moser (1985).

Self-description

In the first question, respondents were asked to describe themselves in relation to their use of alcohol. Categories of self-description were as follows:

- Non-drinker (abstainer)
- Past drinker
- Infrequent drinker
- Light drinker
- Moderate drinker
- Heavy drinker.

Type of alcohol usually consumed

Respondents were then asked to identify their preferred drink. Categories of response were the following:

- Non-drinker
- No usual drink / drink all equally
- Traditional beverages, liquor, wine or beer.

Drinking frequency

The question on drinking frequency sought to assess how often alcohol was consumed. Participants responded to the question "How often do you drink any type of alcohol?" using the following response categories:

- Don't drink alcohol
- Not in the past year

- Less than once a month
- 1-3 times a month
- Once or twice a week
- 3-4 times a week
- Nearly everyday
- Once a day
- Two or more times a day.

In the analysis for this paper, the responses were recoded as follows:

- Abstainer (Categories 1 and 2)
- Less than once a month (Category 3)
- At least once a month (Category 4)
- At least once a week (Categories 4 and 6)
- Nearly every day / every day (Categories 7, 8 and 9).

Based on these categories, a current drinker was a respondent who had consumed an alcoholic beverage at least once in the 'past year' (Categories 2-5). A current abstainer was a respondent who had never taken alcohol or who had not consumed any alcoholic beverage in the past year (Category 1).

Quantity consumed

The quantity of alcohol consumed on a typical drinking occasion was assessed for each type of alcoholic drink. Beer was measured in bottles, traditional beer in calabashes (later converted to bottle equivalents) and liquor in shots. A typical bottle of beer in Nigeria is 60 cl. (roughly equivalent to two typical bottles of beer in many parts of the world). In addition, respondents were asked to state how much alcohol they could drink without getting drunk.

The variable 'Heavy drinking' was created from the frequency and quantity variables. Heavy drinkers were those who took at least five drinks (about three bottles of beer) in one sitting at least once a month. Only beer drinking was used in determining this variable because beer was the typical drink for the great majority of drinkers and provided the most reliable measure of quantity in terms of volume and alcohol content. Measures of traditional beverages and the alcohol contents of *burukutu, pito* and *ogogoro* are particularly variable and unreliable.

Consequences of drinking

One of the major objectives of this population survey was to assess the health and social consequences of heavy alcohol consumption. Respondents were, therefore, asked how often they had experienced a series of psychosocial problems and whether they had ever suffered from a number of health problems.

Psycho-social problems

Because there was no direct reference to the role of drinking in many of the problems included in the questionnaire, only selected consequences were used in the analysis for this paper. These were the following:

- Felt that you should cut down or stop drinking altogether
- Have taken a drink first thing when you got up in the morning
- Felt the effects of alcohol while at work
- Got into a fight with others
- Have been involved in a road traffic accident
- Experienced serious disruption in your family
- Have been in debt because of drinking
- Have been told to leave a place because of your drinking
- Got into trouble with authorities because of your drinking
- Gone without other things because of the cost of alcohol
- Sometimes get drunk even when there is an important reason to stay sober.

For these problems, response categories were:

- Daily or nearly daily
- At least once a week
- A few times a month
- Less than once a month
- Never
- Not applicable.

In addition, responses were sought for the following questions:
Some people worry or feel guilty about their drinking even when they may have no reason to. How much do you worry (or have worried) about your drinking, or the long range consequences of your drinking? Response categories for this question were:

- A lot
- A little
- Not at all
- Doesn't apply.

Have you ever tried to stop drinking entirely?, for which the responses were:

- Yes, once
- Yes, more than once
- Never
- Doesn't apply.

For this paper, the responses were recoded into two categories – '*Yes*' for ever experiencing the problem and '*No*' for never experiencing the problem.

Demographic characteristics

Males were over-represented (90%) in the sample because in the selection of respondents, priority was given to heads of household. This analysis is therefore limited to male respondents. Respondents gave their actual or estimated age at the time of the interview. This variable was later recoded as follows:

- Missing
- 19 years or less
- 20-29 years
- 30-49 years
- 50 years and above.

Education was assessed with a question on the highest level of education attained. The responses were coded as follows:

- No formal education
- 1-8 years (primary school)
- 9-13 years (secondary school)
- 14 years and above (at least some higher education).

The dataset also included information on religious affiliation ('*Christian*', '*Muslim*', '*Other*'), participation in religious activities, occupation, annual income, marital status and number of children. This paper includes information only on religion and income.

The Federal Office of Statistics has three categories to describe urbanization – urban, semi-urban, and rural. Because we did not initially code urbanization, we used information about respondents' local government areas (LGAs) in the dataset to construct the rural-urban variable. LGAs in state capitals of each of the three states and one large city in one state were coded as urban while all other LGAs were coded as rural.

Attitudes and norms

In an attempt to understand how communities in the study area viewed drinking by youth and adults, males and females, or the norms about drinking, respondents were asked to rate situations involving drinking by different members of the community as '*Acceptable*', '*Not acceptable*' and '*Not sure*'. The situations were as follows:

- Missing A boy/girl of 16 years or less drinks alcohol at a social function
- Missing A boy/girl of 16 years drinks with friends in a bar
- Missing A boy/girl drinks at home
- Missing A young man/woman of 21 drinks with friends
- Missing A man/woman of 40 years drinks with friends
- Missing A man/woman of 40 years gets drunk occasionally
- Missing A teacher or office worker gets drunk at work
- Missing A high government official drinks heavily

Respondents were further asked to indicate whether they agreed or disagreed with or were not sure about the following statements concerning drinking and drunkenness:

- Missing A man's drinking is his own business and no concern of the community
- Missing A man who is always drunk should be punished
- Missing If a man drinks and does not support his wife and children, the community should intervene.

Finally, two sets of items were included in the questionnaire to assess reasons for drinking and not drinking, or not drinking more than at present. Among the stated reasons were the following: costs, interference with work, health hazard, taste of alcohol, fear to become a drunkard and so on.

The first questions addressed reasons for drinking and were rated by respondents as '*Very important*', '*Important*' or '*Not important*'. These categories were dichotomized as '*Important*' and '*Not important*' and the analysis of the reasons for drinking was limited to drinkers only. A separate analysis was conducted for reasons for not drinking at all or for being careful about drinking among drinkers and nondrinkers.

Results

There were 756 drinkers and 648 non-drinkers in the sample of 1404 males. Half of the respondents were in the 30-49 age group, 72% were in the lowest economic group, 53% were Christians and 40% Muslims; 61% lived in rural areas. Among drinkers, the most popular type of beverage consumed was beer (43%), followed by '*No usual drink, drink all equally*' (27%) and traditional beer (21%). Relatively few chose liquor (6%) and wine (3%) as the "usual drink". Most drinkers (65%) reported the consumption of five or more drinks (equivalent to three bottles of beer) per drinking occasion.

The frequency of drinking by age, educational attainment, income and rural-urban residence is shown in Table 1. The highest proportions of beer drinkers were between the ages of 20 and 29 years and the least was among respondents who were 50 or more years old. As would be expected, most Muslims (66.3%) were abstainers while only 27% of the Christians reported not drinking any type of alcohol at least in the year preceding the survey. The proportions of abstainers among rural and urban residents were about the same (i.e., 42.2% and 41.5% respectively).

Table 2 shows the prevalence of heavy drinking among drinkers. Overall, there were 265 light drinkers, 491 heavy drinkers and 648 non-drinkers (including missing data). More than 60% of drinkers in all age groups reported drinking five drinks per occasion at least once a month. Heavy drinking was also more frequently reported in urban areas and among people with higher levels of education and income. As shown in Table 3, heavy drinking is also associated with the frequency of drinking. For instance, more than two-thirds of the frequent drinkers could be considered "heavy drinkers" using the definition of heavy drinking as consuming five drinks or more at least once a month.

High proportions of drinkers reported experiencing alcohol-related problems in the past year but high quantity drinkers reported these problems more than low quantity drinkers. For example, Table 4 shows that heavy drinkers got into fights with others (42.1%), worried about the consequences of their drinking (72.2%) and tried to stop drinking entirely (71%) more than non-heavy drinkers (28.2%, 54.1% and 56.8% respectively).

Drinkers were asked to rate the importance attached to reasons often given for drinking. Table 5 shows the percent of high and low quantity monthly drinkers who rated each of the reasons as important. High quantity monthly drinkers endorsed the importance of all listed reasons more than low quantity monthly drinkers. For instance, approximately 47% of heavy drinkers (vs about 25% low quantity drinkers) reported drinking alcohol because it makes them feel happy or it is part of social life.

Table 6 shows the percentage of drinkers and non-drinkers who chose different reasons for not drinking more than at present or for being abstainers, respectively. Several items were of equal concern for both groups: drinking interfering with work, not wanting to become a drunkard, irresponsible behaviour trouble with the police, upset family and friends and feeling sorry after having done things while drinking are among those. More drinkers than non-drinkers endorsed the following statements: drinking costs too much makes people fat and makes people forget things.

When asked to indicate their level of approval or disapproval of drinking in certain situations by youth and adults, drinkers were more approving of drinking in all situations than non-drinkers. Table 7 shows that, in general, there was less approval of drinking by the young than by adults in both groups. Though drinkers were more approving of drinking in all situations, very low proportions of drinkers and non-drinkers supported heavy drinking by people in positions of responsibility (i.e., teachers and government officials). It is interesting that there were no clear differences in the percent approval of drinking by men and women in different situations.

Discussion

About 54% of Nigerians in this survey had taken some form of alcohol in the year preceding the interview. This relatively low prevalence was due to the high rate of abstention by Muslims. Among non-Muslims, more than 70% were drinkers. This reported high prevalence of drinking among non-Muslims in central Nigeria is also found in other parts of the country (International Council on Alcohol and Addictions, 1988).

In terms of frequency of drinking and quantity consumed, the most important finding of this survey is that drinking a substantial amount of alcohol during a drinking occasion seems to be the norm among drinkers in Nigeria. Heavy drinking, defined as the consumption of at least five drinks on one occasion once a month, was reported by 65% of drinkers. It was also the pattern of drinking irrespective of age, sex, income and residence. Among these drinkers, beer was the most popular beverage even though other types of alcoholic drinks were consumed. This is not surprising considering the widespread availability of beer in both rural and urban areas and, at the time of the study, its relatively cheap price.

What may help to account for the high levels of drinking is the unit of beer sold in the country. A typical Nigerian beer is sold in 60 cl bottle or as 2 units of alcohol and, because drinkers tend to regard this as "just one bottle", there is a tendency to drink high quantities at one sitting. Moreover, there is no control of drinking by the young and by adults in certain situations.

As would be expected, this situation has resulted in high prevalence of alcohol-related problems in the country. This study lends some support to earlier reports of problems associated with alcohol abuse, for example, mental illness (Obot & Olaniyi, 1991; Abioudun *et al.*, 1994) and violence (Obot & Obot, 1995). High quantity drinkers, in particular, reported high rates of social and psychological problems.

In spite of the importance placed on the publication of this study (Obot, 1993a), the study has some limitations that need to be mentioned. First of all, this report is limited to males because there were very few females in the overall sample of heads of household. This has, therefore, made it impossible to report the nature of drinking among women in Nigeria. A second limitation of the study is the inability to assess the per capita consumption of alcohol because of the unreliability of alcohol concentration in any other beverage except beer. Traditional beverages come in a variety of forms and alcohol concentrations and there is little consistency in serving measures. Moreover, alcohol concentrations in these drinks depend on the time between production and consumption. Serious effort needs to be applied in future surveys to determine the level of consumption of alcohol in different types of beverages.

In spite of these limitations, the Middlebelt study has been one of the most ambitious studies of alcohol use in Nigeria, not only because of its large sample size but because there was a serious attempt to make this sample representative of adults in the general population. There is urgent need for regular national monitoring of alcohol use and alcohol-related problems in Nigeria in order to provide the basis for alcohol policy in the country.

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Table 1

Frequency of drinking by selected socio-demographic characteristics (%)

CHARACTERISTICS	n	LIFETIME ABSTAINERS	LAST YEAR ABSTAINERS	LESS THAN ONCE A MONTH	1-3 TIMES A MONTH	ONCE OR TWICE A WEEK	3-4 TIMES A WEEK	5 OR MORE TIMES A WEEK
OVERALL	**1404**	41.6	4.2	1.6	3.6	5.7	7.0	36.3
AGE								
19 years or less	**64**	42.2	15.6	–	4.7	3.1	4.7	29.7
20-29 years	**502**	36.9	3.2	3.0	4.6	7.8	10.2	34.5
30-49 years	**708**	42.8	3.7	1.1	2.7	4.9	5.5	39.3
50+ years	**107**	60.7	6.5	–	1.9	1.9	3.7	25.2
EDUCATION								
None	**680**	48.2	5.7	0.6	2.5	4.1	4.6	34.3
1-8 years	**261**	35.2	3.4	1.9	5.0	7.3	8.8	38.3
9-13 years	**325**	37.5	2.8	3.1	4.6	8.0	7.4	36.6
14 + years	**138**	34.1	1.4	2.9	3.6	4.3	13.8	39.9
RELIGION								
Christian	**741**	27.0	2.7	2.7	4.6	8.0	8.2	46.8
Moslem	**573**	66.3	6.6	0.3	2.1	2.6	4.9	17.1
Other	**90**	10.0	1.1	1.1	4.4	5.6	8.9	68.9
RESIDENCE								
Rural	**857**	42.2	4.9	2.1	3.7	3.7	6.0	37.3
Urban	**547**	41.5	3.1	0.9	3.3	8.6	8.4	34.2
INCOME								
Low	**742**	41.4	4.7	1.8	3.0	5.4	7.1	36.7
Middle	**278**	48.2	4.3	1.1	3.6	3.6	6.5	32.7
High	**109**	43.1	1.8	1.8	4.6	6.4	2.8	39.4

NOTE: FOR SOME VARIABLES N MAY NOT EQUAL 1404 BECAUSE OF MISSING DATA.

Table 2

Prevalence of heavy drinking among drinkers by socio-demographic characteristics

CHARACTERISTICS	n	PERCENTAGE OF HEAVY DRINKING
OVERALL	756	64.9
AGE		
19 years or less	27	70.4
20-29 years	301	62.8
30-49 years	379	67.3
50+ years	35	54.3
EDUCATION		
None	313	58.8
1-8 years	160	66.9
9-13 years	194	69.1
14 + years	89	74.2
RELIGION		
Christian	521	66.4
Moslem	155	66.5
Other	80	52.5
RESIDENCE		
Rural	453	61.8
Urban	303	69.6
INCOME		
Low	132	77.3
Middle	43	62.8
High	17	88.2

NOTES: HEAVY DRINKING IS DEFINED AS THE CONSUMPTION OF FIVE DRINKS ON ONE OCCASION AT LEAST ONCE A MONTH.
NS MAY NOT EQUAL 756 BECAUSE OF MISSING DATA.

Table 3

Prevalence of heavy drinking by drinking frequency among current drinkers

FREQUENCY OF DRINKING	n	PERCENT HEAVY DRINKING
Less than monthly	**23**	0.0
1-3 times / month	**50**	44.0
1-2 times / week	**79**	59.5
3-4 times / week	**97**	72.2
5 times or more / week	**507**	69.4

Table 4

Percentage heavy and non-heavy drinkers with drinking-related problems in the past year (%)

DRINKING-RELATED PROBLEMS	NON-HEAVY DRINKERS (N=265)	HEAVY DRINKERS (N=491)
Felt you should cut down or stop drinking altogether	58.3	62.9
Gone without other things because of the cost of alcohol	32.1	45.9
Sometimes get drunk even when there is an important reason to stay sober	34.6	47.5
Have taken a drink first thing when you got up in the morning	42.6	47.5
Felt the effects of alcohol while at work	50.6	58.9
Have been in debt because of drinking	37.3	53.1
Got into a fight with others	28.2	42.1
Have been told to leave a place because of your drinking	24.4	26.9
Have been involved in road traffic accident	23.2	24.5
Got in trouble with authorities because of your drinking	20.4	26.5
Caused serious disruption in your family	20.5	27.9
Worried about your drinking or the long range consequences of your drinking	54.1	72.2
Tried to stop drinking entirely	56.8	71.0
NOTE: PERCENTAGES ARE BASED ON THE NUMBER OF VALID RESPONSES FOR EACH ITEM.		

Table 5

Percentage agreement with reasons for drinking by heavy and non-heavy drinkers

DRINKING-RELATED PROBLEMS	NON-HEAVY DRINKERS (N=265)	HEAVY DRINKERS (N=491)
Drinking makes me feel happy	25.7	46.6
Drinking is part of social life	24.3	47.3
I drink because most of my friends drink when we are together	12.7	27.1
Drinking makes me forget all my problems	22.5	34.1
I drink because I get drinks free	6.4	11.5
I drink when I feel frustrated	13.7	25.1
I drink because I have the money to spend	9.1	17.1
Drinking is the best way to celebrate	21.3	35.1
I drink when I feel bored	10.4	21.9
I drink when I feel tense or nervous	8.7	15.3
I drink because my parents drink or used to drink	10.6	11.7
I drink in order to quench thirst	8.5	18.4
I drink because I enjoy the taste of alcohol	13.8	24.3
I drink when I feel hungry	8.9	17.6
I drink when I have nothing else to do	14.0	16.9
I like the feeling of getting drunk	10.2	14.1
Note: Percentages are based on the number of valid responses for each item.		

Table 6

Percentage agreement with reasons for not drinking at all or for being careful about drinking among drinkers and non-drinkers

REASONS	NON-DRINKERS (n=648)	DRINKERS (n=756)
Drinking costs too much especially when you need money for other things	30.2	42.9
Drinking is bad for your health	39.5	33.5
Drinking may interfere with your work	37.2	38.0
My friends don't drink	18.1	12.4
Drinking can make you sick	30.1	25.7
I don't want to become a drunkard	32.4	34.0
I don't like the taste of alcohol	28.8	11.5
Drinking makes people commit crimes	31.6	25.7
Drinking makes people fat	14.0	16.8
Drinking makes people forget things	22.2	28.2
Drinking makes you behave irresponsibly	29.9	29.9
Drinking gets people into trouble with the police	25.8	25.4
Drinking is against my religious beliefs	41.8	39.6
My family and friends are upset when I drink	23.6	22.6
Drinking makes you do things you are sorry for later	29.2	29.2

NOTE: PERCENTAGES ARE BASED ON THE NUMBER OF VALID RESPONSES FOR EACH ITEM.

Table 7

Percentage approval of drinking situations involving male and female persons in the community by drinkers and non-drinkers

DRINKING NORMS	NON-DRINKERS (n=648)	DRINKERS (n=756)
A boy of 16 years or less drinks alcohol at a social function	9.0	31.2
A girl of 16 years or less drinks alcohol at a social function	8.6	23.4
A boy of 16 years drinks with friends in a bar	8.9	25.1
A girl of 16 years drinks with friends in a bar	8.6	20.3
A boy of 16 years drinks at home	12.9	35.7
A girl of 16 years drinks at home	11.3	31.1
A young man of 21 years drinks with friends	24.4	68.2
A young woman of 21 years drinks with friends	20.4	61.9
A man of 40 years drinks with friends	34.9	84.3
A woman of 40 drinks with friends	31.1	73.7
A woman of 40 years gets drunk occasionally	14.8	36.4
A man of 40 years gets drunk occasionally	16.4	47.0
A teacher or office workers gets drunk at work	5.9	14.7
A high government official drinks heavily	7.6	17.3

NOTE: PERCENTAGES ARE BASED ON THE NUMBER OF VALID RESPONSES FOR EACH ITEM.

Biography

Isidore S. Obot

He received his doctorate degree in psychology from Howard University, Washington, DC, and a master of public health degree from the Harvard School of Public Health, Boston, where he studied the relationship between behavior and health. He has taught psychology courses in Nigeria and the U.S. for many years and has been actively engaged in research and writing on alcohol, tobacco and other drug issues. Dr Obot is a recipient of several fellowships for work in the substance abuse field, including the National Institute on Drug Abuse / Hubert H. Humphrey Fellowship and the National Research Service Awards from the U.S. National Institutes of Health. He is currently the Executive Director, Centre for Research and Information on Substance Abuse (CRISA), Jos, Nigeria, and research fellow in drug dependence epidemiology and prevention at The Johns Hopkins University School of Hygiene and Public Health, Baltimore, USA.

Alcohol consumption patterns and association with the CAGE questionnaire and physiological variables in the Seychells Islands (Indian Ocean)

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Background

Drinking has been a long-standing public health problem in Seychelles. Previous reports based on sales data, which do not account for homebrew drinking, have shown high consumption of beer and spirits in Seychelles (Finnish Foundation for Alcohol Studies, 1977). High alcohol consumption in the country is consistent with a large proportion of the household budget being spent on purchasing alcoholic beverages [20% in the 1960s and 1970s (Benedict & Benedict, 1982) and 22% in 1983 and 1993 (Larue, 1996)] and high rates of alcohol-related admissions to hospital e.g., 33% of male admissions to medical wards, often for alcohol-related cardiomyopathy (Pinn & Bovet, 1991) and 38% of all admissions to psychiatric wards (Jeyakumar, In press). More generally, the population and the authorities are well aware of the large magnitude of the medical and social problems related to alcohol abuse. Several control and preventive programs have been taken by governmental and non-governmental organisations in this regard. However, while consumption based on sales data is readily available, little is known on homebrew drinking in the country as most of the production of these indigenous homemade drinks is unregistered and escapes control.

Two population-based health surveys were conducted in 1989 (Bovet *et al.*, 1991a) and in 1994 (Bovet et al., 1997). Both surveys were first aimed at assessing levels of cardiovascular risk factors in the population (Bovet *et al.*, 1991b) as cardiovascular disease has become the major cause of mortality in the country, accounting for more than 35% of all deaths over the last years. Because it is an important factor associated directly with dilated cardiomyopathy and indirectly with ischaemic heart disease, alcohol consumption was assessed in the two surveys. The self-reported nature of the data and the population-based design gave unique opportunities to assess homebrew consumption in the general population. In addition, the survey in 1994 examined the performance of the four-question CAGE questionnaire, an easy-to-perform screening tool to detect heavy drinking (Stockwell *et al.*, 1979; Ewing, 1984). Finally, the surveys gave opportunity to examine the relation between alcohol intakes and various biochemical and physiological variables in the general population, particularly with regards to serum lipids (Fontana et al., 1999).

The Seychelles

The Republic of Seychelles consists of 115 islands in the Indian Ocean, approximately 1800 kilometres east of Kenya and 1800 kilometres north of Mauritius. The climate is tropical with abundant rain and vegetation throughout the year. After having been administered by France until 1815, then by the United Kingdom, Seychelles gained political independence in 1976. According to a National census in 1994, the total population was 73,442 and 30.4% of the population was less than 15 years old, 49.3% less than 25 while only 5.6% was aged 65 or more. Thus the population aged 25-64 accounts for 45.1% of the total population. Around 89% of the total population live on the largest island, Mahé. Although intermarriage has blurred racial differences in many Seychellois, it is considered that approximately 65% of the population is of predominantly black African descent, 10% of predominantly Caucasian descent and 5% of predominantly Indian or Chinese descent, with the remaining 20% being mixed between these various groups. The standard of living has improved markedly in recent decades, which is concurrent with a dramatic increase in the tourism industry following the opening of the international airport in 1971. Gross domestic product (GDP) per capita increased from US$ 600 in 1976 to US$ 5,850 in 1994 and the World Bank considers Seychelles to be now a middle-income country.

Social background

The islands had no indigenous population until French colons and African slaves settled in 1770. These settlers were joined over the next decades by African indentured labourers released from slave ships and later, by small numbers of Indian and Chinese immigrants (Fauvel, 1909). The African population came from East and Central Africa and Madagascar, but they were unable to retain any tribal organisation after arriving in the Seychelles under conditions of slavery and indenture (Fauvel,

1909). Due to economic reliance on cash crops (e.g., vanilla, cinnamon and copra to some extent) rather than food crops, it has been claimed that the Seychelles society has not developed long-standing traditions and has relied much on the exchange of goods, particularly money, to regulate interpersonal relations (Benedict & Benedict, 1982). These authors claim that the different earning capacities between genders (men earning wages and women taking care of children and doing housework) provide important clues for understanding the contrasted behaviours, including drinking habits, between men and women. Beginning with culture traits derived from France by way of Mauritius and to a lesser extent from Africa and the East, and later from Britain, the Seychellois have developed their own way of doing things and they share the same language, customs, religion and values (Benedict, 1966). This homogeneity and distinctiveness about the culture of Seychelles contrasts, for example, with the plural society of the neighbouring Mauritius island where French, English, Indian and Chinese cultural traditions have been maintained by various sections of the population (Benedict, 1961). The Seychelles has experienced dramatic socio-economic development over the two last decades, which is likely to have accelerated acculturation phenomena. In this respect, Seychelles may now more resemble other rapidly developing small tropical island states than continental Africa to which Seychelles geographically belongs.

Alcohol beverages available in Seychelles

The common alcoholic beverages available in the Seychelles are commercially marketed beer, spirits and wines or indigenous homebrew produced at home or in (often unlicensed) semi-commercial plants. More than 90% of the beer consumed is produced locally (Lager, Guinness) while spirits and wines are imported. Of the homebrew, 'kalou' or palm toddy is made of fermented palm sap, 'baka' of fermented sugar-cane juice and 'lapire' of fermented juice of various vegetables (e.g., potatoes, lentils) or fruits. Baka and lapire tend to be considered together (consequently referred to as 'baka'). Commercial sugar is often added to boost their alcohol content and they have similar final alcohol content. Homebrew is usually consumed within days of the fermentation being completed. A survey conducted in 1996 by the Seychelles Breweries Ltd. indicated that there were 544 outlets (1 for 137 inhabitants; all licensed) selling beer, wines and spirits and 1055 outlets (1 for 71 inhabitants; 22 licensed) selling homebrew (communication by M. Racombo, sales and distribution manager, Seychelles Breweries Ltd.). Availability and price of homebrew do not materially vary over time or across regions of the country.

History of alcohol consumption

High alcohol consumption has been reported since the early history of Seychelles. In 1852, the Chief Civil Commissioner of Seychelles complained to the Colonial Secretary in Mauritius of the 'manufacture and consumption at almost every cottage of deleterious fermented drinks made from the sugar cane, pineapple and cocoa-nut' (Seychelles Archives B-31: 280). In 1903, the Governor wrote to the Secretary of State for the Colonies to report high numbers of police prosecutions for drunkenness. He believed that 'the great increase in drinking was due to the increasing amount of wages in circulation and higher wages being paid for all forms of indentured labour' and that 'more education was needed' (Seychelles Archives C/AM/8). Based on the number of licensed palm trees producing toddy, locally-produced beer and imported other drinks (but not counting baka and other homebrew), men over the age of 15 were reported to drink 3 litres of alcoholic beverages per day in 1972 (Benedict & Benedict, 1982). Another estimate in 1972 based on the consumption of wine spirits and beer (thus not counting homebrew) showed per capita consumption in Seychelles slightly smaller than that in France and Germany but higher than in Britain and much higher than in Barbados (Finnish Foundation for Alcohol Studies, 1977). Independence has not diminished government concern about drinking. Soon after independence, a leading article in the government paper proclaimed, for example, that 'the scourge of alcoholism must be fought by every means' (*Nation*, 1st October 1977, p2). Substantial efforts have been made over the last 20 years to curb drinking. These include the establishment of a national task force on alcohol

abuse, the broadcast of many educational and prevention programs on the mass media and, more recently, an Alcoholics Anonymous group, a telephone hot line for those affected by alcohol abuse and a day-care rehabilitation centre for alcoholics.

Traditional alcohol consumption patterns

Male labourers traditionally often stop by the yard of a seller of toddy or baka, purchase a bottle, drain it and go their way. Men can also meet with neighbours or work mates near a shop, at a homebrew seller's, on the beach or on the road and have a few beers or some homebrew while chatting or playing dominoes. Men traditionally do not often bring alcohol beverages (particularly homebrew) to their own houses, as this is apt to engender disputes with their wives, much on the basis that alcohol consumption drains money from the household budget. However, alcoholic beverages are also consumed in large amounts, particularly by men, at parties held at home to celebrate important family events (e.g., first communions, confirmations, Christmas, New Year) or in community based social events (e.g., fancy fairs for the patron saint of a village or a church).

Subjects and methods

The Seychelles Heart Study II (1994)

Study sample

The Seychelles Heart Study II was conducted from July to December 1994. Detailed methods have been described elsewhere (Bovet *et al.*, 1997) (full text available on http://www.seychelles.net/smdj). Sampling was done using a simple age- and sex-stratified random sample of all residents aged 25-64 years living on the island of. Using computed data from National census carried out in 1987 which were thereafter regularly updated by the administrative authorities, 160 subjects were selected randomly within each of the eight sex- and 10-year strata. Among the initial sample of 1280 eligible subjects, respectively 28 men and 26 women were dead or abroad at the time the study was carried out and were consequently excluded so that 1226 subjects were eligible to participate in the study. Overall, 1067 out of the eligible 1226 individuals attended the study, for a response rate of 87% (82.4% of men and 91.7% of women). Letters to invite participants to the study could not be delivered by the postal services and were returned unopened to the study centre for 38 out of the 159 eligible persons (24%) who did not participate in the study.

Questionnaire and physical examination

All participants were administered a questionnaire in the local Creole language by three experienced Seychelles health nurses in a face-to-face interview lasting approximately 30 minutes. The questionnaire included 207 questions pertaining to socio-demographic context, educational level, occupation, cardiovascular risk factors and dietary habits, as well as knowledge and attitudes on health and lifestyles including alcohol drinking. A description of the current or last job was requested and occupation was categorised at the time of the interview. Weight and height were measured and body mass index (BMI) was calculated as body weight (kg) divided by height squared (m2). Blood pressure was determined on the basis of the average of the last two of three readings, taken with a mercury sphygmomanometer after subjects had sat in a quiet environment for at least 30 minutes. Participants were also submitted to an electrocardiogram, an ultrasonography of the femoral and cervical arteries and an echocardiography.

Alcohol consumption

Questions on alcohol drinking followed the questions on dietary habits. To filter regular drinkers, all participants were first asked a frequency question: 'How frequently, on average, do you usually drink any alcoholic beverage?' referred to hereafter as 'a drink'. Possible answers were:

- Never
- Only on some occasions but less than once a week on average
- Once or twice a week on average
- Every other day on average
- Almost every day or every day.

Persons reporting to have a drink less often than '*Once or twice a week*' but not '*Never*' were categorised as occasional drinkers and were not asked further questions about their detailed alcohol consumption. Persons reporting to have a drink at least as often as '*Once or twice a week on average*' were considered as regular drinkers. These were further systematically questioned using five separate semi-quantitative food frequency questions, about their weekly average consumption of bottles of beer, kalou, baka or lapire, glasses of wine and measures of spirits (e.g., 'On average, how many bottles of beer do you drink in a week, including the week-end?').

CAGE questionnaire

The four-question CAGE questionnaire was submitted to the subset of regular drinkers. The questions are the following: Have you ever felt you ought to cut down on your drinking? Have people annoyed you by criticising your drinking? Have you ever felt bad or guilty about your drinking? Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover (Eye-opener)? (Stockwell et al., 1979; Ewing, 1984). These questions were translated into Creole as

follows: *Ou'n deza santi ki ou dwatet diminyen kantite ki ou bwar? Eski dimoun i'n deza annwiy ou an dizan ou bwar tro bokou? Eski ou'n deza santi anbarase akoz ou bwar? Eski ou'n deza bwar premyen keksoz bomaten?* The CAGE questions were asked without implying a time referent, thus possibly reflecting the life-long experience of respondents.

Blood lipids and other variables

Serum was obtained within an hour of blood collection and immediately frozen at -20° Celsius and lipid analyses were performed less than 1 year after blood drawing. Lipid analyses were performed at the Lipid Laboratory, University Medical Policlinic, Lausanne, Switzerland with the exception of lipoprotein (a) which was determined at the Canton Institute of Haematology and Clinical Chemistry, St-Gallen, Switzerland and thiamine which was analysed at Pasteur Institute in Lyon, France. Methods used to measure total cholesterol, high-density lipoprotein (HDL) cholesterol, particles Lp AI, particles Lp AI:II; triglyceride, apoproteins apo A1 and apo B, lipoprotein(a), sex hormone binding globulin (SHBG), free testosterone, estradiol, growth hormone, albumin, thiamine and carbohydrate-deficient transferrin (CDT) have been described elsewhere (Bovet *et al.*, 1997; Fontana *et al.*, 1999).

The Seychelles Heart Study I (1989)

Study sample

The Seychelles Heart Study I was conducted from April to September 1989. Detailed methods have been described elsewhere (Bovet *et al.*, 1991a). The sampling was done using a simple age- and sex-stratified random sample of all residents aged 25-64 years living on the island of Mahé. Using computed data from a national census carried out in 1987, which were thereafter regularly updated by the administrative authorities, 130 to 171 subjects were selected randomly within each of the eight sex- and 10-year strata. Among the initial sample of 1251 eligible subjects (652 men, 657 women), 37 men and 21 women were dead or abroad at the time the study was carried out and were consequently excluded so that 1251 subjects were eligible to participate in the study. Overall, 1081 (513 men and 568 women) attended the survey, for a response rate of 86% (83.4% for males and 89.3% for females). Letters to invite participants to the study could not be delivered by the postal services and were returned unopened to the study centre for 52.9% of the 170 eligible persons who did not attend the survey.

Questionnaire, physical examination and blood collection

All participants were administered a questionnaire in the local Creole language by three experienced Seychelles health nurses in a face-to-face interview lasting approximately 25 minutes. The questionnaire included 130 questions pertaining to socio-demographic context, educational level, occupation, cardiovascular risk factors and dietary habits. All participants also underwent a short physical examination and a blood collection.

Alcohol consumption

Questions on alcohol consumption followed those on dietary habits. All participants were systematically asked 12 semi-quantitative food frequency questions to assess their average consumption for all six available alcoholic beverages (beer, spirit, wine, kalou, baka and lapire) both from Mondays to Thursdays and from Fridays to Sundays. For beer for example, all participants were asked 'On average, how many bottles of beer do you drink from Mondays to Thursdays?' and, in a separate question, 'On average, how many bottles of beer do you drink from Fridays to Sundays?'. The same questions were asked for bottles of baka, kalou and lapire, and for glasses of wine and pegs of spirits.

Differences in the two population-based surveys

Alcohol consumption was assessed slightly differently in the 1994 and 1989 surveys. In 1994, respondents were first asked a question on their overall drinking frequency patterns and only participants reporting weekly consumption had their

consumption further quantified (thus, drinking volume by 'occasional' drinkers was not quantified). In 1989, participants were not questioned on their overall drinking frequency patterns but were all systematically submitted to several questions assessing their drinking frequency and volume for each of the beverages available in Seychelles. Assessment of alcohol consumption in the 1994 survey also differed from that of the 1989 survey in the following ways: 1) In 1989 consumption of baka and lapire was assessed in two different questions while in 1994 baka and lapire were considered together in one question; 2) Two questions for each beverage were used in 1989 to distinguish between consumption during workdays and week-ends, while one question was used in 1994 to assess the weekly consumption for each beverage. In both surveys, no more than five persons did not provide answers to any of the questions pertaining to the variables under consideration in this report. Missing data from blood analyses result from shortage of serum. Because of these methodological differences, direct comparisons of consumption figures in 1989 and 1994 will not be drawn and most results presented in this report arise from the 1994 survey. Data from the 1989 survey were used only to estimate the per capita consumption and prevalence and volume of specific alcohol beverages. However, per capita consumption, prevalence and volume of specific alcohol beverages in 1994 were published separately (Perdrix J *et al.*, 1999).

Measurements

Measures of alcohol consumption

For both surveys, average daily intake of ethanol in regular drinkers was calculated from the frequency of weekly units of alcoholic beverages (i.e. bottles of beer, kalou and baka, glasses of wine and pegs of spirits) and ethanol content for each type of beverage (thus a multiplicative function of a frequency and a volume measures). Questions on drinking frequency referred to a 'normal week' without specified time period referent. Noticeably, beer, spirit, wine, kalou and baka are generally available in Seychelles in only one type of bottle for each beverage. The following values were used for volume of beverage and alcohol content:

- Beer: 0.3 litre bottle, 5.45 volume %
- Spirits: 0.05 litre measure, 43 volume %
- Wine: 0.2 litre glass, 12 volume %
- Kalou: 0.75 litre bottle, 8 volume %
- Baka and lapire: 0.75 litre bottle, 9 volume %

The alcohol content of beer was weighted for the contribution of 'Guinness' and 'Lager', which amount respectively to about 20% and 80% of sales and contain 7.5 volume % and 4.9 volume % alcohol respectively. The alcohol content of homebrew was determined from eight samples of each of the three local brews, which were collected in 1996 at several semi-commercial plants throughout the country. Alcohol content of homebrew was determined at the Laboratory of Analytic Toxicology, Institute of Legal Medicine, University of Lausanne in Switzerland, less than two weeks after they were purchased. Analysis was performed using gas chromatography with flame ionisation detection, introduction by head-space and direct injection, and separation on either Carbowax 20 (partition chromatography) or Chromosorb 102 (adsorption chromatography). No significant amount of methanol or formaldehyde was detected. Previous analyses conducted in 1989 in a UK laboratory on fewer samples showed similar alcohol contents (Pinn & Bovet, 1991). Categories of drinking frequency appearing in the tables correspond to the original categories of the questionnaire. Drinking volume categories were arbitrarily defined (e.g., 1-60 ml/day, 61-150 ml/day, and more than 150 ml/day).

Per capita consumption

The reported per capita alcohol consumption of the population aged 25-64 was adjusted for the actual distribution of the population in 1989. Extrapolation to the population aged more than 14 and to the total population was also performed to permit some comparison of figures in Seychelles with figures from other countries (sales data often use the population aged more than 14 or the general population as the denominator). The following assumptions were made for these extrapolations,

which are believed to be conservative in the context of Seychelles (thus, the resulting per capita estimates would be likely to indicate lower limits of the true figures). Consumption by persons aged 15-24 was assumed to be half that of persons aged 25-34. Noticeably, consumption by adolescents aged 15 to 17 years is likely to be low as more than 95% of adolescents of that age attended, at the time of the surveys, a 2-year boarding school (National Health Service) where alcohol was unavailable and relevant control enforced strictly. Consumption by persons aged less than 15 was assumed to be null. Consumption by persons aged less than 15 is indeed likely to be unsubstantial as drinking by children is socially not tolerated in Seychelles. Consumption by persons above 64 years was assumed, probably conservatively, to be equal to half of that of the age-adjusted consumption in the population aged 25-64. In order to permit direct comparison with international data, estimates were also adjusted to the European Standard Population (United Nations, 1991) as the population from Seychelles is much younger than that from Western countries. For overall consumption per capita, gender was weighted by assuming that males and females accounted each for 50% of the population.

Validity of reported consumption estimates

The validity of the surveys estimates was assessed by comparing, for beer, self-reported consumption extrapolated to the entire population to sales data in 1989 and in 1994. Sales of imported and locally produced beer are available from the Statistics Division of the Seychelles government. Sales to tourists were deducted on the assumption that each tourist drinks one bottle of beer per day of stay (overall approximately 10% of the total sales).

Statistical tests

The Chi-square test was used to test for differences between categorical variables. Cuzik's nonparametric test, an extension of the Wilcoxon rank-sum test, was performed to test for trends of continuous variables across ordered groups. Non-parametric Spearman correlation coefficients were used to test the association between categorical variables. Multiple regression was carried out to examine the effect of alcohol on selected continuous variables, after adjustment for age, body mass index and smoking status.

Results

Table 1 shows the prevalence and daily volume of drinking by gender, age and beverage type in Seychelles in 1989. Across all ages, 75% of men and 29% of women drink alcohol, for a total prevalence of drinking of 50%. Prevalence of drinking does not seem to vary according to age among men. Overall, 67% of men drank beer, 26% spirits, 6% wine, 26% kalou and 28% baka. Daily volume per drinker was substantially higher in the 40-64 than 25-39 years of age groups in both men and women. With respect to alcohol derived from various beverages, drinkers of beer had 33 ml ethanol per day, drinkers of spirit had 26 ml, drinkers of wine 45 ml, drinkers of kalou 61 ml and drinkers of baka 73 ml. The amount of ethanol derived from homebrew was approximately twice as large as the amount of ethanol which drinkers drinking only commercial beverages had from commercial beverages (99 ml compared to 48 ml). Persons aged less than 30 drank less often homebrew, baka and kalou than older persons.

Data not displayed in the Table indicated that few homebrew drinkers did not consume commercial beverages as well (36 out of 249 [15%] in 1989). Drinkers of homebrew in the study sample had similar daily alcohol intake from commercial beverages than drinkers who did not drink homebrew (respectively 51.3 ml *vs.* 48.2 ml per day in 1994; p=0.8) and this amount of alcohol derived from commercial beverages was not different (respectively 51.7 ml *vs.* 51.0 ml in 1994; p=0.9) in drinkers who had high (>100 ml/day) or moderate (1-100 ml/day) amount of homebrew.

Due to small numbers of female drinkers, only broad categories ('commercial beverages' and' homebrew') have been analysed for women. Smaller proportions of women drank homebrew but homebrew drinkers had higher alcohol amounts derived from homebrew. Higher proportions of women drank commercial beverages but had lower alcohol derived from these commercial beverages. Proportions of female drinkers tended to be lower in the 25-29 years category compared to the older age categories, particularly for homebrew.

Table 2 shows per capita alcohol consumption estimates in the population aged 25-64 and estimates extrapolated to the population aged more than 14 and to the general population. Moderate difference (often approximately 10%) was noticed when comparing age-adjusted estimates to unadjusted estimates for the population aged more than 14. For estimates in the entire population, unadjusted estimates were lower than adjusted estimates by up to 20-40%, consistent with the much younger population in Seychelles than in Europe. Based on the consumption in men aged 25-64, results indicate that more than half of the total alcohol intake was accounted by homebrew (55% [15.7% / 26.4%] in 1989) and that beer accounted for 66% [8.3% / 12.6%] of the total alcohol intake derived from commercial beverages. Self-reported consumption of beer extrapolated to the entire population corresponded to 62% of sales in 1989.

Table 3 shows the association of drinking frequency with age and education among the participants of the 1994 survey. The small number of regular female drinkers precludes meaningful observation. In men, age did not relate strongly with the proportion of abstainers but older persons drank more often daily than young persons. The Spearman correlation coefficient between drinking frequency and age categories was weak and not statistically significant (r = 0.064, p= 0.157). Education was not associated with the proportion of abstainers but persons with lower education were more numerous to drink daily than persons with higher education (Spearman correlation coefficient between drinking frequency categories and education categories = -0.141, p =0.005).

Table 4 shows the association of average daily drinking volume with age and education among participants of the 1994 survey. In this analysis, occasional drinkers (<1 drink per week) have been included in the 1-60 ml/day alcohol intake category. The small number of regular female drinkers precludes meaningful observation. For men, older persons drank higher volume than young persons (Spearman = 0.106; p=0.027). Persons with little education drank higher volume that persons with higher education (Spearman = -0.290; p=0.000).

Table 5 shows that drinking frequency correlated strongly with volume of drinking in both genders (Spearman coefficient between these categories = 0.685, p=0.000 for men and 0.584; p=0.000 for women).

Table 6 shows the response to the CAGE questionnaire by drinking frequency. Analyses related to the CAGE questionnaire are limited to regular drinkers and therefore do not include abstainers and occasional drinkers. The proportion of positive answers increased over drinking frequency categories for each separate CAGE question but the range of increase was modest for all questions (less than 25% range). The proportion of subjects with two or more positive answers to the CAGE also increased with drinking frequency, ranging from 53% to 74%.

Table 7 shows the response to the CAGE questionnaire by volume of drinking. The largest increase in the range of response was observed for the 'Eye-opener' question that increased from 23% to 65% across the three considered categories of drinking. A CAGE score of at least two positive items had fairly high sensitivity since it detected approximately 90% of drinkers in the highest volume category. However the specificity was low with approximately 50% of the drinkers in the lowest volume category also answering positively to at least two CAGE items.

Table 8 shows the univariate association between drinking volume and several blood lipids, thiamine, CDT, hormones, blood pressure, body mass index and smoking habits in men aged 25-64. Dose-dependent relationships with alcohol were found for all serum lipids examined except for triglycerides. For example, HDL-cholesterol increased by 38% from the lowest to the highest drinking volume. Blood pressure and smoking were also strongly associated with alcohol intake but body mass index was not. Thiamine was significantly lower in the highest drinking volume category compared to other drinking categories. Sex hormone binding globulin and free testosterone were associated with alcohol but not estradiol and growth hormone. Expectedly, carbohydrate deficient transferin was strongly associated with alcohol.

Table 9 shows the regression coefficients of alcohol volume on selected variables in men aged 25-64, after adjustment for age, body mass index and smoking status. Such coefficients can be interpreted, for example, as follows: for HDL-cholesterol, consumption of >150 ml/d of alcohol is associated with an increase of 0.45 mmol/l compared to non-drinkers, independently of age, body mass index and smoking status. Dose-dependent independent relationships were found for blood pressure, LDL-cholesterol, HDL-cholesterol, apo A, LpAI:AII, and CDT. A non-dose dependent decrease was found for SHBG and free testosterone. Heaviest drinkers tended to have low thiamine levels (the small number precludes statistically powerful analysis).

Discussion

Using the same 25-64 age groups and similar methods, self-reported annual alcohol consumption was 26.4 litres per man and 3.2 litres per woman in Seychelles in 1989, compared to 9.4 litres per man and 3.3 litres per woman in Switzerland (Schmid & Gmel, 1996). Per capita estimates in Seychelles in 1994, not accounting for drinking by occasional drinkers, were consistent with 1989 findings with 20.7 litres per man and 1.2 litres per woman aged 25-64 years (Perdrix *et al.*, 1999), Considering that Switzerland has among the highest alcohol sales per capita in Western countries, this may indicate a high or very high alcohol consumption in Seychelles. The self-reported beer consumption corresponded to respectively 52% and 62% of the actual sales in 1994 and in 1989. With this approximately 50% underestimate in mind, the reported consumption per capita of total population in Seychelles (10.3 l in 1989, after adjustment to the European population) seems high compared to per capita sales in selected other countries, e.g., 11.4 litres in France, 9.7 litres in Switzerland, 7.5 litres in the United Kingdom, 3.8 litres in Cuba, or 1.6 litres in Singapore (World Drink Trends, 1995). As mentioned in the introduction, high consumption of alcohol in Seychelles is supported by the findings that alcohol accounted for a large proportion of the household budget of a labouring family (Benedict & Benedict, 1982; Larue, 1996) and a high frequency of hospital admissions related to alcohol (Pinn & Bovet, 1991; Jeyakumar, In press). Interestingly, very high alcohol consumption was also reported in Guadeloupe (Moutet *et al.*, 1989), a Caribbean island sharing with Seychelles a tropical climate and a Creole culture. In contrast, alcohol consumption seemed lower in the neighbouring Mauritius island with 17.6% of men and 0.7% of women reporting drinking at least 3 standard drinks per day (Pereira, 1998), which may relate to the Indian cultural background shared by large segments of the Mauritius population.

It is noticeable that more than half of the total alcohol intake in the population of Seychelles was derived from homebrew (55% in 1989). Although homebrew was consumed only by a minority of the population (38% of men; a few percents of women), mostly of low socio-economic status, homebrew drinkers had particularly high alcohol amount derived from these home made beverages. Noticeably, toddy drinking volume decreased while that of baka increased in 1994 compared to 1989, which suggests a shift in consumption patterns from toddy to baka. This is consistent with a recent obvious decrease in the availability of palm sap toddy, possibly partly because toddy production requires that somebody climbs up to the top of palm trees to collect the palm sap every day, while baka can be produced more easily. The much lower cost per alcohol unit of homebrew, compared to beer or spirits (currently a 1:6 ratio), is however likely to be an important factor to further maintain homebrew drinking in segments of the population.

Standardised questionnaires for investigating weekly consumption, as that used in this study have been shown to be reliable instruments for measuring alcohol intake (Babor, Stephens & Marlatt, 1987). For example, a food-frequency questionnaire has been shown to measure alcohol-intake by regular drinkers as reliably and validly as a reference method consisting of repeated 7-day dietary records (Ferraroni *et al.*, 1996). In addition, our study showed a dose-dependent relation of reported alcohol intake with classical indicators of alcohol consumption, such as CDT or HDL-cholesterol. However, the self-reported consumption of beer estimated from the 1989 survey, extrapolated to the entire population, amounted to 62% of annual sales in these same years, respectively. The magnitude of underestimation between self-reported and sales data in Seychelles does however compare with that found in other surveys assessing self-reported consumption, which typically ranged from 40% to 60% (Midanik, 1982; Pernanen, 1974; Gmel, 1996). Causes for underreporting alcohol consumption in surveys assessing self-reported data are numerous. First, the design of the survey in 1994 did not permit to quantify drinking by occasional drinkers. This is the main reason why data from the 1989 survey were used to estimate prevalence of drinking in the Seychelles. Second, surveys based on self-reporting cannot account for drinking denial whereby drinking quantity and frequency are often under-estimated. Third, regular drinkers often deny or overlook binge drinking and its extent is underestimated by questions on average weekly consumption. This may be relevant to Seychelles data as many people drink mostly during the end-of-the-month period. Fourth, social

desirability is likely to occur whereby subjects interviewed by health professionals tend to underreport the amount they consume. This may have occurred in 1994 more than in 1989 in view of the launching of several alcohol awareness campaigns in the mass media in the interval. It is conceivable that such causes of underestimation may apply more to women than men in this study considering the larger social tolerance for men's than women's drinking in Seychelles. Overall, it is likely that the data correctly rank the distribution of alcohol consumption but underestimate the true alcohol consumption, possibly by half.

Drinking, mainly by men, is not a recent problem in Seychelles and various underlying factors can be mentioned. Alcohol is widely available throughout the country and homebrew can be purchased at low price at any time of the year. Benedict & Benedict (1982) emphasised that alcohol drinking is an important aspect of the male role in Seychelles. These authors emphasise that, while drinking is an integrated part of men's recreational activities and social network, women who drink have been exceptions and are generally regarded as playing an inappropriate male role or considered a kind of social failure, condemned by men and women. In their investigations of the Seychelles society of the 1970s and early 1980s, Benedict and Benedict (1982) also describe how monetary and social demands from wives, mistresses, children, parents and friends press upon older men (particularly those likely to earn lower income as they get older e.g., labourers) and how men can be caught in a system of expectations and demands over which they have little control. Drinking also results from considerable peer pressure. Though adolescents receive some introduction to drinking at home, the habit becomes ingrained in the company of their peers and drinking is part of the camaraderie that helps bring young males peer groups together. For example, males who fish together usually drink together after they have sold their catch.

The relation between socio-economic status and alcohol consumption was found to depend on which type of beverage is considered. The much higher alcohol consumption by persons of low socio-economic status could be entirely attributed to homebrew drinking which is a habit found in 51% of labourers but in only 1% of white-collar workers. However, the frequency and volume of drinking of commercial alcoholic beverages was at least as high in persons with white-collar as in those with blue-collar occupations. Noticeably, homebrew drinkers also drank commercial beverages in amounts similar to drinkers of commercial beverages who did not drink homebrew.

It may be anticipated that a future reduction in homebrew drinking will be an important factor to lower the overall per capita consumption. However, factors favouring an increase in alcohol consumption include the fact that increasing socio-economic development enables more persons to buy commercial alcoholic beverages. Similarly, Seychelles women, who had traditionally little economic purchasing power and very low alcohol consumption, are likely to increase their alcohol consumption as many of them become economically active. When anticipating further trends in alcohol consumption, the role of alcohol in the Seychelles society should be taken into account. If drinking has often served as a means for Seychelles men to evade responsibility vis-à-vis their significant others or reflects limited opportunities for upward social mobility (Benedict & Benedict, 1982), rapid socio-economic development and subsequently rising expectations are also likely to impose increased pressure with drinking as a possible response, including homebrew in segments of the population with low purchasing power.

In Western countries, the CAGE questionnaire, which is widely used for alcohol-abuse screening in hospital and outpatient settings has been shown to have a sensitivity of 0.76 to 0.85 and a specificity of 0.95 to 0.97 for a cut-off score of two positive questions (Bush *et al.*, 1987; King, 1986). In Seychelles, the CAGE showed good sensitivity but low specificity (admittedly that the CAGE was not tested in abstainers or occasional drinkers in this study). The positive predictive value (the probability that someone who tests positive is a heavy drinker) would be consequently low, despite a high prevalence of heavy drinkers, which undermines the usefulness of the CAGE as a screening instrument in this population. The question on 'guilt' was not a very good discriminator (increasing only from 40.2% to 66.1% from lowest to highest drinking volume category) that is consistent with large social

acceptability of male drinking in the local culture. Such culture dependency of the CAGE questions has also been demonstrated in Malaysia, where Muslim Malays scored high on the question 'Guilty' in contrast to Chinese and Tamils for whom alcohol is not taboo (Indran, 1995). On the other hand, the question 'Annoyed' scored consistently higher (increase from 37.4% to 83.9%), which may relate to the locally wide recognition that drinking does cause social problems. The 'Eye-opener' question appeared the most discriminative question in this population (increase from 23.4% to 69.4%), possibly because this question is less sensitive to socio-cultural influences. These findings suggest that screening questionnaires such as the Alcohol Use Disorder Identification Test (AUDIT), a short multicultural screening tool for the early detection of problem drinking (Babor & Grant, 1989) and the Severity of Alcohol Dependence Questionnaire (SADQ) (Stockwell et al., 1979), which rely on symptoms of physical and psychological addiction more than issues related to the socio-cultural context, could have better performance in a cross-cultural setting.

Not unexpectedly, alcohol intake was associated with several classical indicators in a dose-dependent manner, such as CDT, which is a reliable biological marker of alcohol consumption in clinical settings (Yersin et *al.*, 1995; Kapur *et al.*, 1989; Stibler, 1991) and HDL-cholesterol (Hulley & Gordon, 1981; Hartung *et al.*, 1990). It was found that one-half of the reduction of coronary risk related to alcohol consumption was mediated through its effect on HDL-cholesterol (Criqui, 1994). Two types of HDL particles can be distinguished: Lp AI:AII particles (containing apo A-I and apo A-II) and Lp A-I particles (which contain apo A-I but not apo A-II). Because apo A-II is an antagonist of cholesterol efflux, Lp A-I but not Lp A-I:A-II mediates the translocation of cholesterol from its intracellular pools toward the cell membrane, thus the former but not the latter may have anti-atherogenic properties (Fruchart & Ailhaud, 1993). The lower increase in Lp A-I than Lp AI:AII associated with alcohol consumption in our data, which was also found in other studies (Puchois *et al.*, 1990), may suggest only limited benefit from a coronary risk point of view. The apparently favourable inverse relationship between alcohol and lipoprotein (a), an independent risk factor for coronary heart disease, is consistent with other studies (Huang et *al.*, 1992; Paassilta M *et al.*, 1998). In a separate study, we show that this relation is not related to the size of the apo(a) gene isoforms, the synthetic function of the liver and the sex hormone biochemical status (Fontana *et al.*, 1999). LDL-cholesterol, a strong risk factor for coronary heart disease, related inversely with alcohol consumption, irrespective of age and weight. Expectedly, the prevalence of smoking was much higher in drinkers than abstainers. Blood pressure increased substantially with alcohol intake, as repeatedly demonstrated in epidemiological studies (Wallace *et al.,* 1981; Beilin & Puddey, 1992; Klag *et al.*, 1993). Consistent with a large body of evidence (Tallaksen & Bohmer, 1992), high alcohol consumption was associated with low levels of blood thiamine (Bovet *et al.,* 1998), which put heavy drinkers at increased risk for dilated cardiomyopathy and polyneuropathy. Thus, the unfavourable changes in smoking prevalence, blood pressure and blood thiamine levels associated with alcohol consumption oppose the possibly apparently beneficial effects of alcohol on lipid levels.

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Conflict of interest

None.

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Table 1

Prevalence (%) and daily volume (ml) of drinking by gender, age and beverage type, SHS 1989

	AGE (YEARS)				
	25-29	30-39	40-49	50-64	TOTAL
MEN (n)	**54**	**121**	**140**	**198**	**513**
ALL DRINKS					
Percent drinkers	74.1	75.2	77.1	73.7	74.9
Daily amount per drinker	81.9	85.7	121.8	113.3	96.5
ALL COMMERCIAL DRINKS					
Percent drinkers	72.2	72.7	72.9	66.1	71.2
Daily amount per drinker	38.4	65.0	38.4	41.3	48.4
ALL HOMEBREW					
Percent drinkers	33.0	17.3	66.0	56.3	37.9
Daily amount per drinker	89.0	67.4	142.3	128.0	98.5
BEER					
Percent drinkers	66.7	71.9	66.4	60.1	67.1
Daily amount per drinker	30.4	43.9	25.6	25.4	33.3
SPIRITS					
Percent drinkers	31.5	24.8	21.4	22.3	25.5
Daily amount per drinker	21.3	35.8	45.6	40.1	34.4
WINE					
Percent drinkers	5.6	7.4	5.7	6.0	6.3
Daily amount per drinker	19.7	91.2	20.6	17.8	44.7
KALOU					
Percent drinkers	29.6	19.0	30.0	28.8	25.8
Daily amount per drinker	51.5	45.4	86.1	78.7	60.9
BAKA					
Percent drinkers	29.6	15.7	37.1	36.9	27.5
Daily amount per drinker	59.7	55.1	108.3	91.1	72.8
WOMEN (n)	**72**	**134**	**137**	**225**	**568**
ALL DRINKS					
Percent drinkers	30.6	29.1	23.4	30.2	28.8
Daily amount per drinker	19.4	21.5	58.4	37.3	31.4
ALL COMMERCIAL DRINKS					
Percent drinkers	30.6	27.6	21.9	27.1	27.3
Daily amount per drinker	17.6	13.7	35.7	17.2	19.5
ALL HOMEBREW					
Percent drinkers	4.2	4.5	8.0	11.2	6.8
Daily amount per drinker	13.0	55.2	72.5	57.0	46.9

Table 2

Per capita alcohol consumption (litres per year), by gender, age, and beverage type, SHS 1989

	AGE (YEARS)				
	25-64	15 AND MORE	15 AND MORE (ESP*)	ALL	ALL(ESP*)
MEN (n)	12 820	21 515	–	33 490	–
All drinks	26.4	20.5	23.7	13.2	18.3
All commercial drinks	12.6	9.6	10.1	6.1	7.8
All homebrew	15.7	12.1	16.2	7.7	12.6
Beer	8.3	6.4	6.5	4.1	5.0
Spirits	3.1	2.4	2.7	1.5	2.1
Wine	1.1	0.8	0.7	0.5	0.6
Kalou	5.9	4.8	5.7	3.1	4.4
Baka	7.9	6.2	7.9	4.0	6.1
WOMEN (n)	12 082	19 215	–	30 776	–
All drinks	3.2	2.4	2.8	1.5	2.3
All commercial drinks	1.9	1.5	1.6	1.0	1.3
All home brews	1.3	0.8	1.2	0.5	1.0

ESTIMATES IN THE CATEGORIES 25-64, 15 AND MORE AND ALL ARE ADJUSTED FOR AGE, ASSUMING THAT CONSUMPTION FOR PERSONS AGED 0-14 IS NULL, CONSUMPTION FOR PERSONS AGED 15-24 IS HALF THAT OF PERSONS AGED 25-29 AND CONSUMPTION FOR PERSONS AGED MORE THAN 64 IS HALF THAT OF PERSONS AGED 50-64.

ESP : ADJUSTED TO EUROPEAN STANDARD POPULATION (UNITED NATIONS WORLD POPULATION PROSPECTS, 1990, NEW YORK, UNITED NATIONS, 1991).

Table 3

Drinking frequency (%) by gender, age and education, SHS 1994

	MEN						WOMEN					
	n	ABSTAINERS	<1/WEEK	1-2/WEEK	3-4/WEEK	DAILY	n	ABSTAINERS	<1/WEEK	1-2/WEEK	3-4/WEEK	DAILY
AGE (YEARS)												
25-29	**59**	10.2	52.5	18.6	11.9	6.8	**67**	43.3	50.7	1.5	3.0	1.5
30-39	**127**	11.8	34.6	12.6	11.8	29.1	**141**	48.2	44.7	0.7	2.1	4.3
40-49	**131**	16.8	29.8	6.1	11.5	35.9	**139**	45.3	51.1	0.0	0.7	2.9
50-64	**187**	17.1	31.0	7.5	10.2	34.2	**216**	45.4	48.1	1.4	0.5	4.6
EDUCATION (YEARS)												
0	**35**	17.1	20.0	8.6	8.6	45.7	**30**	33.3	53.3	3.3	3.3	6.7
1-6	**223**	15.7	29.1	7.6	13.0	34.5	**250**	47.6	46.8	1.2	0.8	3.6
7-9	**136**	13.2	35.3	8.1	9.6	33.8	**200**	45.0	49.0	0.5	2.0	3.5
10-12	**84**	14.3	48.8	16.7	7.1	13.1	**74**	50.0	47.3	0.0	0.0	2.7
13 and more	**22**	13.6	40.9	18.2	18.2	9.1	**8**	12.5	75.0	0.0	0.0	12.5
TOTAL	**504**	14.9	34.1	9.7	11.1	30.2	**563**	45.8	48.3	0.9	1.2	3.7

Table 4

Average daily drinking volume (%) by gender, age and education, SHS 1994

	MEN				WOMEN		
	n	1-160 ML	61-150 ML	150+	n	1-160 ML	61+ ML
AGE (YEARS)							
25-29	**53**	90.6	3.8	5.7	**38**	97.4	2.6
30-39	**112**	64.3	17.9	17.9	**73**	95.9	4.1
40-49	**109**	59.6	20.2	20.2	**76**	98.7	1.3
50-64	**155**	63.2	21.9	14.8	**118**	94.1	5.9
EDUCATION (YEARS)							
0	**29**	41.4	24.1	34.5	**20**	90.0	10.0
1-6	**188**	57.4	20.7	21.8	**131**	95.4	4.6
7-9	**118**	66.9	21.2	11.9	**110**	96.4	3.6
10-12	**72**	87.5	8.3	4.2	**37**	100.0	0.0
13 and more	**19**	94.7	5.3	0.0	**7**	100.0	0.0
TOTAL	**429**	66.0	18.2	15.9	**305**	96.1	3.9

OCCASIONAL DRINKERS HAVE BEEN CLASSIFIED IN THE CATEGORY 1-60 (ML/DAY)

Table 5

Drinking volume (%) by drinking frequency, male regular and occasional drinkers, SHS 1994

	MEN					WOMEN				
	n	<1/WEEK	1-2/WEEK	3-4/WEEK	DAILY	n	<1/WEEK	1-2/WEEK	3-4/WEEK	DAILY
1-60 ml/day	**283**	60.8	13.4	12.7	13.1	**293**	92.8	1.4	1.4	4.4
61-150 ml/day	**78**	0.0	7.0	14.0	57.0	**8**	0.0	12.5	25.0	62.5
150+ ml/day	**68**	0.0	5.9	8.8	85.3	**4**	0.0	0.0	25.0	75.0
TOTAL	**451**	38.1	10.9	12.4	33.7	**305**	89.2	1.6	2.3	6.9

OCCASIONAL DRINKERS HAVE BEEN CLASSIFIED IN THE CATEGORY 1-60 (ML/DAY)

Table 6

Responses to the CAGE questionnaire (%) by drinking frequency among male regular drinkers, SHS 1994

DRINKING FREQUENCY	1-2/WEEK (n=47)	3-4/WEEK (n=54)	DAILY (n=152)	P-VALUE
RESPONSE TO SPECIFIC ITEMS				
Cut down	66.0	81.5	82.9	0.039`
Annoyed	44.7	42.6	61.8	0.016
Guilty	31.9	50.0	54.6	0.025
Eye-opener	25.5	27.8	40.1	0.088
NUMBER OF POSITIVE ITEMS ON THE CAGE				
None	27.7	9.3	9.9	–
1	19.1	33.3	15.8	–
2	19.1	14.8	22.4	–
3	25.5	31.5	28.9	–
4	8.5	11.1	23.0	–

Table 7

Response to the CAGE questionnaire (%) by average daily drinking volume, male regular drinkers, SHS 1994

DRINKING VOLUME (ML/DAY)	1-60 (n=107)	61-150 (n=78)	150+ (n=68)	P-VALUE
RESPONSE TO SPECIFIC ITEMS				
Cut down	68.2	84.6	91.2	0.000
Annoyed	37.4	56.4	79.4	0.000
Guilty	40.2	50.0	63.2	0.012
Eye-opener	23.4	24.4	64.7	0.000
NUMBER OF POSITIVE ITEMS ON THE CAGE				
None	24.3	7.7	1.5	–
1	26.2	20.5	10.3	–
2	17.8	29.5	13.2	–
3	19.6	33.3	38.2	–
4	12.1	9.0	36.8	–

Table 8

Mean clinical and physiological measures by drinking volume, men, SHS 1994

DRINKING VOLUME	ABSTAINER	OCCASIONAL	1-60 ML/D	100-150 ML/D	>150 ML/D	ABSOLUTE DIFFERENCE	RELATIVE DIFFERENCE (%)	P (TREND)
CLINICAL VARIABLES (n)	**75**	**172**	**111**	**78**	**68**			
Body mass index (kg/m2)	24.0	24.6	23.8	25.4	23.3	-0.7	-2.9	0.591
Systolic blood pressure (mmHg)	130.8	135.6	137.9	147.9	141.1	10.3	7.9	0.000
Diastolic blood pressure (mmHg)	84.6	90.1	89.5	96.2	93.3	8.7	10.3	0.000
Smoking (%)	25.3	25.6	40.5	55.1	67.6	42.3	167.2	0.000
LIPIDS (n)	**74**	**169**	**110**	**77**	**68**			
Total cholesterol (mmol/l)	5.41	5.40	5.41	5.35	5.24	-0.17	-5.57	0.000
LDL-cholesterol (mmol/l)	3.46	3.28	3.18	3.00	2.78	-0.68	-3.96	0.000
Apo B (mg/l)	1.18	1.15	1.14	1.15	0.97	-0.21	-17.8	0.000
HDL-cholesterol (mmol/l)	1.36	1.45	1.53	1.57	1.88	0.52	38.2	0.000
Apo A (mg/l)	1.14	1.19	1.28	1.29	1.45	0.31	27.2	0.000
Lipoprotein(a) [median] (mg/l)	298	297	290	203	229	-69.0	-23.2	0.000
Triglyceride (mmol/l)	1.32	1.47	1.57	1.74	1.28	-0.04	-3.0	0.214
LpAI (mg/l)	0.48	0.51	0.52	0.52	0.59	0.11	22.9	0.000
LPAI:AII (mg/l)	0.27	0.31	0.35	0.36	0.39	0.12	44.4	0.000
HORMONES AND OTHER VARIABLES (n)	**32**	**94**	**60**	**47**	**48**			
Sex hormone binding globulin (mmol/l)	55.4	44.4	36.4	37.8	43	-12.40	-22.4	0.013
Free testosterone (nmol/l)	22.6	19.4	15.8	17.1	17.8	-4.80	-21.2	0.002
Estradiol (nmol/l)	0.16	0.15	0.12	0.14	0.14	-0.02	-12.5	0.264
Growth hormone (U/l) [n]]	1.53 [24]	NA	NA	1.64 [30]	1.85 [39]	0.32	20.9	0.162
Albumin (g/l)	44.8	45.2	49.9	45.9	45.8	1.00	2.2	0.331
Carbohydrate deficient transferin (U/l)	20.6	23.1	30.5	31.2	40.8	20.20	98.1	0.000
Thiamin (nmol/l) [n]	76.1 [19]	92.7 [33]	83.8 [15]	74.0 [14]	65.5 [16]	-0.14	10.3	0.138

Table 9

Adjusted regression coefficients of alcohol intake on selected variables, men, SHS 1994

DRINKING VOLUME	ABSTAINER	OCCASIONAL	1-60 ML/D	100-150 ML/D	>150 ML/D
CLINICAL VARIABLES (n)	**75**	**172**	**111**	**78**	**68**
Systolic blood pressure (mmHg)	–	7.44 *	9.92 **	17.4 **	13.7 **
Diastolic blood pressure (mmHg)	–	6.14 **	6.04 **	11.1 **	10.2 **
LIPIDS (n)	**74**	**169**	**110**	**77**	**68**
Total cholesterol (mmol/l)	–	-0.04	0.06	-0.11	0.00
LDL-cholesterol (mmol/l)	–	-0.20	-0.21	-0.49 *	-0.50 *
Apo B (mg/l)	–	-0.04	-0.02	-0.06	-0.15 *
HDL-cholesterol (mmol/l)	–	0.10	0.14 *	0.22 **	0.45 **
Apo A (mg/l)	–	0.05	0.12 **	0.14 **	0.29 **
Lipoprotein(a) (mg/l)	–	-13.5	17.2	-102 *	-21.8
Triglyceride (mmol/l)	–	0.11	0.30	0.36 *	0.11
LpAI (mg/l)	–	0.03	0.04	0.04	0.10 **
LPAI:AII (mg/l)	–	0.05 **	0.08 **	0.09 **	0.13 **
HORMONES AND OTHER VARIABLES (n)	**32**	**94**	**60**	**47**	**48**
Sex hormone binding globulin (mmol/l)	–	-9.26 **	-17.9 **	-15.6 **	-12.0 **
Free testosterone (nmol/l)	–	-3.55 **	-6.93 **	-5.04 **	-4.84 **
Estradiol (nmol/l)	–	-0.004	-0.041	-0.026	-0.023
Growth hormone (U/l) [n]	- [32]	NA	NA	0.06 [30]	-0.10 [39]
Albumin (g/l)	–	0.49	4.38	1.61	1.45
Carbohydrate deficient transferin (U/l)	–	2.38	9.24 *	11.5 **	17.9 **
Thiamin (nmol/l) [n]	- [19]	14.9 [33]	5.92 [15]	1.24 [14]	-12.8 [16]

*: <0.05 & >0.01; **: <0.001

REGRESSION MODELS INCLUDE THE VARIABLE OF INTEREST, AGE, BODY MASS INDEX AND SMOKING STATUS.

ABSTAINERS CONSTITUTE THE REFERENCE GROUP.

Biography

Pascal Bovet

He is a senior lecturer at the Institute of Social and Preventive Medicine of the University of Lausanne (Switzerland). He is also working as an epidemiologist consultant with the Ministry of Health of the Republic of Seychelles and he has been much involved with the development and implementation of a Program of Prevention and Control of Cardiovascular Disease in this country. Trained in Switzerland as a specialist in internal medicine, he later got a MPh degree in epidemiology and public health from the University of California of Los Angeles (UCLA) where he specialized in public health. His main research interest relates to epidemiological transition with a focus on cardiovascular diseases. He has conducted many epidemiological studies in the field of non-communicable diseases in the Seychelles islands (Indian Ocean) with subsequent publications.

Alcohol Consumption in India:

A Cross-Sectional Study

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Background

India is one of the largest democratic and a secular country in South Asia occupying almost 3% of the world's land area but supporting 866 million people (16.2% of the world's population). The society is multilingual, multi-religious and multiethnic. India's economy is mostly agrarian. There are 18 official languages in India, besides numerous local dialects in 25 states. The majority of Indian people live in rural areas (74%), about 52% are illiterate and 38% live below the poverty line. India has an annual per capita income of US $330 and belongs to the low-income economies of the world (World Bank Report, 1993).

Besides the use of cannabis and opium, alcohol consumption has been in existence in India for many centuries. However, the overall quantity, patterns of use and problems resulting from this consumption have shown significant changes during the last two decades. Data on alcohol-related problems are still scarce in India, with very few scientific comparable studies conducted so far. Alcohol production and sales data are also difficult to collect and collate for the Country, as these are not centrally compiled. Significant regional, cultural, gender and social class differences exist in the country which limits generalization of the results that are usually based on small cross-sectional representative samples. Despite these shortcomings, this study attempts to describe alcohol consumption patterns and associated problems in three different districts in India to describe the situation.

Historical background

Alcoholic beverages have been mentioned in ancient Indian literature (Chopra & Chopra, 1965; Prakash, 1961; Dikshitar, 1951; Charak Samhita, 1949). Alcohol is also an ingredient in many medicinal preparations in the traditional Indian system of medicine. But in spite of alcoholic beverages being known and available, these have never been a part of staple food in India. There were always strict rules and guidelines on who is allowed to drink and under what circumstances. Manu, for instance, strictly forbade drinking by Brahmins whereas other classes of society were allowed to drink, but only on specific occasions (like wars, religious events and festivals). Abstinence was considered the norm for the common man (Tekchand, 1972). Historical evidence suggests that alcohol use did not pose a significant health or social problem in ancient and medieval periods in India.

Under British rules, India witnessed a slow and steady rise in licit alcohol availability and consumption. There was a change in the types of beverages consumed, in the patterns of drinking as well as in the attitude of the society towards drinking alcohol, which continued even after India attained independence. The use of plant products such as cannabis and opium decreased in rural areas where agricultural advances took place and these products were replaced by alcohol (Deb, 1975). Home brewed alcohol remained a cottage industry and distilled beverages with higher concentration of alcohol gradually replaced traditional beverages. Better fermentation and distillation processes and packaging technology resulted in alcoholic beverages becoming a mass produced commercial item and improved intra-country transport facilities contributed to its easy availability.

Current scene

General population studies conducted in different parts of the country suggest prevalence rates of use of alcoholic beverages ranging between 23% and 74% among males. Women constitute over 90% of abstainers, though among tribal groups and tea plantation workers, there is a substantial number of alcohol users in women, with prevalence rates ranging between 28% and 48%. India is likely to face a heavy burden of medical and social problems due to increased alcohol consumption.

Settings of use

In both rural and urban settings in India, among folks or the elite, no significant normative patterns of drinking have yet emerged that could be held valid at national level. There is nevertheless a visible change in the pattern of drinking, as it has changed from ritualistic and occasional to a part of routine social interaction and entertainment. In general, alcohol is used only rarely for convivial purposes or in the evenings before dinner. The basic purpose of drinking alcohol is to get drunk as quickly as

possible and to stay drunk for as long as possible. This motivation is reflected among those between 25 and 40 years of age seeking treatment. In the Western and Southern parts of India, public bars and pubs have emerged and norms are thus only beginning to evolve.

Types of Alcoholic Beverages

India varies in its topography, climate, vegetation, culture and traditions. Therefore, different types of alcoholic beverages are consumed which can be broadly divided into the following categories. India made foreign liquor (IMFL) consists of whisky, rum, gin and brandy, with a 42.8% maximum alcohol content permitted. Whisky is the most popular drink in this category. Country liquor is a distilled alcoholic beverage made from locally available cheap raw material such as sugarcane, rice, palm, coconut and cheap grains with alcohol content around 40%. Common varieties of country liquor are "*arrack*", "*desi sharab*" and "*tar*i" (toddy). Illicit liquor is mostly produced clandestinely in small production units with raw materials similar to that used for country liquor. With no legal quality control checks on them, alcohol concentration of illicit liquor varies (up to 56%). Adulteration is quite frequent, industrial methylated spirit being a common adulterant, which occasionally causes incidents like mass poisoning with consumers losing their lives or suffering irreversible damage to the eyes. Cheaper than licensed country liquor, illicit liquor is popular among the poorer sections of the population. In many parts of India, illicit production of liquor and its marketing is like a cottage industry with each village having one or two units operating illegally.

Besides these, home production for self-consumption is also common in some parts of India. Lal and Singh (1978) observed that 45% of inhabitants reported producing their own liquors at home for personal consumption. Home fermentation and distillation is also common in several tribal areas in the country, especially the Northeast region of the country. Lastly is beer, with an alcohol content ranging between 5% and 9% and whose production and consumption is rapidly increasing.

Subjects and methods

The government health sector has laid emphasis on the creation of awareness and on the development of a basic infrastructure for treatment in the different states regarding this problem. In order to get a scientific database with comparable research methodology and applicability, the Health Ministry initiated pilot projects at three sites, namely Barabanki (UP), Mandsaur (MP), and Thoubal (Manipur). The database described in the following pages has been created from these three districts of India in 1996-97. A district is the lowest basic administrative unit in India. For convenience and developmental activities, it is further broken up into smaller units: Tehsils, blocks and villages. All three districts were surveyed using the same sampling procedures, with a response rate of 100%. In each district, 240 areas were surveyed with the goals of determining the magnitude and providing prevalence estimates of substance abuse disorders according to the DSM-III-R criteria. The division of 240 units into rural and urban areas was in proportion to their total weight within the district. Under rural and urban sectors, further areas were selected by proportional probability sampling techniques. About 50 households in each village were contacted in a systematic fashion, i.e. one every fifth or seventh households, depending on the total number of households in the village, was selected for an interview. A standardized questionnaire based on DSM III-R criteria was used. Because the three surveyed areas can in no ways be assumed to be representative of overall India, area-specific figures will be reported separately. Overall, 12,157 individuals from Lucknow, 10,296 from Mandsaur and 9566 from Thoubal were surveyed.

Study population

Mandsaur district

Mandsaur is an important district in the state of Madhya Pradesh in Central India. It has a total population of 1.5 million spread over 1580 villages and 17 towns. The district has 8 tehsils and an equal number of developmental blocks. About 70% of the population resides in rural areas. Under the Single Geneva Convention, it is allowed to cultivate opium legally over an area of 12,000 hectares.

The population in Mandsaur is economically backward with no or minimal educational achievements. The population includes varied ethnic subgroups belonging to different castes, some lower in the hierarchy of the social order like the Bawri, Chamar, Ahir, Kumhar, Darji and Gairi who carry out menial labor jobs, animal keeping, making of mud utensils, etc. The higher caste, the Thakurs and Rajputs are the landlords of the area. There are also some tribal sub-groups like the Bhils and the Banjaras. A village is generally divided with higher caste residents living on one side and lower castes on the farther end of the village. Most of the population is composed of agricultural laborers leading a hand to mouth existence and for whom raising the family is more important than spending money on alcohol. The village council also acts as the local guardian by discouraging excessive alcohol use by not allowing, for instance, excessive alcohol users to maintain their residence in the village. However, there are specific caste groups like the Rajputs, Yadavas, Meghvar who drink alcohol more than the other castes. Drinking occasions are associated with conviviality, being a good host and welcoming a guest. Individuals also perceive alcohol drinking as a means of recreation after a hard labor day in the fields. Alcohol drinking is generally done at home.

Barabanki district

Barabanki is an adjoining district of Lucknow, state capital of Uttar Pradesh. It has 2.42 million population, spread over 2087 villages in six tehsils and 16 developmental blocks. Predominantly a rural area (90%), the culture of raw opium in Barabanki is widely spread and the area has emerged in recent years as a major drug trafficking area. Use of country liquor is also prevalent, though most of the villages do not have liquor vends. The district characteristics are similar to that of its adjoining state outlined above.

Thoubal district

This district lies in valley region of the Manipur State in the Northeast of India. It has a population of about 3.0 millions under three Tehsils and twelve blocks. About 65% of the population resides in rural

areas. The district lies on the transit route of drug trafficking especially from Myanmar. Various ethnic groups that belong to different tribes each with a specific dialect occupy the region. The population is economically backward, mostly illiterate. The predominant occupation is cultivation and fish arming for men and cloth weaving for women. Thoubal district comprises tribal groups (about 8.8% of the total population of the country) among which traditional drinking patterns are prevalent. Both among the men and women, alcohol is viewed as a natural product, a gift of the god viewed both as food and medicine. It is mostly home brewed, with low alcohol content. The tribal groups have their own beliefs and attitudes for alcohol consumption in the day-to-day life. However, with planned economic development and widening contact of tribal groups with those from other parts of the country, distilled beverages are also becoming common for officially licensed liquor vends. The use of alcohol usually begins after a farmer returns from the field and continues till late evening. No mode of entertainment available is the most commonly cited reason for its use.

Survey methodology

A key informant, usually the head of the household, was interviewed for himself and on behalf of his family, for information on drug consumption, including alcohol, tobacco, cannabis and opioids. The information gathered using key informants was pilot-tested using cross validation with each individual in the household in a sub-set of respondents (n=1987), with high Kappa coefficients for concordance (Mohan *et al.*, 1992). To further ensure the validity of the information on frequency and quantity of alcohol consumption, this manuscript reports only on patterns of use of the primary respondent, namely the head of the household. All questionnaires were further checked for coding and other errors.

Measures of alcohol consumption

All data are from self-reports of individuals. The quantity and frequency of drinking questions were asked for the past 30 days, as this was easier to recall from memory. For those whose answers were positive for the past 30 days, questions on various problems due to alcohol use were further asked. A bottle of beer has 650 milliliters (ml) of contents with 26 ml (4%) of absolute alcohol. This means that a self-reported quantity of a bottle of beer was worked out as 13 ml of absolute alcohol whereas two bottles would be considered equivalent to 52 ml of pure alcohol. The same algorithm was used for toddy and wine. When consumption of more than 4 bottles was reported, the drinker was considered to have had 182 ml of pure alcohol. A bottle of India Made Country Liquor (IMCL) has 750 ml contents and contains 300 ml (40%) of absolute alcohol. Therefore, half a bottle was considered as being equivalent to 150 ml of pure alcohol whereas up to 1/8 of a bottle was considered as 37.3 ml of absolute alcohol.

Current drinkers were defined as those who report drinking in the last 30 days based on the following question: "What has been your usual quantity consumed on one drinking occasion during the past month?" with the possibility of answering 'Never' or the reported quantity, by type of beverage. For each beverage quantities, the respondent was asked to estimate its frequency of drinking such a quantity with the following possible answers:

- Less often than once a month
- Once a month
- 2-3 times a month
- Once a week
- Several times a week but not daily
- Daily
- Several times a day.

The quantity-frequency specific measure was used to estimate the monthly volume. Heavy drinkers were defined as those consuming 75 ml or more of absolute alcohol.

Drinking problems

The respondents were also asked whether they encountered the following drinking problems derived from the DSM III-R criteria:

- Can not limit use
- Preoccupied with drinking
- Given up social, occupational or recreational activities

- Often intoxicated when required to fulfill major obligations
- Drinks despite having physical/psychological problems
- Unable to cut down on drinking
- Increased the amount of alcohol intake to get the same effect
- Experienced three or more withdrawal symptoms
- Withdrawal avoidance.

Results

Abstention rates and frequency of drinking

The abstinence rate among women was observed to be above 97%. For that reason, only drinking patterns among males are presented. Table 1 shows that the prevalence of drinking in the last month among males ranged from 20.8% at Mandsaur to 37.5% at Thoubal. Drinking patterns alter with age. Up to 20 years males included fewer current drinkers than any other age categories. The proportion of current drinkers in Lucknow and Mandsaur increases with increasing age, up to 50 years where it starts to decline. In Thoubal, the highest proportion of current drinkers (42.9%) is in the 30 to 49 years of age group.

Heavier drinking

Among current drinkers, the prevalence of high monthly quantities of alcohol is very high, ranging between 66.7% and 92.9% in young men from Lucknow and Mandsaur respectively. Age was not strongly correlated with the prevalence of heavier drinking in any of the three sites.

Drinking problems

The prevalence of alcohol-related problems in the three investigated areas of India seems to be relatively high (Table 2). Overall, current drinkers from Thoubal reported alcohol-related problems in higher proportion than did those in the other two sites. For instance, 81.1% of men (versus 58% in Lucknow and Mandsaur) reported not being able to limit their use of alcohol and 80.3% reported being often intoxicated when required to fulfill major obligations (versus 62.8% in Lucknow and 43.4% in Mandsaur). Also, men from Thoubal were more numerous to report being unable to cut down on drinking (51.1%) and to have increased their amount of alcohol intake (44.4%). Finally, the prevalence of having reported giving up social, occupational or recreational activities was very low in Mandsaur (5%) whereas this prevalence was 35.3% in Lucknow and 40.1% in Thoubal. Among heavy drinkers, these prevalence rates also showed to be higher in Thoubal, compared to Lucknow and Mandsaur. Surprisingly, prevalence rates were not higher among heavier drinkers that they were among all current drinkers and all trends were as a consequence, similar.

Discussion

Alcohol consumption has been reported in India since ancient times but trends in the patterns and prevalence of use as well as alcohol-related problems have not been systematically studied. The Indian economy primarily is agrarian and monsoon dependent. About 40% of the population is at the subsistence levels, therefore homebrew from rice, millet and sugarcane are commonly consumed alcoholic beverages (alcohol content: 4-5% absolute ethanol). These are however believed to have changed over the past two decades. Distilled alcoholic beverages are most frequently consumed, with beer becoming more popular among young people. Besides these, illicit and locally brewed alcohol account for more than half of alcohol consumed, in terms of quantities. The policy of economic liberalization recently initiated by the government has allowed entry in India of national and multinational alcoholic brands especially spirits. This has led to a shift in beverage preference and a corresponding increase in the quantities of absolute alcohol consumption consumed.

The survey data shows that the prevalence of current alcohol use ranges between 20% and 38% among males which is also reflected in various epidemiological studies conducted during the last two decades (Deb & Jindal, 1975; Dube & Handa, 1971; Dube *et al.*, 1978; Elnagar *et al.*, 1971; Mohan *et al.*, 1978; Mohan *et al.*, 1979; Mohan *et al.*, 1980; Sethi & Manchanda, 1977; Sethi & Trivedi, 1979; Varma & Dang, 1980; Varma *et al.*, 1980). Among women, abstinence is still a cherished value and more than 90% of them remain abstinent. Interestingly, Thoubal have the highest prevalence of current alcohol use in the population compared to the other two districts. Despite this low prevalence of current use, heavy drinking is rather frequent among current users of alcohol.

In the three studied districts, current drinkers appear to experience lots of problems, probably due to a very high prevalence of heavy drinkers. Although comprehensive scientific evidence for alcohol-related health and social problems in India is lacking, the present data suggest indications that these are substantial. Rapid increase in alcohol consumption shall raise the probability of further increase in these problems in the coming years. No control of self drinking, preoccupation with drinking, neglect of duties under the influence of alcohol and a much larger number of men unsuccessfully attempting cutting down on their drinking were some of the problems frequently reported.

A distinct "drinking culture" may not be on the social canvas but the way in which social and economic forces are working may lead to drinking patterns which are likely to cause more adverse health consequences. According to Room (1989), India lies in the category of "dry cultures" but there is a tendency among those who drink to indulge in very heavy drinking. It should be noted here that India should be viewed as having a minority of current drinkers and among them, a majority of heavy drinkers.

Our study however carries important limitations that should be weighted for when attempting drawing conclusions on drinking patterns in India. For instance, our study population can in no way be assumed to represent the general population due to different age and gender structures, as well as to a high variability across regions. Also, only users of any intoxicant substances were retained as potential respondent. Despite these limitations, the available evidence suggests high levels of drinking and associated health and social problems are present among those who drink.

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Table 1

Prevalence of current drinking (have had a drink in the last month) (%) and of heavy drinkers (%) among male current drinkers, by region and age

	PREVALENCE OF CURRENT DRINKERS (LAST MONTH)		PREVALENCE OF HEAVY DRINKING AMONG CURRENT DRINKERS	
	n	%	n	%
LUCKNOW (YEARS)				
Overall	**12157**	27.1	**3374**	79.7
15-19	**247**	17.0	**242**	66.7
20-29	**2146**	23.5	**504**	81.3
30-49	**6323**	30.9	**1955**	79.2
50 and more	**3441**	19.6	**673**	79.9
MANDSAUR (YEARS)				
Overall	**10296**	20.8	**2146**	87.9
15-19	**410**	3.4	**14**	92.9
20-29	**2550**	17.8	**453**	88.9
30-49	**4843**	24.3	**1177**	89.5
50 and more	**2493**	20.1	**502**	83.3
THOUBAL (YEARS)				
Overall	**9566**	37.5	**3584**	89.0
15-19	**114**	11.4	**13**	92.3
20-29	**1570**	37.7	**592**	90.9
30-49	**5217**	42.9	**2238**	90.1
50 and more	**2665**	27.8	**741**	84.1

Table 2

Prevalence of drinking problems (%) among male current drinkers and heavy drinkers, by region

	CURRENT DRINKERS			HEAVY DRINKERS		
	LUCKNOW (n=3374)	MANDSAUR (n=2146)	THOUBAL (n=3584)	LUCKNOW (n=2689)	MANDSAUR (n=1887)	THOUBAL (n=3189)
Can not limit use	58.3	58.5	81.1	68.0	62.7	82.4
Preoccupied	21.3	25.2	40.1	24.6	26.9	42.3
Given up social, occupational or recreational activities	35.3	5.0	40.1	42.2	5.1	42.9
Often intoxicated when required to fulfil major obligations	62.8	43.4	80.3	71.0	45.8	83.5
Drinks despite having physical/ psychological problems	58.4	39.8	66.5	65.7	41.7	64.5
Unable to cut down on drinking	32.6	34.5	51.1	35.8	36.0	50.6
Increased the amount of intake to get the same effect	26.3	27.7	44.4	31.1	30.2	47.4
Experienced 3 or more withdrawal symptoms	23.2	40.4	36.8	25.2	41.8	37.0
Withdrawal avoidance	23.8	43.3	35.7	25.9	45.1	34.6

Biography

Davinder Mohan

He is a psychiatrist currently serving as the head of the Department of Psychiatry and in charge of the Drug Dependence Treatment Center at the All India Institute of Medical Sciences, New Delhi. He has a wide epidemiological research experience, with both national and international distinctions to his credit. He has been a mental health advisor to the Government of India. He has been a short term consultant and temporary advisor to the World Health Organization (WHO) on drug and alcohol-related issues. Dr Mohan has more than 100 publications in various national and international journals.

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Drinking patterns and related problems in a large general population sample in China

CHINA

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Background

China is the world's third largest country by area and the largest by population. The total area of China is about 9,600,000 square kilometres. More than one-fifth of the world's total population lives within China's borders. It was estimated that China's population was over 1.2 billion by the end of 1996 in Mainland China. The Chinese population is approximately 92 percent ethnic or Han Chinese. The remaining population represents more than 91 million people and belongs to 56 national minorities. Despite industrialisation, China continues to be a predominantly rural, agricultural nation. Nearly three-quarters of the population may be classified as rural. The annual gross national product (GNP) of China in 1996 was 6,756 billion RMB (US$824 billion), or about 5,634 RMB (US$678) per capita. Agricultural output (which also includes some small-scale industries in rural areas, forestry, and fishing) accounted for about 24 percent of domestic income and industrial output (which includes manufacturing, mining, electricity generation, and building and construction) accounted for 42 percent. Between 1965 and 1979, the gross domestic product grew at a rate of 6.4 percent per year and between 1981 and 1996, the increase was 10.0 percent annually. This is one of the largest growth rates in the world (State Statistical Bureau, 1997).

China has a long history of beverage making dating from Shang Dynasty (BC 1600-1110) (Xia, 1989). Problems related to drinking were negligible until the end of the 1970's for cultural, economic and ethnic reasons (Hao, 1995a). From the beginning of the 1980s, patterns of alcohol use in China have changed rapidly and increased use of alcohol is one reason for the interest in this area shown by health professionals. Among the most notable changes are an increase in the sales of alcoholic beverages, an increase in the per capita alcohol consumption and in the incidence of alcohol-related mental disorders, along with the economic boom and the increasing influences of Westernization (Shen *et al.*, 1987; Kang *et al.*, 1992; Cheng *et al.*, 1992, Collaborating Research Group, 1992; Zhang, 1993, Hao *et al.*, 1995a, Hao *et al.*, 1995b). Alcoholic beverage consumption increased almost ten times from the end of the Cultural Revolution in 1978 to 1996 (State Statistics Bureau, 1996; State Statistics Bureau, 1997) and the number of inpatients with alcohol-related mental disorders in 17 psychiatric hospitals increased more than four fold from 1980 to 1993 (Hao, 1994).

Beginning in the 1980s, several national and regional epidemiological surveys were conducted in China (Shen *et al.*, 1987; Kang *et al.*, 1992; Cheng *et al.*, 1992; Collaborating Research Group, 1992; Zhang, 1993, Hao *et al.*, 1995b). Most efforts were focused on ascertaining the prevalence rates of alcohol-related psychiatric disorders. The current study reports data from a major national survey conducted in China under the sponsorship of the China Medical Board, New York Inc. The goals of this study were:

- To obtain information on the drinking patterns of people in six areas in China;
- To describe the kinds of problems related to alcohol use and their rates of occurrence;
- To examine the relationship of demographic, cultural and economic factors, and alcohol consumption and occurrence of alcohol-related problems.

This paper mainly deals with the first two goals.

Methods

Samples and study populations

Sampling took place in five provinces in China: Hunan Province in the South central China, Anhui Province in the East part of China, Jilin Province in the Northeast part of China, Sichuan Province in the Southwest part of China (two sites) and Shandong Province in North part of China. The surveyed areas in the six sites were selected to represent, with obvious limitations, the broad range of cultures and economic development and demographic features in which alcohol-related problems were experienced. They were: city of Zixing in Hunan Province, the city of Fuyang in Anhui Province, Chengdu and Panzhihua cities and their adjacent rural areas in Sichuan Province and city of Jinan in Shangdong Province. From these areas, primary units were selected using a stratified probability sampling design. In all six sites, blocks in cities and natural villages in rural areas were selected with probability proportional to size from the primary units. Within those areas, households were selected in clusters. Respondents from these six areas were all individuals aged 15 to 65 years old. In accordance with established research practices in China, the investigators of the aforementioned study obtained verbal informed consent from the subjects after the procedures had been fully explained.

The study took place from October 1993 to December 1994. A total of 23,842 respondents were interviewed, of which 23,513 (98.6%) provided valid data. Overall the completion rate for the survey was 92.1%. Non-response was due to refusal (2.1%), contact not being made (4.6%) or other reasons (1.2%).

Measures

A questionnaire assessed demographic characteristics (e.g., gender, age, nationality, occupation, marital status, educational level, family income), drinking patterns (e.g., frequency of drinking, amounts of alcohol per drinking session, beverage preference, face flushing after drinking), attitudes towards drinking, reasons for drinking and not drinking and so on.

Drinking frequency

Drinking frequency was ascertained with the question, "How often have you had a drink containing alcohol in the previous 12 months?" Respondents were provided with the following possible responses:

- Never
- 1-12 times a year
- 2-4 times a month
- 2-3 times a week
- 4-5 times a week
- At least once a day.

In this study, a "current drinker" is a respondent who reported consumption of any alcohol in the 12 months preceding the interview. Abstainers are those who have never used alcohol in the 12 months preceding the interview.

Alcohol-related problems screening test (APST)

The screening test was based on the Diagnostic Interview Schedule, (DIS) (Department of Psychiatry, Washington University, 1985). It was developed by Professor Shen *et al.* at the Mental Health Institute, Beijing Medical University to take account of the socio-cultural background of the Chinese. There are 16 items in the test, each having two possible answers, "*yes*" or "*no*". The first two items deal with drinking amount and frequency and items 3 to 16 point at acute intoxication, craving, physical dependence, withdrawal symptoms and social dysfunction problems. If two "*yes*" answers are given (one of which must related to items 1 or 2), a positive result is obtained. The APST has been widely used for screening alcohol problems in epidemiological surveys in China since 1986 (Shen *et al.*, 1993). In a pilot study on the sensitivity and specificity of the questionnaire (Shen *et al.*, 1993) in Sichun Province, a total of 301 participants received the test. The DSM-III-R was used as the gold standard. Out of 149 positive results, 53 participants could be diagnosed as suffering from alcohol-related disorders according to DSM-III-R. Out of 152 of negative results, only one was diagnosed as suffering from alcohol-related disorders. The

sensitivity was 0.98 and specificity was 0.61. In another multi-center study, total sensitivity was 0.99 and specificity 0.74 (Shen *et al.*, 1993).

Structured interview on drinking-related problems

The Structured Interview focused mainly on the diagnosis of alcohol-related psychiatric disorders based on the DSM-III-R criteria (American Psychiatric Association, 1987). The Structured Interview also collected data on age of initial and heavy drinking, drinking-related physical damage and times of acute alcohol intoxication during the six months prior to the interview. A hierarchical diagnostic system was adopted in diagnosing abuse and dependence, uncomplicated alcohol withdrawal and withdrawal delirium, as well as alcohol amnesiac disorder and dementia associated with alcoholism.

Procedure

All respondents first answered the Alcohol Use Questionnaire. Respondents that drank on average three times a week or more, or drank more than 100 milliliters of pure alcohol per session were screened with the APST. Participants who were judged to be at high risk for alcohol-related problems by the APST were administered the Structured Interview. The Structured Interview was used to generate diagnoses of alcohol-related disorder.

Quality control

Interviewers were psychiatrists with at least five years of clinical experience. They were trained using a standard training manual for 7-10 days prior to the interviews. Lecture-type presentations were used to explain the purposes of the survey and the various sections of the questionnaires, the conception of psychoactive substance abuse and dependence and the diagnostic criteria of psychoactive substances in the DSM-III-R. Pilot studies were conducted after training in each site. Diagnosis reliabilities for pilot data ranged between 88.9% and 94.3%.

In order to maximise the response rates, interviewers were trained in techniques for gaining entry to a household and maintaining respondents' participation. Instructions also focused on guaranteeing respondents' anonymity, public relations efforts with the community and seeking the help of community leaders. Before the end of the survey, 10% of respondents with alcohol-related psychiatric disorders according to DSM-III-R and 100 respondents without problems were re-examined at each site. Both false-positive and false-negative rates were less than 5%. Interviewer reliability was greater than 90%.

Statistical methods

For categorical data, the chi-square statistics with Yates' continuity correction was used. The Student t-test, both dependent and independent was used for comparison of group means.

Results

Demographic characteristics

As shown in Table 1, the ratio of males to females in the sample was 1:0.96. The average age of the respondents was 36.3 years old. The mean age of males was significantly higher than that of their female counterparts (t=19.67, p < 0.0001). Han nationals constitute 85.5% of the sample while people of the Chorea and Yi minorities comprised 6.8% and 6.7% of the sample. 84.2% of the respondents were married. Males' education level was significantly higher than that of females (t=9.25, p < 0.0001).

Drinking frequency

From Table 2, we can see that the proportion of current drinkers in the study was 82.6%, 25.6% and 45.2% for males, females and total sample, respectively. Males had a much higher drinking rate than females (X2=7857.40, df=1, p < 0.0001). Table 2 also contains data on the reported frequency of drinking alcoholic beverages by socio-demographics. These data suggest that men and women differed greatly. More men than women were frequent users of alcoholic beverages. A majority of female current drinkers (90.0%) and 56.0% male current drinkers used alcohol beverages once a week or less, while 16.1% male drinkers and only 2.5% female drinkers drank at least once a day. The highest drinking rate in both males and females peaks at 30-49 years. In males, the higher educational level was, the higher the drinking rate and the lower the drinking frequency. Females also showed similar patterns.

Types of beverages

Preferences for beverages expressed by males and females are presented in Table 3. In men, "strong" spirits (i.e. those over 50% of pure alcohol, generally between 50% and 56%) were the beverages of choice with more than one third of men having selected these beverages as the preferred ones. Beer and "less strong" spirit (i.e. <50% of pure alcohol, generally between 30 and 38%) came second. Interestingly, women reported consuming more wine and beer than other beverages.

Reasons for drinking

Current drinkers were asked to indicate whether enumerated reasons for drinking applied to them. The reasons can be grouped into three distinct categories: social, psychological and physical. Social reasons include using alcohol in social activities for increasing intimacy. Psychological reasons mainly concern the increase of positive feelings (getting high, getting more confidence and stimulation and decreasing negative feelings). Finally, physical reasons include relief of craving and withdrawal symptoms. Reasons for drinking are shown in Table 4. Except for drinking to celebrate, all possible reasons were reported more frequently by men than by women, especially psychological and physical reasons.

Drinking problems

Table 5 shows the drinking-related problems reported by current drinkers. Compared with females, male drinkers had higher rates of drinking problems, females reporting alcohol-related problems very rarely.

Alcohol-related psychiatric disorders

Table 6 shows the major diagnoses of alcohol-related disorders based on the DSM-III-R, by socio-demographic characteristics. Prevalence rates in Table 6 are point prevalence rates with the exception of acute intoxication, which is a 6-month prevalence. In general, male drinkers had more psychiatric disorders than their female counterparts. A total of 1058 males and 14 females (M:F ratio=1:76) across the six sites were diagnosed as cases of alcohol dependence or alcohol abuse. The prevalence of alcohol-related psychiatric disorders also seems to be increasing with age and to differ according to the subject's occupation. Indeed, the prevalence of acute intoxication and alcohol dependence was higher among 'workers' and 'farmers' than among other occupations. These were also more prevalent among divorced and separated peoples. Few differences were found across educational and income levels.

Discussion

The project was not designed to describe drinking and related problems across the whole population of China, since the country has a large population with obvious cultural and economic variations. What was intended was a study of population samples from certain communities. Future research will be conducted in the same areas in an attempt to understand trends of alcohol and related problems. The results showed that alcohol was used more frequently by males than by females. Male respondents reported higher amounts of alcohol consumed per session. The rates of alcohol-related problems in males are higher than among females. The males', females' and overall prevalence rates of alcohol dependence were 6.6%, 0.1% and 3.4% respectively. Six-month prevalence rates of intoxication were 5.2%, 0.02% and 2.6% respectively. Unfortunately, it is almost impossible to have a sample that represents the whole China. Also, the proportion of farmers in the study was under-sampled, accounting for 8.0% of the sample. Therefore results might not be generalizable.

Physiological make-up

Asians are more affected by alcohol than the Americans and Europeans. Studies show that about a third of Asians do have flushing face after drinking, the rapid build-up of acetaldehyde in the blood upon drinking is considered to be attributable to a deficiency of low Km aldehyde dehydrogenase (ALDH2), which plays a major role in metabolising acetaldehyde (Mizoi, 1979). This deficiency is quite common among the Asian population but has not been reported among the Caucasian Population (Johnson, 1989). The high blood concentration of acetaldehyde leads to blushing, quickening of heart-beat, sweating and /or feeling sick after drinking, which is unnerving for them and hence might decrease their propensity to drink (Mizoi, 1983). Despite its plausibility, this hypothesis cannot explain the increase in Japanese and Koreans drinking and related problems.

Society and culture

A unique Chinese tradition emphasises drinking in social occasions and not when one is alone. This can not only improve social relationships, but also regulate the amount drunk as well as the frequency of drinking. Although the Chinese have a habit of giving and returning toasts, the main purpose of doing so is to create the atmosphere for people to enjoy themselves. Because of this habit, people tend to be aware of the amount they drink and hence, the amount they drink is unusually within the unwritten limit set by society. The Chinese almost always drink while they eat. Eating can delay the absorption of alcohol and increase the drinking time. Besides, it can give people enough protein, vitamins and minerals to help minimise the harm done by alcohol to the central nervous system and the body.

The Chinese generally object to females being smokers and/or drinkers. They believe that drinking creates a negative impression on females if they do drink a lot in social occasions. This, in a way, has affected the drinking behaviours of women. Our study indicates lower rates of drinking, of frequency of drinking and alcohol-related problems.

Economic development

Societal and cultural factors can explain why drinking prevalence and alcohol-related problems had been low in the past. The opening up of China led to a moderate increase in the influence of the West on Chinese traditions. However, the societal and cultural perspectives are not sufficient to explain the increase in alcohol consumption in China. Writers suggest that another important factor, which leads to the increase prevalence of alcohol-related problems, is the economic development of the country. The same reason may also explain why alcohol consumption was lower before the opening up of China.

In China, financial incomes and alcohol consumption increase concurrently. Before the political revolution and the opening up of the country, China was relatively poor and not yet industrialised. Productivity was low and people's income was mainly used for daily necessity. There was hardly a chance for people to spend their money on

luxurious items. Together with the fact that alcohol production was low, alcohol consumption was also low. Since the 1980s, people had sufficient earnings to keep themselves alive. There also had been an increase in alcohol production. The situation was becoming more apparent from 1985. Statistics show that in the period of 1952 and 1978, the average annual growth rate was about six per cent (the population growth rate more than two per cent). The rate of increase in alcoholic beverage production was 5.3% (State Statistic Bureau, 1991; Hao *et al.*, 1995c). From 1982 to 1995, the GNP has shown a 10% increased on average whereas the production of alcohol beverages is increasing at a rate of about 13.3% annually (State Statistical Bureau, 1996; State Statistical Bureau, 1996).

In conclusion, alcohol-related problems seem to be less severe in China, compared to developed countries. However, there is now a growing body of evidence to suggest that the use of alcohol and its health consequences and social problems associated with its abuse, has been steadily on the rise all over the country during the past two decades. Drinking-related health and social consequences will likely be a public health concern in the next century.

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Table 1

Demographic characteristics of study subjects (%)

	MALES	FEMALES	TOTAL
	n=11972	n=11541	n=23513
AGE (YEARS)			
≤19	1.2	3.0	2.1
20-29	27.9	33.7	30.7
30-49	52.1	49.5	50.8
≥50	18.7	13.8	16.3
EDUCATION (YEARS)			
0-6	18.5	26.6	22.4
7-9	31.5	27.0	29.3
10-12	30.1	30.9	30.5
≥13	19.9	15.5	17.8
NATIONALITY			
Han	87.1	84.0	85.5
Korean	8.0	5.6	6.8
Yi	4.3	9.3	6.7
Others	0.6	1.2	0.9
MARITAL STATUS			
Married	84.2	84.2	84.2
Single	14.6	13.9	14.2
Divorced/separated	0.7	0.7	0.7
Widowed	0.5	1.1	0.8
FAMILY INCOME			
1 (Low)	13.2	14.0	13.6
2	15.0	15.2	15.1
3	21.4	19.0	20.2
4	24.1	22.5	23.3
5	14.8	16.6	15.7
6 (High)	11.5	12.7	12.1
OCCUPATION			
Worker	52.1	36.9	44.6
Official	19.1	17.0	18.1
Intellectual	7.7	7.3	7.5
Farmer	8.0	18.4	13.1
Others	13.0	20.4	16.7

Table 2

Drinking frequency in the previous year (%) by socio-demographic characteristics

	n	NONE	1-12 TIMES /YEAR	2-4 TIMES /MONTH	2-3 TIMES /WEEK	4-5 TIMES /WEEK	>=1 TIME /DAY
OVERALL	**23513**	45.2	16.6	18.4	8.5	3.9	7.1
GENDER							
MALES	**11972**	17.4	17.2	29.4	15.3	7.4	13.3
FEMALES	**11541**	74.4	16.0	7.0	1.5	0.4	0.7
AGE (YEARS)							
MALES							
≤19	**149**	57.0	18.1	16.8	6.0	0.7	1.3
20-29	**3341**	20.7	21.2	34.7	13.8	4.4	5.1
30-49	**6238**	13.3	16.6	29.7	17.6	9.0	13.8
≥50	**2244**	21.5	12.7	21.7	11.9	7.6	24.7
FEMALES							
≤19	**342**	94.7	5.3	–	–	–	–
20-29	**3887**	79.0	15.1	4.9	0.7	0.3	–
30-49	**5716**	69.2	19.0	9.0	2.0	0.3	0.5
≥50	**1596**	76.8	10.1	6.9	2.5	1.0	2.8
EDUCATION (YEARS)							
MALES							
0-6	**2212**	26.0	11.9	18.6	10.0	7.3	26.3
7-9	**3774**	16.0	15.3	31.4	17.0	7.2	13.2
10-12	**3605**	15.7	19.2	31.6	16.2	8.1	9.3
≥13	**2381**	14.5	22.0	33.1	16.3	6.8	7.4
FEMALES							
0-6	**3066**	84.0	7.6	5.1	1.5	0.5	1.3
7-9	**3111**	72.2	18.8	6.8	1.4	0.4	0.5
10-12	**3570**	71.2	18.1	8.4	1.4	0.3	0.5
≥13	**1794**	67.9	21.6	8.1	2.0	0.2	0.2
MARITAL STATUS							
MALES							
Married	**10084**	15.9	16.2	28.9	16.1	8.2	14.7
Single	**1743**	25.9	23.2	33.1	11.0	2.8	4.0
Divorced/separated	**83**	16.9	13.3	26.5	14.5	7.2	21.7
Widowed	**62**	29.0	11.3	19.4	8.1	6.5	25.8

	n	NONE	1-12 TIMES /YEAR	2-4 TIMES /MONTH	2-3 TIMES /WEEK	4-5 TIMES /WEEK	>=1 TIME /DAY
FEMALES							
Married	**9722**	73.0	16.6	7.6	1.7	0.4	0.8
Single	**1607**	81.5	13.5	3.9	0.9	0.2	–
Divorced/separated	**80**	82.5	7.5	10.0	–	–	–
Widowed	**132**	81.8	10.6	4.5	1.5	1.5	–
INCOME MALES							
1 (Low)	**1583**	22.0	16.0	27.1	12.6	8.2	14.1
2	**1796**	15.6	14.6	31.4	17.1	8.6	12.7
3	**2560**	12.9	14.6	34.5	17.0	9.2	11.8
4	**2887**	16.3	16.9	30.8	14.4	7.5	14.1
5	**1771**	18.6	22.7	23.9	17.0	5.0	12.9
6 (High)	**1375**	23.9	20.3	24.4	12.9	4.1	14.4
FEMALES							
1 (Low)	**1617**	80.6	10.8	5.8	1.6	0.6	0.6
2	**1760**	71.1	18.3	7.4	1.8	0.3	1.0
3	**2192**	66.9	19.0	11.4	1.6	0.5	0.6
4	**2592**	68.3	20.5	7.8	2.2	0.6	0.7
5	**1914**	81.1	13.7	4.1	0.8	–	0.3
6 (High)	**1466**	84.6	9.9	4.0	0.7	0.1	0.7
OCCUPATION MALES							
Worker	**6242**	13.8	16.3	32.2	15.9	7.2	14.6
Official	**228**	13.2	19.5	31.0	18.6	9.4	8.4
Intellectual	**925**	19.5	25.0	31.1	13.6	4.1	6.7
Farmer	**957**	43.4	11.1	15.9	8.9	7.0	13.6
Others	**1560**	21.3	16.3	23.1	13.3	7.1	18.9
FEMALES							
Worker	**4255**	68.2	21.0	8.5	1.3	0.4	0.6
Official	**1962**	68.6	19.3	9.4	2.0	–	0.6
Professional	**841**	76.8	15.1	6.7	1.2	–	0.2
Farmer	**2124**	89.8	4.1	3.1	1.2	0.5	1.2
Others	**2359**	75.6	15.3	6.0	1.9	0.7	0.5

Table 3

Type of beverages consumed (%) in current drinkers, by gender

	n	"STRONG" SPIRITS	"LESS STRONG" SPIRITS	WINE	BEER	YELLOW WINE	OTHERS
OVERALL	**12813**	33.0	22.5	12.4	29.3	1.2	1.6
GENDER							
Males	**9870**	38.2	25.7	5.4	28.3	1.2	1.1
Females	**2943**	15.0	11.5	36.1	32.7	1.3	3.4

Table 4

Reasons for drinking (%) in current drinkers, by gender

	MALES n=9870	FEMALES n=2943	TOTAL n=12813
Sociable	70.0	66.6	69.2
A good way to celebrate	75.1	79.7	76.2
Improving friendship	68.8	60.2	66.8
As a part of meal	29.7	17.3	26.8
Reducing boredom	26.3	16.1	23.9
Increasing excitement	25.4	15.3	23.0
Forget distress	26.8	18.0	24.8
Increasing confidence	27.7	17.6	25.3
Relieving fatigue	40.2	24.3	36.6
Reducing restlessness	26.8	16.7	24.5
Morning or night drinking	19.9	12.3	18.1
Relieving withdrawal	20.2	13.6	18.7

Table 5

Drinking problems (%) in current drinkers, by gender

	MALES n=9870	FEMALES n=2943	TOTAL n=12813
Blackout	9.2	0.4	7.1
Cannot stop	12.0	0.6	9.4
Loss of control	3.6	–	2.7
Drinking despite disease	5.5	0.3	4.3
Complaining by family	12.4	1.0	9.7
Conflict with others	2.7	–	2.1
Tremor	1.3	0.1	1.0
Binges	1.2	–	1.0
Interfering with work	0.9	–	0.7
Accident after drinking	2.0	–	1.5
Be punished by authorities after drinking	0.2	–	0.2
Be fired	0.2	–	0.2

Table 6

Alcohol-related disorders according to the DSM-III-R (%), by socio-demographic characteristics

		ACUTE INTOXICATION	DEPENDENCE	ABUSE	UNCOMPLICATED WITHDRAWAL	WITHDRAWAL DELIRIUM	DEMENTIA	AMNESIA	PERSONALITY DISORDER	HALLUCINATIONS
OVERALL	**23513**	2.6	3.4	1.1	0.4	–	–	0.1	0.1	0.1
GENDER										
Males	**11972**	5.2	6.6	2.2	0.8	0.1	0.1	0.3	0.2	0.2
Females	**11541**	–	0.1	–	–	–	–	–	–	–
AGE (YEARS)										
≤19	**491**	0.2	0.2	0.4	–	–	–	–	–	–
20-29	**7228**	1.8	1.1	1.0	0.0	–	–	0.1	–	–
30-49	**11954**	3.4	4.0	1.1	0.5	0.0	0.0	0.1	0.1	0.1
≥50	**3840**	2.3	6.5	1.4	1.1	0.1	0.3	0.5	0.4	0.3
OCCUPATION						0.1				
Worker	**10497**	3.6	4.3	1.5	0.6	–	0.1	0.1	0.1	–
Official	**4250**	2.7	2.8	1.1	0.2	–	–	–	–	–
Professional	**1766**	1.6	1.2	0.6	0.2	0.1	–	0.1	–	0.1
Farmer	**3081**	1.4	3.4	1.1	0.4	0.1	0.2	0.2	0.4	0.2
Others	3919	1.5	2.9	0.4	0.4	0.1	0.2	0.2	0.2	0.1
MARITAL STATUS										
Married	**19806**	2.8	3.9	1.1	0.5	0.1	0.1	0.1	0.1	0.1
Single	**3350**	1.7	0.8	1.1	–	–	–	–	–	–
Divorced/separated	**163**	4.9	6.1	3.1	1.8	–	–	–	–	–
Widowed	**194**	1.5	3.1	2.6	1.0	–	1.0	1.5	1.0	–
EDUCATION (YEARS)										
6	**5278**	2.2	5.1	1.5	0.8	0.1	0.3	0.3	0.3	0.2
7-9	**6885**	2.9	3.7	1.2	0.4	–	–	0.1	–	–
10-12	**7175**	3.0	2.8	1.0	0.4	–	–	0.1	0.1	0.1
≥ 13	**4175**	2.2	2.0	0.8	0.1	–	–	–	–	–
INCOME										
1 (Low)	**3200**	2.1	2.8	1.0	0.5	0.1	0.1	0.3	0.2	0.1
2	**3556**	2.6	3.2	0.8	0.3	–	0.1	0.1	0.1	0.1
3	**4752**	3.2	3.3	0.9	0.3	0.1	–	0.1	0.2	0.1
4	**5479**	3.9	4.6	1.2	0.5	0.1	0.1	0.1	0.1	0.1
5	**3685**	1.3	3.2	1.2	0.6	–	0.1	–	0.1	–
6 (High)	**2841**	1.7	2.7	1.7	0.3	–	0.1	0.1	–	0.1

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Sketching the diversity of drinking

and planning the palette

for the future

CONCLUSION

Andrée Demers

Robin Room

Chantal Bourgault

Varying patterns of drinking, different rates of reported problems

These monograph reports on the drinking patterns and problems in seven developing countries from different regions of the world, based on surveys conducted in the 1990s or in the late 1980s. It is impossible to compare the drinking patterns and the rate of alcohol-related problems across those countries systematically, since different measures and different methodology had been used to gather the data. Nevertheless, it is apparent from these studies that there is a lot of variation in drinking patterns, and thereby in the drinking cultures, among developing countries. These differences go further than the extent to which drinking is spread over the population, as indicated by the prevalence of drinkers. These differences also concern who is socially allowed to drink, and who is not, as well as how it is socially acceptable to drink. Some crude image of those differences can be drawn.

For instance, in India, drinking is exclusively a male behaviour; less than 3% of the Indian women reported drinking on some occasion in a period of one month. But even for men, drinking appears as a marginal behaviour, with between 21% and 38% of them, according to the region, reporting drinking in a one-month period. On the other hand, among Indian men who do drink at all, most are at least occasionally heavy drinkers and display a high rate of alcohol-related problems. According to the data presented in this monograph, Indians seem to be either abstainers or heavy drinkers, moderate drinking remaining an abstract idea. In India, a drink does not go without few others. Nevertheless, this image may be slightly distorted, as the detailed questions of drinking excluded the occasional drinkers who drink less than monthly.

This dual pattern of drinking is also observed in Nigeria. The prevalence of male drinking is higher than in India (54%), but this rate refers to a one-year period (drinking rate in the last month: 52%). As in India, Nigerians seem to be either abstainers or heavy drinkers: 46% of the Nigerian men did not drink at all in the preceding year, while 43% drank 3 times or more a week; of these latter, more than 70% could be considered heavy drinkers. The rate of alcohol-related problems among drinkers also appears to be quite high. Unfortunately, no data were available on Nigerian women. However, we learn from other sources that "*it was considered an absurdity for a woman to drink, and female intoxication was unheard of. Only in very special circumstances, such as traditional religious festivals, christenings, and similar social functions where alcohol was considered culturally appropriate for all present to partake, could women be administrated a measured quantity*" (Ikuesan, 1994, p.941).

In other African countries, like Namibia or Seychelles, drinking patterns appear to be quite different. In Namibia, drinking is not a male prerogative. Close to 50% of adult women and 61% of men reported drinking in the last year, and among both men and women most of the drinkers are regular weekly drinkers. The rate of heavy drinking is not as high as in Nigeria or India (26% of male drinkers in Namibia reported heavy drinking at least once a month and 15% of female drinkers), but the rate of alcohol-related problems is far from trivial, particularly for men. For instance, over a three- month period, 40% of men drinkers reported being unable to stop drinking and 37% needing a drink first in the morning. In Seychelles, even if 54% of adult women reported drinking (compared to 85% among men), most of them (89%) do not drink on a weekly basis, a pattern also observed to some extent for Namibian women.

In China, Mexico and Costa Rica, drinking appears to be mainly a man's privilege, with respectively 86%, 70% and 55% of the male adult population reporting drinking. Notwithstanding, female drinking is not as strongly socially disapproved as it is in India – in these three countries, between 26% and 36% of adult women reported drinking once in a while. Chinese, Mexican and Costa Rican male drinking patterns seem to be more heterogeneous than in India, Nigeria or Namibia, with relatively large proportions of occasional drinkers. Nevertheless, 44% of the Mexican and 34% of the Costa Rican male drinkers reported drinking a large quantity at least once a month (not available for the Chinese sample). Interestingly, the rate of reported alcohol-related problems is relatively low in China.

Many factors may contribute to these differences in drinking cultures and patterns. Women's role and the social control of women, including of female

drinking, is obviously one of such factor. Religion is probably also at play. For instance, alcohol is prohibited in the Moslem religion and, as can be seen from the Nigerian data, 73% of the Moslems reported being abstainers, compared to 30% of the Christians. The role of education is more ambiguous. No general rule can be derived from the studies presented in this monograph. In some countries (for instance in China and Costa Rica), drinking seems to increase with education but in other countries (for instance Nigeria, Seychelles, Namibia and Mexico) no clear trend emerges.

Chinese and Nigerian's surveys also asked about reasons for drinking. In China, reasons related to sociability are clearly the most important, whereas the response pattern in Nigeria seems to be more ambivalent, and mood-related reasons seem to be as important as sociability.

Such differences in culturally situated motivations for drinking may explain, at least in part, the difference in the drinking patterns and in the rates of alcohol-related problems in the two samples. But other factors are also likely to be involved in such differences. These include the accessibility and availability of alcohol, including its price (Edwards *et al.*, 1994). In developing countries, homebrewed beverages may be particularly important in this regard, as they may represent a large part of the alcohol consumed (see Bovet, in this monograph) and are often ingrained in the local tradition. Finally, it is notable that India and Nigeria, the two countries who display the lower prevalence of drinking but high prevalence of heavy drinking and alcohol-related problems, are also the two countries among the seven in this monograph who display the lowest level of development according to the Human Development Index. Hence, macro socio-economic factors may also be at play.

Obviously, more research, including ethnological research, needs to be done to understand drinking cultures, patterns and alcohol-related problems and their interrelations in developing countries, and to understand the role of social and economic development in this regard.

Implications for future epidemiological surveys

To be effective, alcohol policies need to be based on data and responsive to changes and trends in the society. Many different sources can contribute to the necessary data, but periodic surveys of the general population provide information that is hard to get any other way. As noted in the introduction, this includes information on the extent of alcohol consumed that is not reported in official statistics. Surveys are also a primary means of obtaining information on the distribution of patterns of drinking and of abstaining in the society, including the extent and social location of both sporadic and long-term heavy drinking. With questions about problems related to drinking, a population survey can contribute information not otherwise available on the impact of alcohol on family relations and other aspects of everyday life. Analyses of the relation between drinking patterns and particular alcohol-related problems are potentially crucial information in designing prevention and intervention measures. For all these reasons, we may expect more attention to alcohol issues in future general-population surveys oriented to public health and order in developing countries.

A survey questionnaire for use in a particular society needs to be attuned not only to the research and policy questions important to that society but also to its particular social customs and patterns. Nevertheless, it can also be helpful to draw on international experience in constructing the questionnaire. Besides taking advantage of others' experience, this gives an opportunity for cross-national comparisons, which are of considerable research significance, and can also be helpful to policy (Room, 1988). The recently published international guide for monitoring alcohol consumption and related harm by the WHO (2000) also recommends standardized methodologies to improve data collection and comparability and can be helpful when planning surveys on alcohol consumption.

Recently, there has been considerable convergence among those involved in drinking surveys on priorities in asking questions about the pattern and amount of drinking (Dawson & Room,forthcoming).

At a minimum, researchers are advised to ask about the frequency of drinking – to what extent drinking is a regular part of the respondent's life – and also about the intensity of drinking – whether and how often the respondent drinks above a potential threshold for intoxication (e.g., 60 gm. of ethanol, or about 5 or 6 drinks). In addition, asking a question about usual quantity of drinking on an occasion also allows computation of a measure of volume of drinking. Such questions will allow analyses in terms of the two most basic dimensions that have been put forward for characterising the role of alcohol in a culture (Room and Mäkelä, 2000).

There is yet less agreement on what to ask concerning alcohol-related problems (Dawson & Room, forthcoming). A common practice in surveys in developing societies has been to use screening measures for alcoholism, such as the MAST (Selzer, 1971), CAGE (Ewing, 1984), or AUDIT (Saunders *et al.*, 1993). But the MAST and CAGE were developed and validated for clinical populations in particular cultural contexts and their applicability in the general population (Bisson *et al.*, 1999) and in the very different contexts of many developing societies is questionable (Klausner and Foulks, 1982). Furthermore, asking questions on a lifetime basis, as both these measures do, seriously reduce the utility of "risk curve" analyses cross-tabulating current drinking patterns with problems. The AUDIT is less problematic since it was developed in a cross-cultural study and confines its questions to the current year (Saunders *et al.*, 1993). But it combines answers on drinking patterns and alcohol-related problems in a single score and its coverage of social problems from drinking is minimal. An alternative or additional measure, which might be considered for use, asks about harm to different life-areas from the respondent's drinking (Rehm *et al.*, 1999).

An alternative approach is to ask questions about problems from drinking in the frame of psychiatric epidemiology. This involves using a quite extended series of questions in a diagnostic interview schedule. Such methods have been used in developing societies (Helzer & Canino, 1992), and have shown acceptable test-retest reliability (Üstün *et al.*, 1997). But such analyses are usually at the level of just one or two alcohol-specific diagnoses – diagnoses, which may not always be suited to the developing-country circumstances (Room *et al.*, 1996). And from the perspective of a closer understanding of patterns for policy purposes, it can be argued that it is usually more productive to analyse alcohol-related problems at the level of specific items or smaller groups of items. Such items should extend beyond the limits of the diagnoses to include social problems from drinking.

A third approach, which has not so far been well-developed in the alcohol field, is to ask questions about the impacts of other people's drinking on the respondent (Dawson & Room, forthcoming; Room, forthcoming-a). Just as surveys of the victims of crime (see Greenfield, 1998) have become an important part of monitoring trends in crime and criminal policy, survey items on the adverse impacts of the drinking of others may make an important contribution in the future to alcohol problems monitoring.

Besides patterns of drinking and the occurrence of alcohol-related problems, several further areas of questioning should be considered in constructing future alcohol surveys in developing societies. Mapping the contexts of drinking and the association of different contexts with particular patterns of hazardous drinking or alcohol-related problems may make an important contribution to context-specific prevention strategies (e.g., Demers, 1997). Asking about attitudes and norms to drinking and their change over time (e.g., Greenfield & Room, 1997) can contribute greatly to an understanding of shifts in popular sentiments, which underlie shifts in drinking practices. In addition, questions about attitudes toward policies and other strategies for preventing alcohol problems and their changes over time (e.g., Giesbrecht & Greenfield, 1999) can yield information on public opinion essential to adopting sustainable and effective policies. Future surveys should also be designed to capture the role of the social environment on drinking, of how drinking is shaped at the family and the community level (e.g. Rice *et al.*, 1998; Twigg *et al.*, 2000). It is obvious from the data presented in this monograph that there are also important variations related to community characteristics that should be measured. These areas of questioning, of course, go beyond the focus of the present monograph.

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