Alcohol, Gender, Culture and Harms in the Americas

PAHO Multicentric Study Final Report

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This project was coordinated by Dr Maristela G. Monteiro, Regional Advisor on Alcohol and Substance Abuse at PAHO, in collaboration with Prof Dr Jurgen Rehm, from the CAMH.

Executive Summary

Alcohol is a major risk factor for mortality and morbidity in the Americas. Overall in the Americas, alcohol consumption levels are higher than the global average while abstention rates for both men and women are consistently lower. In terms of the burden of disease, alcohol caused approximately 323,000 deaths, 6.5 million years of life lost, and 14.6 million disability-adjusted life-years in the region of the Americas, encompassing both acute and chronic disease outcomes from newborns to the elderly in the year 2002. Men have higher levels of all alcohol-attributable burdens of disease compared to women, which can be attributed mainly to their alcohol consumption profile, both in terms of higher total volume and more harmful patterns of drinking, including heavy episodic drinking.

Data from the Multicentric Study on Gender, Alcohol, Culture and Harm, sponsored by PAHO are shown to highlight alcohol consumption profiles and alcohol-related predictors and outcomes for 10 countries in 2005: Argentina, Belize, Brazil, Canada, Costa Rica, Nicaragua, Mexico, Peru, Uruguay and USA. Data from Argentina, Canada, Costa Rica, Mexico, Uruguay and USA were previously collected as part of the international study on Gender, Alcohol and Culture (GENACIS). New data using comparable indicators were collected from Belize, Brazil, Nicaragua and Peru. Wide differences were seen in volume of alcohol consumption and heavy episodic drinking between countries, even those classified in the same WHO sub region. This new survey data highlight the importance of disaggregating sub regional WHO data to the country level in order to see differences in consumption and corresponding risk of alcohol –attributable outcomes at the country level and thus inform country-specific alcohol policies capable of addressing the specific alcohol consumption profiles and problems.

[1] ***Classification of countries in the Americas by childhood and adult mortality***

America A	America B	America D
very low childhood and very low adult mortality	low high childhood and low adult mortality	high childhood and high adult mortality
Canada, Cuba, United States of America	Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Brazil, Chile, Colombia, Costa Rica, Dominica, Dominican Republic, El Salvador, Grenada, Guyana, Honduras, Jamaica, Mexico, Panama, Paraguay, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela	Bolivia, Ecuador, Guatemala, Haiti, Nicaragua, Peru

Definition of regions: *The regional subgroupings used were defined by WHO (World Health Report 2000; 6) on the basis of high, medium or low levels of adult and of infant mortality.*

Introduction

Alcohol is a major risk factor for death and burden of disease globally (Ezzati et al. 2002; 2004; WHO 2002; Lopez et al. 2006; for details on alcohol see Rehm et al. 2006a; b; 2004). This has also been found to be the case in the region of the Americas where, in 2000, alcohol ranked first among contributors to burden of disease for both AMR B (e.g. Mexico, Brazil) and AMR D (e.g. Peru), and ranked second behind smoking for AMR A (e.g. United States, Canada; (Rehm & Monteiro 2005; WHO 2002). [1]

Both average (per capita) volume of alcohol consumption and different patterns of drinking contribute to this disease burden (Rehm et al., 2003c; 2004; Greenfield, 2001). Patterns of drinking are conceptualized here as a moderator variable, which determines the level of harm associated with a constant volume of exposure, and, in the case of disease outcomes such as CHD, even whether the effect of alcohol is beneficial or detrimental (Rehm et al., 2003d).

In addition to alcohol-related disease burden, there are marked social consequences stemming from alcohol use, e.g., family and personal relationships, violence, work, economic problems, child abuse and neglect (Klingemann & Gmel, 2001; Room et al., 2002, 2003). While in some established market economies, the costs of alcohol-related social problems outweigh the costs of alcohol-related health problems, we have no knowledge about this relationship for developing countries.

Alcohol is also a gender issue. There are known differences between men and women in how much and how they drink, and the type and extent of resulting health and social consequences (Rehm et al., 2004). In addition, women are more likely than men to suffer not only from their own drinking behaviour but also from their partner's drinking behaviour and harmful consequences of their partner's behaviour, including domestic violence, traffic injuries and economic burden (Room et al, 2002).

Despite the alarming estimates by WHO, alcohol-related issues continue to be a low priority in the health agendas of most countries in the region of the Americas, and epidemiological information on alcohol consumption and related problems among men and women is scarce. Many countries in the region have never had national or large surveys on alcohol consumption, patterns of alcohol use, and related consequences, and have not undertaken a gender analysis of these variables.

Theoretical Background on Gender, Alcohol and Alcohol-Related Harm

Parallel to the development of international research on drinking behavior, there has been increasing attention to gender influences on drinking patterns and problems, encouraged by the growth of research on women's drinking. Awareness of how women's drinking and related problems differ from men's has grown because of survey research in many countries, including the US, Canada, Finland, Sweden, the Netherlands, Germany, Mexico, and the Czech Republic. This quantitative research has been complemented by a growing number of ethnographic studies on differences between men's and women's drinking (e.g., Gefou-Madianou, 1992; McDonald, 1994).

A major limitation of international comparative analyses on men's and women's drinking behavior has been the limited set of comparable questions and measures available in existing data sets. There is a clear need for comparative research and coordinated analysis of data from new surveys using similar questions or variables about drinking, drinking problems, and their possible correlates. Such a multi-national approach can greatly improve our understanding of how individual and societal characteristics influence women's and men's drinking behavior, and the development of gender-sensitive alcohol measurement and alcohol policies.

These considerations had been the basis for the multinational study on gender, alcohol and culture (GENACIS), which uses a standardized set of questions and variables in representative surveys of the general population to compare the levels of alcohol consumption, patterns of alcohol use and related problems between men and women within and between different countries and cultures across the globe. Data is being collected and analyzed from over 40 countries from all world regions, with core financial support from the World Health Organization (for developing countries), the National Institute on Alcohol Abuse and Alcoholism (NIAAA, for the US and meetings of the International Research Group on Gender and Alcohol) and the European Union (for European countries) (Wilsnack and Wilsnack 2002; Wilsnack et al 2005).

With respect to the Americas region within the GENACIS study, WHO and PAHO have supported surveys in Argentina, Costa Rica and Uruguay, and national funding sources supported studies in Brazil, Canada, Mexico and the USA.

The methodology available and the expertise built in the region as a result of participating in GENACIS could be utilized to involve other countries, generate new data and increase the knowledge base on the relationship between gender, alcohol and harm in the region of the Americas. Existing and new data sets would allow for within country and international comparisons on gender differences in alcohol consumption, patterns

of alcohol use and problems. Better understanding of the nature and extent of alcohol consumption and problems would provide critical information for the implementation of more effective policies, adapted for regional and national characteristics.

Within this framework, the PAHO Multicentric Study on Alcohol, Gender, Culture and Harm was undertaken, by merging datasets from studies undertaken as part of GENACIS in 6 countries, and new data collected and analysed in 4 countries, under the overall coordination and technical support of the Pan American Health Organization and the Centre for Addiction and Mental Health, a PAHO/WHO Collaborating Centre. The present report is the final report of the study and it aims at providing the first insight into the richness of the database, although many more analyses will be undertaken and disseminated in future publications in scientific journals.

For this report, 2002 data on both exposure and burden of disease in terms of the alcohol-attributable mortality and disability in the region of the Americas was utilized, along with data gathered in 6 countries of the region through the international study on alcohol, gender and culture (GENACIS), sponsored by WHO, NIAAA and the EU, new data collected in 4 countries (Belize, Brazil, Peru and Nicaragua) using a very similar instrument to the one used by GENACIS and sponsored by PAHO. New data was collected São Paulo city, Brazil, sponsored by the Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP), and then integrated data analysis of all data, coordinated through the Multicentric Study on Alcohol, Gender, Culture and Harm, sponsored by PAHO. The work on the second Brazilian study was supported by the National Secretary on Drugs (SENAD), the arm of the Brazilian Government that is concerned with drug related policy. The integrated data allows for within and between-country comparisons based on the 5 main objectives of this study:

(1) Comparisons of men's and women's drinking patterns within countries, and comparisons of drinking patterns among women and among men, and gender differences in drinking patterns, across countries. Previous international studies have compared men's and women's drinking patterns by constructing common reporting units (e.g., mean monthly consumption, frequency of drinking, and frequency of heavy episodic drinking) from existing survey data (e.g., Vogeltanz-Holm et al, 2004; Wilsnack et al, 2000). However, different countries have used different questions, response categories, and assumptions in past surveys, limiting the ability of researchers to derive comparable measurements of drinking. Data based on the same methods of measuring drinking behavior will allow comparisons to be analyzed more directly and more precisely.

(2) Comparisons of men's and women's prevalence of alcohol-related problems within countries, and comparisons of the prevalence of alcohol-related problems among women and among men, and gender differences in problem prevalence, across countries. Such comparisons have been difficult across countries because each country has looked most closely at somewhat different lists of behavioral problems and symptoms of alcohol dependence. Apart from methodological studies (such as those for developing the AUDIT questionnaire - WHO, 2002; or the WHO study on the reliability and validity of dependence measures - Üstün et al., 1997), the proposed analyses will

be among the first cross-national comparisons of prevalence rates of alcohol-related problems in the region, particularly for comparing women's and men's rates.

(3) Comparisons of individual-level predictors of men's and women's alcohol consumption and alcohol-related problems, within countries and across countries. Past studies have identified a large set of possible individual-level predictors of levels of alcohol consumption and risks of alcohol-related problems, among women and/or men who drink. Possible predictors will include physical characteristics (height, weight, age), and characteristics of marital and family relationships; social networks; sexual experiences; experiences of abuse; employment experiences and conditions; and characteristics related to socioeconomic status (e.g., income, education, and occupational status). Bivariate and multivariate analyses will aim to reveal how consistently or differently these variables are related to patterns of alcohol consumption and related problems among male and female drinkers within and across countries.

(4) Analyses of societal-level predictors of women's and men's alcohol consumption and alcohol-related problems. The diversity of countries in the proposed study will allow analyses of societal characteristics (a) as possible predictors of patterns of men's and women's alcohol consumption and related problems across societies, and (b) as possible modifiers of associations with individual-level predictors for women and men in each society studied. Societal characteristics to be evaluated as possible predictors or modifiers are likely to include measures of men's and women's role inequality (i.e., degree of women's "emancipation"); the "wetness" or "dryness" of a society's drinking culture (i.e., to what extent alcohol use is integrated into and compatible with everyday activities, versus engaged in as an exceptional activity apart from everyday activities); measures of living standards and economic development; measures of economic and income inequality and demographic transition state (Castille-Salgado, 2000); and measures of survey means and variances of individual-level characteristics (such as health, marital, and employment experiences aggregated from the survey to characterize the environment surrounding individuals – for a description see Bryk & Raudenbush, 1992).

(5) Improvement of gender-sensitive measurement of alcohol consumption and alcohol-related problems. In preparation for the GENACIS project, members of the International Research Group on Gender and Alcohol (IRGGA) have developed a set of core questions about alcohol consumption and alcohol-related problems to be used in the surveys participating in the global project. Countries can also include alternative questions or measurement procedures in addition to the new core questions, allowing comparisons of gender-specific data obtained by different procedures. Comparisons of the results from the core questions and alternative measurements will reveal whether there are ways that surveys in various countries can make significant improvements in their coverage of women's and men's drinking behavior.

This set of core GENACIS questions can be found in Appendix 1 and were used for all new surveys in the present study.

Methods

Two different main methods were used for the two different years presented in this study. The first set will describe the overall method of the PAHO multicentric study with indications where different countries adapted these methods or instruments to better suit their individual needs. Also, please note that each indicator used in estimating alcohol-related burden of disease was also measured in the survey, so general discussions of alcohol consumption indicators are applicable to alcohol generally, not only alcohol related burden of disease studies. The second part of the methods section will describe in detail the methods used to determine per capita consumption estimates and corresponding alcohol-attributable burden of disease in the region of the Americas.

PAHO Multicentric Study

The data presented in this report involved a 10-country survey whose main objectives were to provide a detailed epidemiological picture of alcohol consumption and alcohol-related outcomes. It has an overall method that is included in the research proposal summarized below, but certain deviations from this method were dealt with on a by-country basis. All countries were required to use at least the GENACIS core questionnaire (see Appendix 1) but could use questions from the Expanded Core if desired. For a copy of the exact survey that each country used, please contact individual study supervisors (Appendix 2).

Main study requirements

(1) A sample size of at least 1,000.
(2) Inclusion of both adult women and adult men (age 18 and older) proportional to their representation in the general population of the study area.
(3) Full probability sampling at all levels and strata.
(4) A national sample, whenever possible; otherwise a representative or well characterized geographic area or areas.
(5) Approval of the research proposal by an appropriate Ethics Committee in the country.

Survey Methods

(1) Strenuous efforts to attain a 70% or higher completion rate.
(2) Inclusion of all questions from the GENACIS Expanded Core Questionnaire, with the exception of any questions judged by the country survey leader and staff to be culturally inappropriate for their country.
(3) Inclusion of a core set of behavioural outcomes (intentional/unintentional injuries, CHD, violence).
(4) It is strongly encouraged that each country's survey director consults with the group or data analysis coordinator about their sampling plan.
(5) Guidelines for interviewers and project staff will address confidentiality Issues, special training needs for the administration of potentially sensitive questions, awareness of both respondent and interviewer

reactions to sensitive questions, and identification of local resources available to respondents who may need physical or mental health services.

The following is a list and brief description of the participating countries with data presented in this report and were provided by the country investigators for this report:

Argentina
Survey Leader: Dr. Myriam Munné, Research Institute of University of Buenos Aires Year of Survey: 2002. Type of survey: cross sectional, probability sample, of the province and city of Buenos Aires, representing 50% of the country's population. Sample: 1,000 males and females, aged 18-65 years old. Face-to-face interviews were conducted using the GENACIS questionnaire.

Belize
Survey Leader: Dr. Claudina E. Cayetano, Ministry of Health, Belize. Sample Size: 2400 men and women 18+. The sample was drawn from the nationally representative Labour Force Survey.

A sample of the households representing urban and rural areas was selected from each district. Each of the six administrative districts is sub-divided into smaller Enumeration Districts (EDs) that have an average size of 200 households. Each administrative district was treated as a stratum. The sample comprised a two-stage design with selection of urban and rural EDs as the first stage. The second stage is the systematic random selection of households from within selected EDs. A total of 120 EDs were sampled and 20 households randomly selected from each, which yielded a sample size of 2,400 households.

The survey was administered to household[1] members, both male and female, 18 years and older, using an expanded version of the GENACIS questionnaire. As this was a national survey, questionnaires were prepared in both English and Spanish. A face to face interview was conducted with each of the eligible household member. When an eligible member was not available, arrangements were made to meet with that person to conduct the interview at a later date. The interviews were conducted during a three-week period by trained interviewers. The District Supervisors of the Central statistical Office, (CSO), were responsible for the overall supervision of the fieldwork in their respective district with the assistance of field supervisors. Completed questionnaires were edited at the district level, while the data entry and processing were conducted at CSO headquarters using CSPro for data entry and SPSS for analysis.

Brazil (I)
Survey Leaders: Dr. Florence Kerr-Corrêa, São Paulo State University, Dr. Maria Cristina Lima and Dr. Adriana M. Tucci. Year 2005-2006. A stratified sample, representative of socio-

[1]One or more person (related or unrelated) living together, i.e. sleeping most nights of a week (at least 4 nights per week) and sharing at least one daily meal.

economic and educational levels, was drawn from Great São Paulo (39 municipalities and approximately 19,037,000 inhabitants) and included those aged more than 18 years.

Sample size was calculated and the following age ranges were established for both genders: 18 to 34 years, 35 to 59, and 60 years or over. Each stratum was composed from the sector census[1] and respondents were selected using cluster-sampling schemes. The sampling unit was family households, including condominiums and single dwellings; student housing and institutional and commercial buildings were not included. All people in the household sample who were over 18 years old could be interviewed. The sample size was increased to allow for a possible non-response rate of 20%. The final sample was of 2083 respondents and the response rate was of 75%. Funding provided by FAPESP (04/11729-2).

Brazil (II)

Survey Leader: Dr. Ronaldo Laranjeira, Federal University of São Paulo Year 2006-2007. A representative probability sample of the Brazilian population aged 14 years or older was used. All metropolitan regions and capitals of each state were accounted for in a 3-stage sampling strategy based on municipal sectors, census tracts, and finally individuals. The sampling strategy was based on the Brazilian 2000 Census. With a response rate of 66.4%, a total of 3700 interviews were completed in 2006-2007. Post-stratification weights were calculated to adjust the sample to known Census population distributions of sociodemographic variables and thus is representative of the Brazilian population aged 14 years or older. Support provided by the National Secretary on Drugs (SENAD). International consultant to the project: Dr. Raul Caetano.

Canada

Survey Leader: Dr. Kathryn Graham., Centre for Addiction and Mental Health (CAMH), Toronto/London, Ontario, WHO and PAHO Collaborating Centre.
Name of survey: Gender, alcohol and problems in Canada. Year of survey: 2004. Type of survey: random sampling of the general population in Canada. Mode of data collection: random digit dialling (RDD) Computer Assisted Telephone Interview (CATI) survey. Sample size: 14,000. Age range and sex: males and females 18-75 years of age.

Costa Rica

Survey Leader: Dr. Juliano Bejarano, San Jose, Instituto de Alcoholismo y Farmacodependencia. The study had been carried out by the Fundación Vida y Sociedad of Costa Rica. Year: 2003. The sample was drawn from the Great Metropolintan Area, a geographical area that contains almost one half of national population and 50% of households. The design of the study was a household survey restricted to the Great Metropolitan Area population. It was a multistage cluster sample design with proportional size probability and included males and females aged 18 and older, living permanently or temporarily in houses. The primary sampling unit was the segment (geographical area with an arbitrary delimitation: i.e. streets, houses, rivers, including approximately 70 households), which was selected by proportional size probability, based on the number of existing households in it. The second sampling stage is the household, which was selected systematically from an initial

random starting. For each segment the interviewer had a detailed cartography to select the starting dwelling and the direction to follow. The final sample stage was the subject in each household. The subjects were selected randomly using a route sheet. Sample size was 1274 respondents (630 men and 644 women). 82% were from urban zones, 18% from rural areas. In urban areas 51.6% were men and 48.4% women, while in rural areas 39.7% were men and 60.3% women. Eight experienced and trained advanced psychology students conducted each face-to-face interview. They administered the standardized 30-45 minute GENACIS interview. Respondents were informed that they could refuse to answer any of the items of the questionnaire that they did not want. Fieldworkers were also prepared to attend special situations regarding with respondent's feelings evoked by some sensitive questions (sexuality, victimization, alcohol consumption, etc.). Sample design did not include homeless people, patients in hospitals or those without established residence.

Mexico

Survey Leaders: Dr. Martha Romero and Dr. Maria Elena Medina Mora, National Institute of Psychiatry "Ramón de la Fuente Muñiz", Mexico City, PAHO/WHO Collaborating Centre.
Survey Year: 1998. Type of survey: national household survey (urban cities with more than 25,000 habitants and cities on the border of the USA). Mode of data collection: face-to-face interviews. Sample size: 9,600 men and women. Age range: 12 to 65 years. The sampling frame used the data and boundary maps from the 1995 Population Count, including the basic geostatistical areas (similar to the US census tracks), which are the smallest geographically defined units for which data on population are available. A geographically stratified multistage sample design (localities, city blocks, housing unit segments within the selected blocks, all households within the selected segments, and one individual within the selected households) was used. The sample size took into account an expected non response rate of 16%, a prevalence rate of 1% for any type of substance use and a precision level of 3% for estimates of rates under 25% or above 75% with a 95% confidence level, and assuming a value of 1.5 for the Design Effect (DEFF) due to the clustering of the sample design, based on data from recent surveys. For each household in the sample, a small household questionnaire was applied to obtain the living conditions of the dwelling as well as a listing with the basic socioeconomic data for all household members. Using this questionnaire two independent list of household members within the predetermined age ranges (12 to 17 and 18 to 65 years of age) was produced, excluding servants living in the household as well as those persons not speaking Spanish or mentally disabled to answer the questionnaire. Adolescents within each household were randomly selected using a balanced random number table. Adults (18 to 65 years of age) were selected with an equal probability. Sampling weights were determined according to the probability of selection within each stage, and adjusted to take into account corrections for differences in non-response rates among males and females. The information was gathered through a standardized questionnaire, extensively tested in previous surveys answered in a face-to-face interview, it includes items drawn from the US household surveys in order to enable cross-cultural comparisons of data.

Nicaragua

Survey Leader: Dr José T A Caldera, Professor at University of Colonia, León, Nicaragua. Sample Size: 2030 men and women aged 18-65. Five representatives cities were chosen from four cardinals points (Leon, Rivas, Estelí y Juigalpa) and one from Atlantic coast (Bluefields); all of them with more than 60.000 inhabitants. For each one 200 hectares were selected by random from digital map. The sample size was 400 interviews with 95% confidence and 5% of precision.

Peru

Survey Leader: Dr. Maria Piazza, Coordinator of the area of Information and Epidemiology, Drug Prevention Program and Dependence Rehabilitation of the National Commission for Life and Development without Drugs (DEVIDA- Comisión Nacional para el Desarrollo y Vida sin Drogas) and Belgium Technical Cooperation (CTB).
Sample size: 1110 persons from the capital (Lima) aged 18-64 years of age (representing 30% of the general population) and 421 persons from Ayacucho, in the Andean region of the country, through face to face interviews using a multiple stage probability sample. The sampling frame used the data and boundary maps from the 1996 Population Count, including the basic areas similar to the US census tracks, which are the smallest geographically-defined units for which data on population are available. The sampling stages involve sampling "conglomerados" (similar to census tracks each with a total of about 40 homes distributed in one or several blocks), a second stage involved sampling homes, and finally persons within each home. For Lima the sampling size was estimated in 1,152 residents of homes located in 144 "conglomerados". In Ayacucho a total of 480 residents living in homes located in 50 "conglomerados" were selected.

Uruguay

Survey Leader: Dr. Raquel Magri, National Secretary on Drugs, Montevideo.
Year: 2004. Type of survey: cross sectional, household survey. Sample: probabilistic sample, representative of the general population from all cities with 10,000 or more habitants in the country. Sample size: 1,000, males and females. Age range: 18-65 years.

USA

Survey Leader: Dr. Thomas K. Greenfield, Alcohol Research Group (ARG), Public Health Institute, Berkeley, California. Funded by Center Grant P50 AA05595 from the US national Institute on Alcohol Abuse and Alcoholism (NIAAA). The 2000 US National Alcohol Survey (N10) was conducted for ARG by Temple University Institute of Survey Research with interviews between November 1999 and June 2001. N10 involved a national household survey using Computer Assisted Telephone Interviewing (CATI) of adults (18 or older) residing in all 50 US states and Washington DC (n = 7,612), based on Random Digit Dialling (RDD) sampling with list-assisted number generation, automatic detection of nonworking numbers, and computer matching against yellow pages to increase the hit rate. The sample included a total of 4142 women and 3470 men. Analyses typically use weighting for national representativeness based on the 2000 Census, also adjusting standard errors to account for the sampling design (e.g., stratification, non-response, adults in the household and independent telephone numbers) using statistical programs such as Stata.

Regional profile: 2002

The following key indicators of exposure are involved in estimating alcohol related burden of disease (Rehm et al. 2004):

- Adult per capita consumption of recorded alcohol
- Adult per capita consumption of unrecorded alcohol
- Prevalence of abstention by age and sex
- Prevalence of different categories of average volume of alcohol consumption by age and sex
- Score for patterns of drinking

Per capita consumption

Per capita data on alcohol consumption denote the consumption in litres of pure alcohol per inhabitant in a given year. These data are available for the majority of countries, often in time series, and tend to avoid the underestimation of total volume of consumption commonly seen in survey data (e.g. Midanik, 1982; Rehm, 1998; Gmel & Rehm, 2004). Adult per capita consumption, i.e. consumption by everyone aged 15 and above, is regarded as preferable to per capita consumption per se as the overwhelming portion of alcohol is consumed in late adolescence and adulthood. The age pyramid varies in different countries (United Nations 2005), therefore per capita consumption figures based on the total population tend to relatively underestimate consumption in countries where the larger proportion of the population is below age 15, as is the case in many developing countries. For more information and guidance on estimating per capita consumption see the "International Guide for Monitoring Alcohol Consumption and Related Harm" (WHO 2000).

There are three principal sources of data for per capita estimates: national government data, data from the Food and Agriculture Organization of the United Nations (FAO) and from the alcohol industry (Rehm et al., 2003b). Where available, the best and most reliable data generally stem from national governments, usually based on sales figures, tax revenue, and/or production data. Generally, sales data are considered the most accurate, provided that sales of alcoholic beverages are separated from sales of any other possible items sold at a given location, and that sales data are beverage specific. One of the drawbacks of production data is that they are always dependent on accurate export and import data, otherwise the production figures will yield an under- or an overestimation.

The most complete and comprehensive international dataset on per capita consumption is published by FAO. FAOSTAT, the database of the FAO, publishes production and trade data for almost 200 countries for different types of alcoholic beverages. The estimates are based on official reports of production by national

governments, mainly as replies by the Ministries of Agriculture to an annual FAO questionnaire. The statistics on import and export derive mainly from Customs Departments. If these sources are not available, other government data such as statistical yearbooks are consulted. The accuracy of the FAO data relies on member nations reporting the data. It is likely that the data underestimate informal, home and illegal production (Giesbrecht et al, 2000).

The third main source of data comes from the alcohol industry. In this category the most widely used source is World Drink Trends (WDT), first published by the Commission for Distilled Spirits (World Advertising Research Center 2005). The WDT estimates are based on total sales in litres divided by the total mid-year population and use conversion rates that are not published. WDT also tries to calculate the consumption of both incoming and outgoing tourists. Currently, at least partial data are available for 58 countries. There are other alcohol industry sources, as well as market research companies that are less systematic, contain fewer countries, and are more limited in time scope.

The WHO Global Alcohol Database (GAD) (www.who.int/whosis) systematically collects and compares per capita data from different sources on a regular basis (for procedures and further information see WHO 1999; 2004; Rehm et al. 2003b) using UN data for population estimates. The following rules to select the best data for each country have been used:

- For all countries that are "high income" in the World Bank classification, and where there were WDT estimates, these estimates should be taken[2], as they are based on country specific sales data.
- For all other countries where the WDT has used national government statistics, domestic alcohol industry statistics, or supplemented FAO information with additional local sources, WDT estimates should be used.
- For other countries, FAO estimates should be used.
- Both FAO and WDT should be replaced, if there were govern ment estimates based on written documentation and including sales data for several years.

The use of government statistics as per capita estimates in the GAD has to be approved by the steering committee of GAD. Currently, there are government statistics

[2] *List of countries classified as "high income" according to World Bank: Andorra, Aruba, Australia, Austria, Bahamas, Bahrain, Belgium, Bermuda, Brunei Darussalam, Canada, Cayman Islands, Channel Islands, Cyprus, Denmark, Faeroe Islands, Finland, France, French Polynesia, Germany, Greece, Greenland, Guam, Iceland, Ireland, Israel, Italy, Japan, Kuwait, Liechtenstein, Luxembourg, Monaco, Netherlands, Netherlands Antilles, New Caledonia, New Zealand, Northern Mariana Islands, Norway, Portugal, Qatar, Republic of Korea, San Marino, Singapore, Slovenia, Spain, Sweden, Switze land, United Arab Emirates, United Kingdom, United States of America, United States Virgin Islands.*

only for a very small minority of countries. The above specified decision tree assumes the following hierarchy of validity and reliability of data (from most valid/reliable to least valid/reliable):

1. Government statistics based on sales and taxation data
2. Alcohol industry statistics with country specific information on sales
3. FAO
4. Alcohol industry statistics from global sources (this option only to be used when no FAO data exist for the country)

In practice, the algorithm means that many of the developed country estimates are based on either WDT or direct government data, while most estimates for the developing countries are based on FAO data. For countries with both estimates available, sources correlate to a considerable degree (Pearson correlation = 0.74; Rehm et al. 2003a); but it does not seem possible to find an overall explanation for the systematic differences in the data for all countries. Obviously one explanation is that the FAO estimates are based on production data, while WDT is primarily based on sales data. This may lead to FAO estimates being higher, as FAO partly reflects production of beverages that do not show up in sales data either because of so-called home production, e.g. the production of palm wine or sorghum beer in some African countries, or because WDT does not account for the whole range of beverage categories.

For the ongoing efforts of the most recent CRA-type estimate of alcohol-attributable burden of disease for the year 2002, the year with the latest available data on burden of disease in different parts of the world (Mathers et al. 2003), we used an average of the adult per capita information of three years 2001, 2002 and 2003 to get a more stable country estimate.

Unrecorded consumption

Unrecorded consumption stems from a variety of sources (Giesbrecht et al. 2000):

- Home production of alcoholic beverages
- Illegal production and sale of alcoholic beverages
- Illegal and legal import of alcoholic beverages
- Other production and use of alcoholic beverages, not taxed and/or part of the official production and sales statistics.

For the current efforts of estimated alcohol-attributable burden of disease for year 2002, we took the country data on unrecorded consumption from the GAD. For countries, where no estimate of unrecorded consumption existed, and where there was World Health Survey (WHS) or other large representative survey indicating more consumption than the recorded consumption, we estimated unrecord-

ed consumption from these surveys. Obviously, however, a major purpose of the GENACIS surveys is to investigate total alcohol consumption (both recorded and unrecorded) systematically through surveys.

Prevalence Categories

Prevalence of different categories of average volume of alcohol consumption by age and sex was also assessed by survey—essentially tapping the concentration of the drinking distribution in these demographic subgroups (Greenfield & Rogers, 1999). The same criteria for survey selection as specified above applied. The categories of drinking as defined in Table 1 were used, constructed in a way that the risk of many chronic diseases such as alcohol-related cancers were about the same for both men and women in the same category, e.g. (Rehm et al. 2003c; 2004). These categories were first used as the basis to derive attributable fractions in the first Australian study on the costs of substance abuse (National Health and Medical Research Council 1992; English et al. 1995) and have been used in many epidemiological and cost of illness studies, and in the data presented in this report.

Table 1: Definition of drinking categories

Drinking categories	Men	Women
Abstainer or very light drinker	0 -< 0.25 g/day	0 -< 0.25g/day
Drinking category I	0.25 - < 40g/day	0.25-< 20g/day
Drinking category II	40 - < 60g/day	20 - < 40g/day
Drinking category III	60+ g/day	40+ g/day

Note: the limits of these categories are stated in grams of pure alcohol per day. For reference, a bottle of table wine contains about 70 grams of ethanol; 0.25 g/day corresponds to somewhat less than one glass of wine per month.

Patterns of drinking

Patterns of drinking impact certain disease categories such as ischaemic heart disease or injuries independently of volume consumed (Greenfield 2001; Rehm et al. 2003c; 2004; 2006b). To quantify the impact of patterns of drinking, a score has been constructed and validated for the CRA of the year 2000 (Rehm et al. 2001; 2003b; 2004). The score and its underlying algorithms have been described in detail elsewhere (Rehm et al. 2003b, 2004). It comprises four different aspects of heavy drinking (high usual quantity of alcohol per occasion; frequency of festive drinking at fiestas or community celebrations; proportion of drinking occasions when drinkers get drunk; distribution of the same amount of drinking over fewer rather than many occasions), no drinking with meals and drinking in public places. Those aspects were found to be loading on one underlying dimension in an optimal scaling analysis (Bijleveld et al. 1998). In several analyses with different methodology, they have been found related to ischaemic heart disease (Gmel et al. 2003; Rehm et al. 2004) and to different forms of injury (Cherpitel et al. 2005; Rehm et al; 2004).

Patterns scores have been assessed by a mixed methodology of key expert interviews and surveys. They are part of the GAD, and currently only one score per country has been calculated. The GENACIS survey uses this same methodology to create drinking patterns based on survey data assessing the four different aspects, aggregated to the country or area level.

Data indicating burden of disease

Both event-based and time-based measures indicating population health status were used in the present analyses. Mortality, as measured in number of deaths, was the event measure; years of life lost due to premature mortality (YLL) and burden of disease, as measured in disability adjusted life years (DALYs), constituted the time-based gap measures (Murray et al. 2002; Rehm et al; 2004). The DALY measure combines YLL with years of life lost to living with a disability. Estimates for mortality and DALYs for the years 2002 and 2005 were directly obtained by WHO Headquarters (Dr. C. Mathers). YLL and DALYs were 3% age-discounted and age-weighted to be comparable with the Global Burden of Disease (GBD) study. Population data were obtained from United Nations (UN) population division (United Nations 2005). Age groups used were: 0-4 years, 5-14 years, 15-29 years, 30-44 years, 45-59 years, 60-69 years, and 70+ years.

Relating alcohol exposure to disease and injury outcomes

Alcohol consumption was found to be related to the following GBD categories (for GBD categories: Mathers et al. 2001; for the relationship to alcohol: Rehm et al; 2003c; 2004; Clinical Trials Research et al. 2002): conditions arising during the perinatal period: low birthweight; cancers: mouth and oropharynx cancers, oesophageal cancer, colon and rectal cancers, liver cancer, breast cancer and other neoplasms; diabetes mellitus; neuropsychiatric conditions: alcohol use disorders, epilepsy; cardiovascular diseases: hypertensive heart disease, ischaemic heart disease, cerebrovascular diseases: haemorrhagic stroke, ischaemic stroke; cirrhosis of the liver; unintentional injuries: road traffic accidents, poisonings, falls, drownings, and other unintentional injuries; intentional injuries: self-inflicted injuries, violence and other intentional injuries.

These disease categories are the same as for the CRA 2000 with one exception: colorectal cancer has been added. In other words, all of the major review studies in the 1990s and the beginning 2000s concluded a causal relationship between alcohol and the respective disease or injury category selected (Rehm et al. 2003c), except for colorectal cancer, where some of the evidence is newer (Boffetta et al., 2006; Cho et al., 2004).

Risk relations

Table 2 gives an overview on relative risks (RR) for different diseases by drinking categories.

Table 2: Prevalence of abstainers and drinking categories in participating countries among men and women.

Disease condition	ICD-10	GBD code	Drinking category I RR	Drinking category II RR	Drinking category III RR	Sources and comments
Conditions arising during the perinatal period: Low birthweight	P05-P07	U050	M/W 1.00	M/W 1.40	M/W 1.40	(Gutjahr et al. 2001; Rehm et al; 2004)
Mouth and oropharynx cancers	C00-C14	U061	M/W 1.45	M/W 1.85	M/W 5.39	(Gutjahr et al. 2001)
Esophageal cancer	C15	U062	M/W 1.80	M/W 2.38	M/W 4.36	(Gutjahr et al. 2001)
Colon and rectal cancers	C18-C21	U064	M/W 1.00	M 1.16 W 1.01	M 1.41 W 1.41	(Cho et al. 2004)
Liver cancer	C22	U065	M/W 1.45	M/W 3.03	M/W 3.60	(Gutjahr et al. 2001)
Breast cancer	C50	U069	<45 yrs W 1.15 45+ yrs W 1.14	<45 yrs W 1.41 45+ yrs W 1.38	<45 yrs W 1.46 45+ yrs W 1.62	(Ridolfo et al. 2001)
Other neoplasms	D00-D48	U078	M/W 1.10	M/W 1.30	M/W 1.70	(Rehm et al. 2004)
Diabetes mellitus (A regions)	E10-E14	U079	M 0.99 W 0.92	M 0.57 W 0.87	M 0.73 W 1.13	(Gutjahr et al. 2001)
Diabetes mellitus (Non-A regions)	E10-E14	U079	M/W 1.00	M/W 1.0	M 1.00 W 1.13	(Gutjahr et al. 2001)
Alcohol use disorders	F10	U086	-	-	-	AF 100%
Unipolar depressive disorders*	F32-F33	U082				(Rehm et al; 2004)
Epilepsy	G40, G41	U085	M 1.23 W 1.34	M 7.52 W 7.22	M 6.83 W 7.52	(Gutjahr et al. 2001)
Hypertensive heart disease	I10-I14	U106	M 1.33 W 1.15	M 2.04 W 1.53	M 2.91 W 2.19	(Corrao et al. 1999)
Ischaemic heart disease*	I20-I25	U107	M/W 0.82	M/W 0.83	M 1.00 W 1.12	(Corrao et al. 2000); (Rehm et al; 2004)
Haemorrhagic stroke (A regions)	I60-I62	U108	M 1.12 W 0.74	M 1.40 W 1.04	M 1.54 W 1.94	(Reynolds et al. 2003)
Haemorrhagic stroke (Non-A regions)	I60-I62	U108	M 1.12 W 1.00	M 1.40 W 1.04	M 1.54 W 1.94	(Reynolds et al. 2003)
Ischaemic stroke (A regions)	I63	U108	M 0.94 W 0.66	M 1.13 W 0.84	M 1.19 W 1.53	(Reynolds et al. 2003)
Ischaemic stroke (Non-A regions)	I63	U108	M/W 1.00	M 1.13 W 1.00	M 1.19 W 1.53	(Reynolds et al. 2003)
Cirrhosis of the liver*	K74	U117	M/W 1.26	M/W 9.54	M/W 13.0	(Rehm et al; 2004)
Road traffic accidents*	&	U150	For all injury categories (shaded areas), the approach assuming that consumption strata specific RRs are generalisable across countries was only used as a sensitivity analysis. The main analyses used region-specific alcohol-attributable fractions, based on both the level of consumption and drinking pattern (for derivation see Rehm et al., 2004).			(Rehm et al; 2004)
Poisonings*	X40-X49	U151				(Rehm et al; 2004)
Falls*	W00-W19	U152				(Rehm et al; 2004)
Drownings*	W65-W74	U154				(Rehm et al; 2004)
Other unintentional injuries*	Rest of V, W20-W64, W75-W99, X10-X39, X50-X59, Y40-Y86, Y88, Y89	U155				(Rehm et al; 2004)
Self-inflicted injuries*	X60-X84, Y870	U157				(Rehm et al; 2004)
Violence*	X85-Y09, Y871	U158				(Rehm et al; 2004)
Other intentional injuries*	Y35	U160				(Rehm et al; 2004)

RR – relative risk

* AAFs are taken from CRA for non-A regions (based on pooled cross-sectional time-series analyses)

&V01-V04, V06, V09-V80, V87, V89, V99. For countries with four-digit ICD-10 data, use: V01.1-V01.9, V02.1-V02.9, V03.1-V03.9, V04.1-V04.9, V06.1-V06.9, V09.2, V09.3, V10.4-V10.9, V11.4-V11.9, V12.3-V12.9, V13.3-V13.9, V14.3-V14.9, V15.4-V15.9, V16.4-V16.9, V17.4-V17.9, V18.4-V18.9, V19.4-V19.6, V20.3-V20.9, V21.3-V21.9, V22.3-V22.9, V23.3-V23.9, V24.3-V24.9, V25.3-V25.9, V26.3-V26.9, V27.3-V27.9, V28.3-V28.9, V29.4-V29.9, V30.4.V30.9, V31.4-V31.9, V32.4-V32.9, V33.4-V33.9, V34.4-V34.9, V35.4-V35.9, V36.4-V36.9, V37.4-V37.9, V38.4-V38.9, V39.4-V39.9, V40.4-V40.9, V41.4-V41.9, V42.4-V42.9, V43.4-V43.9, V44.4-V44.9, V45.4-V45.9, V46.4-V46.9, V47.4-V47.9, V48.4-V48.9, V49.4-V49.9, V50.4-V50.9, V51.4-V51.9, V52.4-V52.9, V53.4-V53.9, V54.4-V54.9, V55.4-V55.9, V56.4-V56.9, V57.4-V57.9, V58.4-V58.9, V59.4-V59.9, V60.4-V60.9, V61.4-V61.9, V62.4-V62.9, V63.4-V63.9, V64.4-V64.9, V65.4-V65.9, V66.4-V66.9, V67.4-V67.9, V68.4-V68.9, V69.4-V69.9, V70.4-V70.9, V71.4-V71.9, V72.4-V72.9, V73.4-V73.9, V74.4-V74.9, V75.4-V75.9, V76.4-V76.9, V77.4-V77.9, V78.4-V78.9, V79.4-V79.9, V80.3-V80.5, V81.1, V82.1, V83.0-V83.3, V84.0-V84.3, V85.0-V85.3, V86.0-V86.3, V87.0-V87.8, V89.2, V89.9, V99, Y850.

For most chronic disease categories, alcohol-attributable fractions (AAFs) of disease were derived from combining prevalence of exposure and relative risk estimates based on meta-analyses (Cho et al. 2004; Corrao et al. 2000; English et al. 1995; Gutjahr et al. 2001; Rehm et al. 2004; Ridolfo et al. 2001); using the following formula (Walter1976; Walter1980):

$$AF = [\sum_{i=1}^{k} P_i(RR_i - 1)]/[\sum_{i=0}^{k} P_i(RR_i - 1) + 1]$$

Where

i: exposure category with baseline exposure or no exposure i=0
RR(i): relative risk at exposure level i compared to no consumption
P(i): prevalence of the ith category of exposure

AAFs, as derived from the formula above can be interpreted as reflecting the proportion of disease that would disappear if there had been no alcohol consumption.

For depression and injuries, AAFs were taken from Comparative Risk Analysis (CRA) study (see Rehm et al; 2004, for a detailed description of underlying assumptions and calculations). Protective effects of alcohol consumption on ischaemic heart disease, strokes and diabetes were not estimated in all non-A regions due to the evidence that the pattern of drinking for most alcohol consumption is not protective in these regions (for physiological mechanisms: McKee & Britton 1998; Puddey et al. 1999; Rehm et al. 2003d; for epidemiological evidence: Gmel et al. 2003; Rehm et al. 2004; in press). Thus, where in A regions a relative risk of less than 1 would represent the protective effect for strokes and diabetes; in non-A regions a relative risk of 1 was used. For ischaemic heart disease, the results of a pooled cross-sectional time-series analysis were used (Rehm et al., 2004). Sensitivity analyses with assumptions of full protective effects will complete the final report.

To estimate stroke subtypes (ischaemic stroke and hemorrhagic stroke), we used the region and age-specific proportions of stroke subtypes so that weighted RRs could be applied (CTR, 2002).

Results

COUNTRY profiles: 2005

With respect to country-level alcohol consumption, there was wide variation within and between countries, even among those in the same sub region. Table 3 and 4 show summaries of two different alcohol consumption variables in participating countries. From Table 3, we can see that, overall, most men and women were classified as abstainers or moderate drinkers. Generally also, as drinking categories increase, prevalence levels decrease overall among both men and women. However, there were country-specific gender differences seen in the exposures of men and women. In all countries except Canada and Peru, the majority of women were abstainers. The overall data report abstinence rates from a high of approximately 90% in Nicaragua to a low of 27% in Canada. Among men, the majority were category I drinkers, except in Nicaragua and Belize, where approximately half the male survey population were abstainers in each country, with only 35% and 39% found in category I, respectively. With respect to hazardous and harmful drinking, Brazil II (National sample) reported the highest prevalence of harmful drinking at a full quarter of the population (25.8%), and the lowest in Peru (1.3%). Among women, Brazilian women from the national survey (Brazil II) reported the highest prevalence at 11.8%, approximately 10 times higher than the next country (Canada at 1.30%). The lowest reported proportion of harmful drinking was found in Costa Rica (0.09%) and Peru (0.1%).

The prevalence of Category III drinking among men in Belize, Brazil I, Brazil II and Nicaragua outnumbered their countrymen in Category II by a ratio of 2:1. Interestingly, in these three countries the rates of abstinence are also very high (ranked top 5). Among women, Nicaragua, Belize, and particularly Brazil had the highest prevalences of abstainers among women (Brazil less so), yet were also among the top ranked countries with respect to the most harmful drinking categories (category II and III) among all women, especially in Brazil, where women reported very high levels of both hazardous and harmful drinking compared to the other 9 surveys. Canada, however, has relatively high prevalences in all 3 drinking categories and low abstinence for men and women. In this country, although the prevalence of moderate drinking is very high, the prevalence of hazardous and harmful drinking was also very high in comparison to the other countries, and much higher than the numbers reported by the USA survey, even though these countries are classified in the same sub region (AMR A).

Table 3: Prevalence of abstainers and drinking categories in participating countries among men and women.

	Age Group	Abstainer <= 0.25 g/d		Cat 1 M: 0-40 g/d W: 0-20 g/d		Cat 2 M: 40-60 g/d W: 20-40 g/d		Cat 3 M: 60+ g/d W: 40+ g/d	
		M†	W†	M	W	M	W	M	W
Argentina	18-29	10.79	50.53	83.35	48.46	3.75	1.01	2.10	0
	30-44	13.73	61.67	70.71	36.78	6.81	1.51	8.74	0.04
	45-59	12.42	53.34	75.51	43.39	10.58	1.24	1.50	2.03
	60-69	19.59	51.95	68.43	47.69	7.31	0.36	4.67	0
	Overall	12.80	55.06	76.59	43.12	6.56	1.20	4.05	0.63
Belize	18-29	45.88	77.82	44.29	19.38	3.52	2.25	6.31	0.55
	30-44	44.05	77.97	41.90	19.56	5.17	1.53	8.88	0.94
	45-59	51.24	84.15	37.93	13.89	2.27	0.98	8.56	0.99
	60-69	58.61	92.77	30.63	7.23	4.13	0	6.63	0
	70-79	73.85	97.72	25.36	2.28	0	0	0.79	0
	80+	89.76	93.86	10.24	6.14	0	0	0	0
	Overall	49.63	81.28	39.52	16.56	3.60	1.46	7.26	0.7
Brazil (I)	18-29	39.61	66.70	50.51	31.63	4.41	1.50	5.48	0.17
	30-44	33.01	76.13	57.86	22.79	3.42	0.53	5.71	0.56
	45-59	47.43	78.73	45.64	20.16	2.70	1.11	4.23	0
	60-69	57.76	86.09	36.39	12.90	2.50	1.02	3.34	0
	70-79	73.95	95.31	23.35	4.69	0	0	2.71	0
	80+	95.79	95.53	4.21	4.47	0	0	0	0
	Overall	42.71	76.13	49.05	22.69	3.31	0.69	4.93	0.24
Brazil (II)	18-29	27.12	41.86	30.40	20.02	11.76	18.86	30.71	19.25
	30-44	29.38	52.42	32.04	17.44	5.93	18.01	32.65	12.13
	45-59	34.82	64.12	41.25	17.59	8.17	11.55	15.77	6.75
	60-69	38.67	74.28	41.85	10.20	3.09	11.04	16.40	4.48
	70-79	56.89	78.08	30.75	15.10	3.20	5.31	9.16	1.51
	80+	79.15	95.38	17.13	4.62	0	0	3.72	0
	Overall	32.01	55.50	34.13	17.31	8.01	15.39	25.84	11.79
Canada	18-29	12.83	20.11	75.81	70.75	4.50	6.83	6.86	2.32
	30-44	14.58	22.69	78.70	71.41	4.14	4.75	2.58	1.14
	45-59	21.76	26.00	71.29	68.04	4.21	4.70	2.74	1.27
	60-69	24.90	36.34	66.35	58.69	5.79	4.37	2.96	0.60
	70-79	38.55	48.66	54.30	47.22	5.18	3.13	1.96	0.98
	Overall	18.93	26.82	73.12	66.95	4.49	4.92	3.47	1.30

	Age Group	Abstainer <= 0.25 g/d		Cat 1 M: 0-40 g/d W: 0-20 g/d		Cat 2 M: 40-60 g/d W: 20-40 g/d		Cat 3 M: 60+ g/d W: 40+ g/d	
		M†	W†	M	W	M	W	M	W
Costa Rica	18-29	28.71	61.41	63.69	36.31	5.05	2.00	2.54	0.29
	30-44	49.75	70.16	47.67	27.74	0.51	2.10	2.06	0
	45-59	48.78	72.93	49.35	26.63	1.87	0.44	0	0
	60-69	60.16	92.00	36.51	8.00	0	0	3.33	0
	70-79	56.59	88.89	39.01	11.11	4.4	0	0	0
	80+	50.00	77.51	50.00	22.49	0	0	0	0
	Overall	43.59	70.17	52.17	28.28	2.48	1.45	1.75	0.09
Mexico	18-29	29.32	76.01	66.06	22.87	2.26	0.89	2.66	0.23
	30-44	24.51	74.15	70.53	24.65	2.34	0.52	2.63	0.68
	45-59	32.92	76.04	60.83	23.39	1.87	0.51	4.37	0.15
	60-69	46.87	84.91	49.69	14.38	0.97	0	2.46	0.71
	Overall	29.00	75.66	65.87	23.29	2.15	0.64	2.98	0.41
Nicaragua	18-29	47.37	86.88	42.51	11.24	2.43	0.51	7.69	1.36
	30-44	57.75	89.61	37.43	9.80	2.14	0.20	2.67	0.39
	45-59	63.70	93.83	27.41	5.76	5.19	0.41	3.70	0
	60-69	86.67	95.52	13.33	4.48	0	0	0	0
	70-79	88.89	100.0	11.11	0	0	0	0	0
	80+	66.67	--	33.33	--	0	--	0	--
	Overall	56.84	89.55	35.67	9.39	2.77	0.35	4.72	0.71
Peru	18-29	16.22	43.06	80.74	56.60	0.72	0.34	2.32	0
	30-44	15.19	44.65	84.06	55.33	0.71	0.02	0.04	0
	45-59	22.52	45.89	76.17	53.24	0	0.47	1.32	0.4
	60-69	44.18	48.55	55.82	51.45	0	0	0	0
	Overall	19.78	44.70	78.60	54.96	0.51	0.23	1.12	0.1
Uruguay	18-29	15.83	45.45	73.33	47.27	6.67	5.45	4.17	1.82
	30-44	25.66	56.82	68.14	42.05	3.54	1.14	2.65	0
	45-59	30.48	64.53	60.95	33.99	2.86	0.99	5.71	0.49
	60-69	42.11	68.75	55.26	28.75	0	2.50	2.63	0
	Overall	25.53	57.85	66.49	39.10	3.99	2.40	3.99	0.64
USA (II)	18-29	30.38	48.96	66.11	48.90	2.92	1.75	0.59	0.39
	30-44	28.91	49.62	65.14	47.16	3.25	2.69	2.70	0.53
	45-59	33.51	60.15	62.47	36.11	1.56	3.56	2.47	0.17
	60-69	44.22	67.79	52.51	30.37	0.21	1.75	3.06	0.10
	70-79	45.73	69.82	51.85	26.79	1.75	3.39	0.67	0
	80+	59.94	76.55	40.06	21.27	0	2.18	0	0
	Overall	33.80	56.50	61.91	40.55	2.31	2.63	1.99	0.31

Source: GENACIS country surveys
† M=Men, W=Women

Table 4 shows the mean volume of drinking in each of the 10 participating countries. In general, Table 4 shows that men drink more than women, in the range of approximately 2-10 times as much. Overall, however, among both men and women, Brazil II stood out at approximately 4 times higher than the next highest mean consumption for women in Nicaragua. However, relative to other countries, Canada, Belize and Brazil I also have higher mean consumption for women. Within these four countries, it is immediately obvious what sets these countries apart in terms of mean alcohol consumption – younger age cohorts. Younger adults under 44 years of age (and especially those 18-29) account for very high daily alcohol consumption compared to older age cohorts in each of the top countries. In comparison to the other countries, their younger aged populations did not report drinking nearly as much alcohol. Among men, Brazil in particular is striking, with a mean daily alcohol consumption volume of between 48 and 73 grams per day for the male population under 70 years old (approximately 2-3 drinks per day). In this country, men report consuming roughly 2-3 times more alcohol than men in other countries. Among women, Nicaraguan women 18-29 reported mean daily consumption levels that were on par with the men from other countries (except Brazil II), which is especially surprising given their high abstinence rate seen from Table 3 (86.9%). As we will see from Table 9, however, the way in which younger aged cohorts consume alcohol is different than older cohorts, and, taking the previous analysis of mortality and morbidity into considerations, reflects the type of alcohol-attributable harm experienced by these groups.

Table 4: Mean volume of alcohol consumption in grams per day among drinkers in participating countries among men and women.

		M†		W†	
	Age Group	**N**	**Mean**	**N**	**Mean**
Argentina	18-29	133	12.98	150	2.12
	30-44	139	15.63	200	1.95
	45-59	94	14.02	183	2.90
	60-69	36	16.47	65	2.90
	Overall		**14.45**		**2.39**
Belize	18-29	587	26.22	687	8.41
	30-44	643	35.07	725	9.12
	45-59	409	33.53	398	8.88
	60-69	143	31.13	151	1.29
	70-79	104	7.35	81	0.68
	80+	25	5.70	32	1.50
	Overall		29.83		7.82
Brazil (I)	18-29	174	19.70	129	4.96
	30-44	180	18.88	124	4.08
	45-59	92	21.25	78	4.13
	60-69	47	18.07	27	2.97
	70-79	17	10.90	7	1.34
	80+	1	13.40	2	1.49
	Overall		19.24		4.25
Brazil (II)	18-29	215	73.52	227	42.78
	30-44	204	68.87	219	36.09
	45-59	130	58.00	108	29.85
	60-69	58	48.45	28	31.79
	70-79	20	47.72	14	22.73
	80+	3	31.28	2	12.00
	Overall		66.15		37.13

		M†		W†	
	Age Group	**N**	**Mean**	**N**	**Mean**
Canada	18-29	978	20.89	1017	8.91
	30-44	1650	14.10	1988	6.53
	45-59	1348	15.37	1720	6.55
	60-69	529	16.02	643	5.71
	70-79	201	14.68	305	6.18
	Overall		**16.12**		**6.85**
Costa Rica	18-29	153	10.33	250	2.05
	30-44	121	6.95	299	1.34
	45-59	90	4.21	195	0.92
	60-69	29	4.48	56	0.17
	70-79	21	6.94	45	0.66
	80+	2	0.14	12	0.71
	Overall		**7.39**		**1.33**
Mexico	18-29	909	9.72	1254	1.08
	30-44	813	10.93	1229	1.41
	45-59	452	10.68	591	0.82
	60-69	107	9.39	137	0.55
	Overall		**10.33**		**1.14**
Nicaragua	18-29	247	32.72	587	17.50
	30-44	187	22.14	510	8.31
	45-59	135	24.43	243	3.35
	60-69	30	10.68	67	0.71
	70-79	9	15.59	9	.
	80+	6	4.30	N/A	
	Overall		**26.07**		**10.93**
Peru	18-29	208	9.84	335	1.48
	30-44	181	3.62	410	1.31
	45-59	87	4.96	222	2.15
	60-69	40	3.23	48	2.00
	Overall		**6.32**		**1.58**
Uruguay	18-29	120	15.64	165	5.48
	30-44	113	11.21	176	2.05
	45-59	105	19.46	203	2.61
	60-69	38	10.53	80	1.78
	Overall		**14.86**		**3.10**
USA (II)	18-29	396	11.53	346	4.25
	30-44	588	12.84	547	4.53
	45-59	334	11.18	254	3.70
	60-69	105	10.59	89	4.86
	70-79	58	10.79	57	5.08
	80+	18	5.78	17	5.27
	Overall		**11.80**		**4.35**

Source: GENACIS country surveys
† M=Men, W=Women

Heavy episodic drinking (also called binge drinking) is defined as having had at least one episode in the past year of consuming 5 or more drinks in one sitting. This type of drinking profile is associated with an increased risk of both acute (injury) and chronic (liver cirrhosis) outcomes. Table 5 shows the summaries of heavy episodic drinking in the 10 selected participating countries. Overall, men report heavy episodic drinking prevalences between 2 and 5 times more than women, except for Brazil II, where the prevalence for women is roughly two-thirds that of the men. Brazil reports the highest prevalence of binge drinking overall and for both genders at over half the population (57.40%), with over two-thirds (65.52%) of the males and almost half of the females (46.32%) reporting at least one episode of past-year binge drinking. Brazil is closely followed by Canada, reporting an overall prevalence of 48.26%, with men at 63.45% and women with a prevalence of 36.7%. It is also noteworthy that among Canadians aged 18-29, 83.9% of the men and 64.7% of the women reported past-year binge drinking, both of which are higher than their Brazilian counterparts, respectively. This age trend is true for most of the countries. Even in countries reporting a low overall prevalence of heavy episodic drinking, men 18-29 have prevalence rates that are approximately 50%. Among women also, those aged 18-29 report prevalences that are higher, and in most cases approximately twice as high, as the overall for women.

Table 5: Prevalence of heavy episodic drinking in participating countries among men and women.

	Overall (%)	Age Group	M† (%)	W† (%)
Argentina	30.07	18-29	61.90	16.68
		30-44	65.92	7.72
		45-59	44.11	5.85
		60-69	26.15	3.58
		Overall	**55.52**	**9.62**
Belize	22.86	18-29	42.46	10.70
		30-44	43.11	11.26
		45-59	36.52	6.93
		60-69	29.49	1.31
		70-79	11.61	0
		80+	10.24	0
		Overall	**38.17**	**8.86**
Brazil (I)	28.45	18-29	45.59	20.30
		30-44	39.06	8.68
		45-59	35.12	9.13
		60-69	21.14	0
		70-79	23.59**	0
		80 +	0	0
		Overall	39.12	12.45
Brazil (II)	57.40	18-29	71.83	58.08
		30-44	72.75	44.19
		45-59	51,26	35.89
		60-69	55.93	23.80
		70-79	33.10	20.92
		80 +	12.43	0
		Overall	65.52	46.32

	Overall (%)	Age Group	M† (%)	W† (%)
Canada	48.26	18-29	83.88	64.66
		30-44	68.41	34.51
		45-59	55.99	30.59
		60-69	42.83	11.76
		70-79	28.67	7.29
		Overall	**63.45**	**36.65**
Costa Rica	22.51	18-29	47.44	19.68
		30-44	32.72	11.37
		45-59	24.85	4.46
		60-69	16.40	1.58
		70-79	21.98	0
		80+	0	0
		Overall	**33.98**	**11.29**
Mexico	28.54	18-29	56.20	8.86
		30-44	64.59	10.10
		45-59	49.26	8.57
		60-69	37.10	4.48
		Overall	**56.60**	**9.04**
Nicaragua	16.8	18-29	49.80	9.03
		30-44	39.57	6.27
		45-59	32.59	2.88
		60-69	13.33	2.99
		70-79	11.11	0
		80+	16.67	--
		Overall	**40.23**	**6.64**
Peru	37.2	18-29	64.90	25.66
		30-44	64.70	26.56
		45-59	52.42	26.74
		60-69	30.00	22.49
		Overall	**59.06**	**26.11**
Uruguay	18.40	18-29	52.50	20.00
		30-44	35.40	3.41
		45-59	26.67	2.46
		60-69	18.42	2.50
		Overall	**36.70**	**7.37**
USA (II)	26.93	18-29	52.42	30.81
		30-44	48.89	22.44
		45-59	29.63	9.57
		60-69	13.16	4.75
		70-79	10.81	2.55
		80+	3.17	0
		Overall	**37.87**	**16.80**

Source: GENACIS country surveys
† M=Men, W=Women
Note: Heavy episodic drinking was determined as having at least one episode of consuming at least 5 drinks in one sitting in the past year
**3 individuals in a total of 14 drinkers

The lowest reported binge drinking was reported by Nicaragua at 16.8% overall, closely followed by Uruguay at 18.40%, although men (and women in Peru) in younger age cohorts reported proportions similar to those seen in other countries. Lastly, it is interesting to note that women 18-29 in the United States report the second-highest proportion of heavy episodic drinkers next to Canada, even though the men in this country did not report similarly relatively high prevalence.

The analysis in Table 6 shows two examples of how the multicentric data can be used to estimate alcohol-related harms (in this case fighting while drinking and injury due to your own or someone else's drinking). The highest prevalences of fighting while drinking were reported in Costa Rica, Nicaragua, The United States, and Brazil (II). In age groups under 60 years, between 20% and 30% of males reported fighting, respectively, and between about 5% and 15% of females in the same age groups reported fighting while drinking. With respect to injury, the top four countries included Canada, The United States, Nicaragua, and Costa Rica, Throughout all countries, though, fighting and injury disproportionately affect the younger age cohorts (18-29 especially). Since these are both acute outcomes of drinking, it is not surprising that the young are affected, given their higher consumption volume overall, and prevalence of heavy episodic drinking, in the same countries that reported a high prevalence of fighting and injury.

Table 6: Past 12-month prevalence of fighting while drinking and injury (to yourself or another person) as a result of drinking among drinkers in participating countries by age and sex . *

		M†		W†	
	Age Group	Fighting while drinking (%)	Ever injured as a result of drinking (%)	Fighting while drinking (%)	Ever injured as a result of drinking (%)
Argentina	18-29	13.17	14.51	3.15	0.58
	30-44	8.62	9.00	0	0
	45-59	3.10	3.88	2.52	2.52
	60-69	0	0	0	0
Belize	18-29	11.94	5.75	1.31	1.38
	30-44	5.14	2.59	4.43	0.57
	45-59	7.22	1.60	0	0
	60-69	5.36	0	0	0
	70-79	0	0	0	0
	80+	33.33	0	0	0
Brazil I	18-29	7.81	4.48	2.16	0
	30-44	4.72	2.06	0.44	0.04
	45-59	1.05	0.53	0.75	0
	60-69	1.77	0	0	0
	70-79	0	0	0	0
	80 +	0	0	0	0
Brazil II	18-29	20.01	5.86	8.84	2.50
	30-44	16.97	2.57	3.25	0.99
	45-59	12.15	2.22	4.64	0
	60-69	10.58	3.17	0	0
	70-79	0	0	0	0
	80 +	0	0	0	0

		M†		W†	
	Age Group	Fighting while drinking (%)	Ever injured as a result of drinking (%)	Fighting while drinking (%)	Ever injured as a result of drinking (%)
Canada	18-29	13.06	10.46	4.01	5.41
	30-44	3.36	7.40	0.94	2.64
	45-59	1.65	3.76	0.22	1.51
	60-69	0.37	4.46	0.30	1.42
	70-79	0	0.63	0	0.27
Costa Rica	18-29	34.16	10.80	10.07	3.36
	30-44	14.07	3.70	3.92	2.40
	45-59	18.32	6.67	4.41	1.09
	60-69	20.08	0	0	9.02
	70-79	30.10	0	0	0
	80+	0	0	0	0
Mexico	18-29	6.03	6.32	0.85	0.56
	30-44	6.63	8.38	0.39	0.65
	45-59	3.52	6.53	0	0.84
	60-69	4.41	8.02	0	0
Nicaragua	18-29	35.80	9.88	25.00	9.38
	30-44	20.00	20.00	6.67	0
	45-59	10.71	14.29	0	0
	60-69	0	0	--	--
	70-79	--	--	--	--
	80+	--	--	--	--
Peru	18-29	10.20	18.82	1.33	39.43
	30-44	4.77	16.17	1.14	40.47
	45-59	3.69	22.42	0.93	43.05
	60-69	5.46	47.23	0	48.55
Uruguay	18-29	8.33	6.48	1.68	0.84
	30-44	2.25	2.25	0	0.83
	45-59	2.38	2.38	1.00	0
	60-69	4.17	0	0	0
USA	18-29	24.33	10.77	14.82	1.49
	30-44	29.33	16.99	9.96	3.33
	45-59	20.21	6.80	6.85	2.86
	60-69	2.79	1.49	2.09	0.80
	70-79	10.51	0	0.91	0.98
	80+	2.64	1.54	0	0

Source: GENACIS country surveys
† M=Men, W=Women
Note: Heavy episodic drinking was determined as having at least one episode of consuming at least 5 drinks in one sitting in the past year. Mexico not surveyed

Other potential Analyses using the Multicentric Data

The multicentric database is a potentially rich source for within country comparisons of individual factors related to either alcohol use or alcohol-related outcomes such as violence, certain health outcomes, other substance abuse, and country-specific contexts of drinking. It is anticipated that this data source will be used to build regressive models that will allow predictive models to be built that will allow for targeted interventions within countries and at the regional level. By combining country-level information about the way people are drinking, it may be possible to better anticipate potential health risks, thereby marrying survey information with burden of disease studies in the same area.

Regional Profile: 2002

Selected representative regional and country-level exposure data is shown in Table 7. One or two countries with the highest adult population were chosen as representative for the region to give an indication of the influence of this country on regional averages and for comparison. All regional average data has been adult population-weighted to reflect the alcohol-consuming population.

Table 7: Characteristics of alcohol consumption in WHO Americas Region (AMR) in 2002 with and each Multicentric Study-participating country according to sub region

WHO Region	Adult Population*	Percent of abstainers		Alcohol Consumption†	Unrecorded Consumption	Pattern Value	Recorded Beverage Most Consumed
		M	W				
AMR A	262,651	32	52	9.4	1.1	2.0	Beer (59%)
Canada	25,838	18	26	8.5	2.0	2	Beer
United States of America	228,220	37	54	9.6	1.0	2	Beer
AMR B	311,514	18	39	8.4	2.6	3.1	Beer (59%)
Argentina	28052440	9	26	8.6	1.0	2	Wine
Belize	158720	24	44	6.8	2.0	4	Beer
Brazil	127,411	13	31	8.8	3.0	3	Beer
Costa Rica	2921100	33	66	5.9	2.0	3	Spirits
Mexico	69,336	35	64	7.7	3.0	4	Beer
Uruguay	2595400	25	43	7.8	2.0	3	Wine
AMR D	46,049	32	51	7.4	4.0	3.1	Spirits and beer (50% each)
Nicaragua	3170280	9	38	2.6	1.0	4	Spirits
Peru	17,761	20	27	9.9	5.9	3	Beer
WHO American Region	620,213	25	45	8.7	2.1	2.6	Beer (58%)
World	4,388,297	45	66	6.2	1.7	2.6	Spirits (55%)

† Adult per capita (age 15+) consumption for 2002 in litres of pure alcohol, derived as average of yearly consumptions from 2001 to 2003, including unrecorded consumption. Numbers may be derived from FAO, World Drink Trends, or WHO Global Alcohol Database depending on availability and accuracy.

In general, increasing economic standing equates to increases in alcohol consumption in the Americas. The highest mean consumption was recorded in AMR A region, followed by AMR B and D. However, unrecorded consumption shows an opposite trend, with AMR D reporting the highest consumption of unrecorded alcohol and AMR reporting the lowest. Also important for attributable burden of disease, however, is the pattern value score. This 4-point scale reflects how people drink instead of how much, and is very important in determining alcohol-attributable harms. A score of 1 characterizes a less detrimental drinking behaviour

(moderate consumption with meals, no irregular heavy drinking), whereas a score of 4 (highest level of irregular, heavy drinking) characterizes alcohol consumption in the most detrimental way for health. AMR A had the lowest mean pattern value in the American region (2.00), followed by AMR B and D, which were roughly equal at just over three. This confirms previous research, which shows that drinking patterns are worse (scores of 3 and 4) for developing countries, such as those in Central America, whereas countries in North America and the Caribbean tend to have less detrimental pattern scores of around 2 (Rehm et. al 2004). Both pattern score and unrecorded alcohol consumption play a significant role in determining alcohol-attributable mortality and burden, which will be confirmed in the following tables. Also of note is that both AMR A and B were predominantly beer-drinking culture, whereas AMR D consumed both spirits and beer in roughly equal amounts. The most populous countries in each region are interesting in terms of their effect on the overall values for the sub region and region, specifically for AMR B and AMR D (since AMR A (specifically the USA) drives much of the average for the region of the Americas as a whole). Mexico has atypically very high abstention rates for AMR B, and consequently lower per capita consumption than that of AMR B and the entire American region, however the pattern value reflects a harmful pattern of drinking among those who do drink. This is the opposite for Peru, where atypically low numbers of abstainers drive up the alcohol per capita consumption values. This, combined with a detrimental drinking pattern, leads to high rates of alcohol-related harm in these regions, as the tables below will illustrate.

It is interesting to see how certain alcohol consumption patterns may manifest themselves in certain alcohol-related outcomes on an individual country-level basis. The remainder of this report summarizes the overall burden of disease on a WHO regional and sub-regional level with respect to alcohol-attributable burden of disease.

Alcohol-attributable mortality on a regional and sub regional level

Table 8 shows the alcohol-attributable mortality in each of the three sub regions of the Americas and their relative percentages compared to the total mortality in the sub region. Alcohol consumption caused a considerable number of deaths in this region. 8.7% of all deaths among men and 1.7% of deaths among women were attributable to alcohol in the Americas in 2002. The mortality toll by alcohol in this region thus was considerably higher than in the rest of the world, but there was considerable variation across sub regions. AMR B reported the highest relative numbers of deaths attributable to alcohol, with 13.9% and 3.1% of all deaths among men and women, respectively. This was followed by AMR D, and then finally AMR A, which reported the lowest relative numbers of alcohol-attributable deaths. Major disease categories that had the most alcohol-attributable deaths were unintentional injuries (approximately 93,000), intentional injuries (70,000), and liver cirrhosis (64,000). Across all three of these categories, men accounted for the overwhelming majority of deaths, which was true of all disease categories across all sub regions (85.6% for men, 14.4% for women).

Table 8: Deaths* attributable to alcohol consumption in WHO Americas Region (AMR) in 2002

Disease Category	AMR A		AMR B		AMR D		AMR Total				World			
	no.		no.		no.		no.		%		no.		%	
	M†	W†	M	W	M	W	M	W	M	W	M	W	M	W
Maternal and perinatal conditions (low birth weight)	0	0	0	0	0	0	0	0	0.0	0.2	1	1	0.1	0.4
Cancer	15	9	13	8	1	1	30	19	10.7	40.1	361	105	19.7	36.7
Diabetes mellitus	-4	-1	0	0	0	0	-4	-1	-1.3	-2.0	-8	-4	-0.4	-1.3
Neuropsychiatric disorders	7	2	15	2	2	0	24	5	8.8	9.8	106	25	5.7	8.6
Cardiovascular diseases	-17	-19	45	10	3	1	31	-8	11.1	-17.4	361	-53	19.7	-18.4
Cirrhosis of the liver	15	6	31	7	4	1	50	14	18.3	30.7	293	77	16.0	26.7
Unintentional injuries	20	6	53	6	7	1	80	13	29.0	27.0	501	96	27.3	33.3
Intentional injuries	7	2	54	3	3	0	65	5	23.4	11.7	220	40	12.0	14.1
All alcohol-attributable deaths	**44**	**6**	**211**	**36**	**21**	**4**	**276**	**47**	**100.0**	**100.0**	**1,836**	**287**	**100.0**	**100.0**
All deaths	1,363	1,356	1,514	1,186	293	248	3,170	2,791			29,891	27,138		
Percentage of all deaths attributable to alcohol	**3.2**	**0.4**	**13.9**	**3.1**	**7.3**	**1.7**	**8.7**	**1.7**			**6.1**	**1.1**		

* numbers are rounded to the nearest thousand. Zero (0) indicates fewer than 500 alcohol-attributable deaths in the disease category
† M=Men, W=Women
Source: own calculations based on WHO mortality statistics

There were some major differences among sub-regions, however. Most notable is the relationship between alcohol and cardiovascular diseases in AMR A that was not seen in other regions or categories. This was due to the preventive effect of alcohol consumption being modeled only in this region, based on the more favorable pattern score. This resulted in a net effect for women in AMR A of only 6,000 alcohol-attributable deaths in total. Among men, the large number of deaths in the injury, cirrhosis, and cancer categories outweighed those deaths prevented in cardiovascular diseases.

Alcohol-attributable years of life lost (YLLs)

Table 9 shows the results of the alcohol-attributable years of life lost (YLLs) for the Americas in 2002. Many of the same trends remained true for men and women as

was seen in the alcohol-attributable deaths. Men accounted for the majority of YLLs with 86.6% of all YLLs and women accounting for 13.4%. Across all three sub regions injuries accounted for a large proportion of the total YLLs (66.3% among men, 44.5% among women), followed by liver cirrhosis, and neuropsychiatric disorders.

Between sub regions, AMR A and AMR D showed comparable relative YLLs for their region, but AMR B showed much higher relative numbers of YLLs for both men and women. The major differences seen between AMR A and B are in the injury categories, cardiovascular diseases (protective effect in AMR A not modeled in AMR B), and liver cirrhosis among men, where AMR B has far greater relative numbers than AMR A. Of note in this table as well is the protective effect of alcohol on diabetes in terms of YLL. Comparing relative alcohol-attributable YLL globally, AMR A and D show comparable prevalences, whereas AMR B was about 3 times the global average for men and women.

Table 9: Years of life lost (YLLs)* attributable to alcohol consumption in WHO Americas Region (AMR) in 2002

Disease Category	AMR A		AMR B		AMR D		AMR Total				World			
	no.		no.		no.		no.		%		no.		%	
	M†	W†	M	W	M	W	M	W	M	W	M	W	M	W
Maternal and perinatal conditions (low birth weight)	1	1	3	2	0	0	4	3	0.1	0.3	47	37	0.1	0.6
Cancer	169	110	161	112	13	12	343	234	6.1	26.8	4,510	1,368	13.9	24.3
Diabetes mellitus	-39	-13	0	5	0	0	-39	-8	-0.7	-0.9	-85	-30	-0.3	-0.5
Neuropsychiatric disorders	114	35	274	42	46	9	434	85	7.7	9.8	2,005	484	6.2	8.6
Cardiovascular diseases	-145	-156	472	110	37	11	364	-35	6.5	-4.0	4,223	-250	13.0	-4.4
Cirrhosis of the liver	211	88	506	101	70	15	787	205	14.0	23.5	4,403	1,118	13.5	19.9
Unintentional injuries	449	103	1325	126	170	17	1944	245	34.6	28.2	11,910	1,963	36.6	34.9
Intentional injuries	187	43	1510	93	82	6	1779	143	31.7	16.4	5,540	934	17.0	16.6
All alcohol-attributable YLLs	947	210	4,250	591	419	70	5,616	871	100.0	100.0	32,553	5,625	100.0	100.0
All YLLs	**11,468**	**8,478**	**22,977**	**14,375**	**5,410**	**4,378**	**39,855**	**27,232**			**496,059**	**426,418**		
Percentage of all YLLs attributable to alcohol	**8.3**	**2.5**	**18.5**	**4.1**	**7.7**	**1.6**	**14.1**	**3.2**			**6.6**	**1.3**		

* numbers are rounded to the nearest thousand. Zero (0) indicates fewer than 500 alcohol-attributable YLLs in the disease category
† M=Men, W=Women
Source: own calculations based on WHO mortality statistics

Alcohol-attributable disability-adjusted life-years (DALYs)

Table 10 shows the alcohol-attributable disability-adjusted life-years (DALYs) in the Americas in 2002. The biggest difference seen in this table was the high alcohol-attributable burden of disease due to neuropsychiatric disorders in all three sub regions. Alcohol-attributable neuropsychiatric burden of disease was the largest single contributor to DALYs among both men and women in all three sub regions, accounting for roughly the same burden of disease as both injury categories combined. Similar trends are seen as for the other disease burden indicators with respect to gender differences (82.4% for men, 17.6% for women), the protective effect of alcohol on cardiovascular burden of disease, and high burden due to injury categories.

The sub region reporting the lowest relative alcohol-attributable burden of disease is not AMR A as in previous estimates, but AMR D. In this sub region, among both men and women, alcohol accounted for about one-third as many DALYs as AMR A and about half as many as AMR B.

However, all three regions had considerably higher estimates of disease burden compared to the global estimates of 7.1% and 1.4%, respectively among men and women. In total, the alcohol-attributable burden of disease in the American region is proportionally more than twice compared to the global estimates.

Table 10: Disability adjusted life years (DALYs)* attributable to alcohol consumption in WHO Americas Region (AMR) in 2002

Disease Category	AMR A		AMR B		AMR D		AMR Total				World			
	no.		no.		no.		no.		%		no.		%	
	M†	W†	M	W	M	W	M	W	M	W	M	W	M	W
Maternal and perinatal conditions (low birth weight)	1	1	3	3	1	0	5	4	0.0	0.2	52	42	0.1	0.4
Cancer	179	135	164	118	13	12	357	264	3.0	10.3	4,593	1,460	8.4	14.6
Diabetes mellitus	-90	-29	0	8	0	0	-90	-21	-0.8	-0.8	-225	-66	-0.4	-0.7
Neuropsychiatric disorders	2189	663	3156	837	323	84	5667	1584	47.1	61.7	19,393	3,722	35.3	37.2
Cardiovascular diseases	-131	-188	530	129	41	12	440	-48	3.7	-1.8	4,877	-318	8.9	-3.2
Cirrhosis of the liver	256	113	629	136	91	21	976	269	8.1	10.5	5,415	1,468	9.9	14.7
Unintentional injuries	526	133	1707	184	225	24	2458	340	20.4	13.2	14,499	2,647	26.4	26.5
Intentional injuries	205	48	1914	120	94	7	2213	176	18.4	6.8	6,366	1,051	11.6	10.5
All alcohol-attributable DALYs	3,136	875	8,103	1,533	787	161	12,026	2,569	100.0	100.0	54,970	10,006	100.0	100.0
All DALYs	**24,528**	**22,340**	**45,653**	**35,936**	**8,992**	**8,137**	**79,173**	**66,413**			**772,912**	**717,213**		
Percentage of all DALYs attributable to alcohol	**12.8**	**3.9**	**17.7**	**4.3**	**8.8**	**2.0**	**15.2**	**3.9**			**7.1**	**1.4**		

* numbers are rounded to the nearest thousand. Zero (0) indicates fewer than 500 alcohol-attributable DALYs in the disease category
† M=Men, W=Women
Source: own calculations based on WHO mortality statistics

Discussion

Before the implications of this overview of the regional data and its relationships to mortality and morbidity in the Americas are discussed, it is important to address some methodological issues. First, the relative risks for the alcohol-attributable mortality and morbidity estimation were derived from meta-analyses and are assumed to be consistent across countries, due mostly to the fact that they reflect biological mechanisms. This assumption is probably not problematic for Americas A region, since most studies included in the meta-analyses are from European or North American countries with similar genetic background and health care systems. However, the AAFs for injury may be more problematic as the relationship between alcohol and injury has been shown to be influenced by culture to a large degree. Second, the estimates for the age group 70 years and older are an overestimate, both for beneficial and detrimental effects. Relative risks have been shown to decrease with age and, while there are quantifications of this effect for major tobacco-related risks, no quantification exists for alcohol-attributable disease (see also Rehm et al., 2006a for references and further information). Last, the survey data may somewhat underestimate consumption in heavy drinking categories due to the undercoverage of heavy drinking populations such the homeless, the military and the institutionalised, although such adjustments have been found not to greatly affect survey estimates overall, at least in the USA (Weisner et al, 1995). However, despite these issues, the estimates are the most current and best possible for the individual countries and the region, and should be extremely valuable for informing alcohol policy accordingly.

There are a number of main results of this limited, preliminary analysis. They are:

- Overall consumption in the Americas is high compared to global averages.
- Alcohol consumption and the prevalence of dangerous drinking behaviour (heavy episodic drinking) are high among young men and women in all countries in the Americas.
- The alcohol-attributable burden of disease of young adults is especially high, particularly in America B and D.
- The alcohol-attributable burden for young people, both men and women, is high.
- Neuropsychiatric diseases constitute a major proportion of years of life lost and disability adjusted life-years.

Practices to reduce per capita consumption (Babor et al., 2003; Anderson & Baumberg, 2006) should apply to the Americas, such as taxation and availability restrictions. These availability restrictions include measures to increase the minimum age to drink alcohol, alcohol retail outlet density and hours of operation, availability at sporting vents, and minimizing alcohol advertisements and marketing (Anderson & Baumberg, 2006; Rehm et al., 2004; Babor et al., 2003; Giesbrecht & Greenfield,

2003). With respect to taxation, there is clear evidence that consumers react to prices for goods including alcohol. Newer economic literature found this behaviour even in people with alcohol dependence (see chapter 6 in Babor et al., 2003). Given the relatively low tax rate in most of the American countries (especially in South and Central America) and given the high consumption of countries such as Canada, Belize, and Brazil, an increase of the taxation of alcoholic beverages should be a priority for alcohol policy in this region given its effect on consumption and its and cost-effectiveness (Chisholm et al., 2004; 2006).

The second and third major findings of this brief analysis found that young people consume much of the alcohol, consume it in a more dangerous way, and more often suffer two alcohol-related acute outcomes (injury and fighting) than older age cohorts. Given this consumption behaviour, the alcohol-attributable burden of disease for acute outcomes is especially high. A number of policy options are particularly effective in reducing the alcohol consumption in this group, such as price increases and raising the age at which young people can legally purchase liquor in on and off-license establishments (Babor et al., 2003). Enforcement of such minimum drinking age laws in developing and developed countries alike is a limitation of this approach that needs to be taken account of for such measures to be effective (Giesbrecht & Greenfield, 2003).

Neuropsychiatric diseases constitute a major proportion of the alcohol-attributable burden. Within this category, alcohol use disorders make up the highest proportion of this category (Rehm & Monteiro 2005), especially in Americas B and D. The use of the screening and brief interventions in primary health care to increase referral to treatment services, along with the organization of an integrated health system, provides effective treatment for alcohol dependence and harmful use of alcohol (Babor et al. 2001). Self-help groups such as AA and social services should be linked to treatment services to support recovery and rehabilitation. There are a number of effective treatments for alcohol dependence, including cognitive behavior therapies (Marques & Formigoni 2001; Morgenstern et al. 2001; Hoyer et al. 2001), brief intervention/counseling (Mundt 2006), and pharmacotherapy (Chick et al. 2000), and combinations of these together (Anton et al. 1999), which can be offered through various outpatient or inpatient services.

This analysis is a preliminary analysis of major alcohol indicators and one alcohol-related outcome. It is hoped and encouraged that more in-depth analysis involving social risk-factor analyses in predictive models will be done with the regional data to investigate country-specific alcohol-related issues. Despite cultural differences between countries, the harm caused by alcohol is a regional public health concern, and one that is growing as alcohol consumption and heavy drinking occasions increase. Alcohol policies generally take time to develop, gain legislative support, win political consensus and garner sufficient public support for long-term maintenance (Greenfield et al 2004a; 2004b). Studies have shown that research information, when properly presented, can at times provide needed support at

critical times to strengthen the efforts to enact empirically sound policies (Johnson et al, 2004). Policies to reduce the alcohol-attributable burden need national, country-level implementation in order for success in this area. Using results from surveys like the GENACIS will continue to provide this kind of specialized, country-specific knowledge around which good, effective policy can be built.

Next steps

The PAHO multicentric project was a landmark endeavor and large step in estimating alcohol consumption and related harm in North, Central and South America. Once this harm is quantified, however, there remains a large amount of work of how to reduce it in a meaningful way. Efforts aimed at evaluating policy in developing nations, across races, and within cultures are needed. Information of the kind generated by these surveys will aid in forming these policies, but it is a lost cause if they cannot be evaluated and changed as need warrants.

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Appendices

Appendix 1: GENACIS Core Questionnaire CASE ID: |___|___|___|___|

INTERVIEWER ID: |___|___|___|___|

GENDER, ALCOHOL, AND CULTURE: AN INTERNATIONAL STUDY (GENACIS)
CORE QUESTIONNAIRE:

DEMOGRAPHICS

1. What is your gender?

Male	1
Female	2

2. What is your date of birth?

|___|___| |___|___| |___|___| OR |___|___| |___|___| |___|___|
MONTH DAY YEAR DAY MONTH YEAR

3. What is the highest grade or year of school you have completed? *REVISE TO FIT EACH COUNTRY'S EDUCATIONAL SYSTEM*

No formal schooling	1
8th grade or less	2
Some high school	3
High school diploma or G.E.D	4
Some college or 2 year degree	5
Bachelor's degree	6
Graduate or professional school	7

4. What best describes your ethnic group? *USE CULTURALLY APPROPRIATE ETHNICITY CATEGORIES*

_____

5. Which of these categories comes closest to the type of place where you presently live?

In open country but not on a farm	1
On a farm	2
In a small city or town (under 50,000)	3
In a medium-size city (50,000-250,000)	4
In a suburb near a large city	5
In a large city	6

6. What is your marital status? (Are you married, living with a partner in a marriage like relationship, widowed, divorced, separated, or have you never been married?)

Married	1
Living with a partner/ Common-law marriage	2
Widowed	3
Divorced	4
Married but separated	5
Never married	6 *(SKIP to Q. 7)*

ATTENTION: IF YOU HAVE NEVER BEEN MARRIED PLEASE ANSWER Q. 7

7. Have you ever lived with a partner in a marriage like relationship?

Yes	1
No	2

ATTENTION: IF YOU ARE WIDOWED, DIVORCED, SEPARATED, OR HAVE NEVER MARRIED (Q. 6A = 3, 4, 5, OR 6), GO TO Q. 8.
IF YOU ARE MARRIED (Q. 6A = 1), SKIP TO Q. 11.
IF YOU ARE LIVING WITH A PARTNER (Q. 6A = 2), SKIP TO Q. 10.

8. Among the people who you now know, is there someone with whom you have a very close romantic relationship?

Yes	1 *(GO TO Q. 9)*
No	2 *(SKIP TO Q. 11)*

10. Is (this person/your partner) male or female?

Male	1
Female	2

11. How many people are living in your household, including yourself, your spouse or partner, and any other family members living with you?

|___|___| people

12. Have you ever had any children, including adopted or stepchildren?

Yes	1
No	2 *(SKIP TO Q. 14)*

13. How many children under age 18 live with you, including adopted, stepchildren, your partner's children, or grandchildren?

|___|___| children

WORK EXPERIENCES

14. What is your present occupation or occupations? *INCLUDE HOMEMAKER/HOUSEWIFE/ HOUSEHUSBAND AS AN OCCUPATION.*

_____

OPTION: If the respondent has difficulty answering this question, the interviewer may provide a locally appropriate set of occupational categories.

15. What is your present daily occupation/employment status? *CIRCLE ONE. REFERENCE TO EMPLOYMENT STATUS AND EMPLOYMENT CATEGORIES MAY NEED TO USE LOCAL TERMS WITH SIMILAR MEANINGS.*

Working for pay	8	*(GO TO Q. 16A)*
Involuntarily unemployed	7	*(SKIP TO Q. 20)*
Student	6	*(SKIP TO Q. 20)*
Retired	5	*(SKIP TO Q. 20)*
Not working due to illness	4	*(SKIP TO Q. 20)*
Parental or pregnancy leave	3	*(SKIP TO Q. 20)*
Homemaker	2	*(SKIP TO Q. 20)*
Voluntarily unemployed for other reasons	1	*(SKIP TO Q. 20)*

16A. What is your present employment situation?

Employed until I quit or retire	4
Employed until I am laid off or fired	3
Employed until the (project/task/job) I was hired for is finished	2
Employed only temporarily (or off-and-on/intermittently)	1

16B. Are you self-employed or are you employed by others?

Self-employed	1
Employed by others	2

17. Do you usually work: *CIRCLE ALL THAT APPLY. REVISE TO FIT EACH COUNTRY'S WORK SCHEDULE.*

Day time	4
Evenings	3
Night time	2
Shift work	1

18. Which of the following best describes the people you work with or who work alongside you?

All or nearly all are men	6
A majority are men	5
Half are women, half are men	4
A majority are women	3
All or nearly all are women	2
I work alone or by myself	1

19. How stressful is your work situation? *NOTE TO INVESTIGATOR: THIS REFERS TO NEGATIVE STRESS OR DISTRESS.*

Very stressful	4
Somewhat stressful	3
A little stressful	2
Not at all stressful	1

20. What is your total household income, before taxes and from all sources? By household income we mean income earned by you (IF APPLICABLE: and by your spouse/cohabiting partner, and by any other family members living with you) and any income from other sources, such as child support or pensions. *USE CULTURALLY APPROPRIATE INCOME CATEGORIES.*

21. How much of the total household income, from all sources, do you yourself provide?

All of it	5
More than half	4
About half	3
Less than half	2
None	1
REFUSED	0

SOCIAL NETWORKS

22A. How many times during the last 30 days have you had informal and supportive contacts with relatives, friends and neighbors, including letters, phone calls, or e-mails?

Daily or almost every day	5
Several times a week	4
Once or twice a week	3
One to three times in the last 30 days	2
Not at all during the last 30 days	1

22B. Apart from your spouse/partner/romantic (non-cohabiting) partner, how many persons do you feel confident that you can talk to about an important personal problem?

6 or more	5
4-5	4
2-3	3
One	2
None	1

DRINKING BEHAVIOR

MEASUREMENT OF GENERIC CONSUMPTION
The next few questions are about the use of alcoholic beverages, such as wine, beer, and liquor, by yourself and by people you know.

24. During the last 12 months, how often did you usually have any kind of beverage containing alcohol – whether it was wine, beer, liquor *(OR OTHER CULTURALLY UNIQUE DRINKS THAT MIGHT NOT BE RECOGNIZABLE TO THE RESPONDENT WITHOUT SPECIFYING THE COLLOQUIAL NAME),* or any other drink?

Every day or nearly every day,	9
Three or four times a week,	8
Once or twice a week,	7
One to three times a month,	6
Seven to eleven times in the last 12 months,	5
Three to six times in the last 12 months,	4
Twice in the last 12 months,	3
Once in the last 12 months, or	2
Never in the last 12 months?	1 *(SKIP TO Q. 33A)*

26A. On those days when you had any kind of beverage containing alcohol, how many drinks did you usually have per day?

|___|___| drinks *(OR ANSWERED IN THE RESPONDENT'S TERMS AND POST CODED TO THE GRAM RANGES IN Q. 25A2-A7)*

A1.	NOTE: ALL INSTRUCTIONS TO THE RESEARCHER ARE IN CAPITAL LETTERS AND SHOULD NOT BE READ TO THE RESPONDENT. ALL QUESTIONS FOR THE RESPONDENT ARE IN BOLD-FACE TYPE. The next few questions are about how much wine, beer, and liquor (OR OTHER CULTURALLY UNIQUE DRINKS THAT MIGHT NOT BE RECOGNIZABLE TO THE RESPONDENT WITHOUT SPECIFYING THE COLLOQUIAL NAME) you may have had during the last 12 months. When we say one drink, we mean....(THE RESEARCHER SHOULD NOW DESCRIBE THE VARIOUS TYPES OF ALCOHOLIC BEVERAGES AND POSSIBLE SIZES TO APPROXIMATE A TYPICAL "DRINK SIZE" IN THAT PARTICULAR CULTURE. A STANDARD "DRINK" WILL BE DEFINED AS CONTAINING APPROXIMATELY 12 GRAMS OF ETHANOL, AND ALL SUBSEQUENT QUESTIONS WILL BE IN "GRAMS OF ETHANOL, " FOLLOWED BY THE NORTH AMERICAN EQUIVALENCY IN NUMBER OF DRINKS. THE RESEARCHER SHOULD CONVERT THE GRAMS OF ETHANOL ITEMS TO THE APPROPRIATE EQUIVALENT NUMBER OF DRINKS/UNITS FOR THAT CULTURE.) Think of all kinds of alcoholic beverages combined, that is, any combination of cans, bottles or glasses of beer; glasses of wine; or drinks containing liquor of any kind (OR THE CULTURAL EQUIVALENT TO THIS STATEMENT). During the last 12 months, what is the largest number of drinks you had on any single day? Was it:		
	(ASK A2)	240 grams or more of ethanol in a single day (20 or more drinks in a single day,)	a
	(ASK A2)	at least 144, but less than 240 g (at least 12, but less than 20 drinks,)	a
	(SKIP TO A3)	at least 96, but less than 144 g (at least 8, but less than 12 drinks,)	b
	(SKIP TO A4)	at least 60, but less than 96 g (at least 5, but less than 8 drinks,)	c
	(SKIP TO A5)	at least 36, but less than 60 g (at least 3, but less than 5 drinks,)	d
	(SKIP TO A6)	at least 12, but less than 36 g (at least 1, but less than 3 drinks,)	e
	(SKIP TO A7)	at least 1, but less than 12 g (at least a sip, but less than one full drink,)	f
	(SKIP TO Q. 48A)	DID NOT DRINK AT ALL IN THE LAST 12 MONTHS	g
	(ASK A2)	DON'T KNOW	98
	(ASK A2)	REFUSED	97

(DO NOT READ. FOR REFERENCE ONLY.)			
QUANTITY OF DRINK EQUIVALENCES (IN U.S. STANDARDS) RESEARCHERS SHOULD FILL IN APPROPRIATE TERMS/SIZES FOR THEIR CULTURE			
12 drinks =	12 cans of beer	5 drinks =	5 cans of beer
	4-1/4 quarts of beer		1-3/4 quarts of beer
	2 regular-size bottles of wine		3/4 bottle of wine
	1/2 gallon of wine		1/5 a fifth of liquor
	1/2 fifth of liquor		1/3 pint of liquor
	3/4 pint of liquor		
		3 drinks =	3 cans of beer
			1 quart of beer
8 drinks =	8 cans of beer		1/2 bottle of wine
	3 quarts of beer		1/3 of a ½ pint of liquor
	1-1/4 bottles of wine		
	1/2 pint of liquor	1 drink =	1 - 12 oz. can or bottle of beer
	1/3 fifth of liquor		1 - 4 oz. glass of wine
			1 mixed drink with 1 shot liquor
One 12 oz. bottle of wine cooler equals one drink			

A2.	During the last 12 months, how often did you have at least 144, but less than 240 grams ethanol (at least 12, but less than 20 drinks) of any kind of alcoholic beverage in a single day, that is, any combination of cans, bottles or glasses of beer, glasses of wine, or drinks containing liquor of any kind (or cultural equivalent to these terms/containers)? Was it:
A3.	During the last 12 months, how often did you have at least 96, but less than 144 grams ethanol (at least 8, but less than 12 drinks) of any kind of alcoholic beverage in a single day, that is, any combination of cans, bottles or glasses of beer, glasses of wine, or drinks containing liquor of any kind (or cultural equivalent to these terms/containers)? Was it:
A4.	During the last 12 months, how often did you have at least 60, but less than 96 grams ethanol (at least 5, but less than 8 drinks) of any kind of alcoholic beverage in a single day, that is, any combination of cans, bottles or glasses of beer, glasses of wine, or drinks containing liquor of any kind (or cultural equivalent to these terms/containers)? Was it:
A5.	During the last 12 months, how often did you have at least 36, but less than 60 grams ethanol (at least 3, but less than 5 drinks) of any kind of alcoholic beverage in a single day, that is, any combination of cans, bottles or glasses of beer, glasses of wine, or drinks containing liquor of any kind (or cultural equivalent to these terms/containers)? Was it:
A6.	During the last 12 months, how often did you have at least 12, but less than 36 grams ethanol (at least 1, but less than 3 drinks) of any kind of alcoholic beverage in a single day, that is, any combination of cans, bottles or glasses of beer, glasses of wine, or drinks containing liquor of any kind (or cultural equivalent to these terms/containers)? Was it:

A7.	During the last 12 months, how often did you have at least a sip, but less than 12 grams ethanol (at least a sip, but less than one full drink) of any kind of alcoholic beverage in a single day, that is, any combination of cans, bottles or glasses of beer, glasses of wine, or drinks containing liquor of any kind (or cultural equivalent to these terms/containers)? Was it:	A2	A3	A4	A5	A6	A7
		144-239 GRAMS	96-143 GRAMS	60-95 GRAMS	36-59 GRAMS	12-35 GRAMS	1-11 GRAMS
	Every day or nearly every day,	9	9	9	9	9	9
	Three or four times a week,	8	8	8	8	8	8
	Once or twice a week,	7	7	7	7	7	7
	One to three times a month,	6	6	6	6	6	6
	Seven to eleven times in the last 12 months,	5	5	5	5	5	5
	Three to six times in the last 12 months,	4	4	4	4	4	4
	Twice in the last 12 months,	3	3	3	3	3	3
	Once in the last 12 months, or	2	2	2	2	2	2
	Never in the last 12 months?	1	1	1	1	1	1

26B. On a typical day when you drank, about how much time would you spend drinking?

|____|____| minutes OR |____|____| hours

27. How old were you when you first began drinking, more than just a sip or a taste?

|____|____| years old

FAMILIAL AND OTHER DRINKING CONTEXTS

28. Thinking back over the last 12 months, about how often did you drink in the following circumstances? Think of all the times that apply in each situation. For example, having a drink with a meal in your own home should be included under both "(a) at a meal", and "(c) in your own home."

	Every day or nearly every day	Three or four times a week	Once or twice a week	One to three times a month	Seven to eleven times in the last 12 months	Three to six times in the last 12 months	Once or twice in the last 12 months	Never in the last 12 months
a. at a meal	8	7	6	5	4	3	2	1
b. at a party or celebration	8	7	6	5	4	3	2	1
c. in your own home	8	7	6	5	4	3	2	1
d. at a friend's home	8	7	6	5	4	3	2	1
e. at your workplace	8	7	6	5	4	3	2	1
f. in a bar/pub/disco	8	7	6	5	4	3	2	1
g. in a restaurant	8	7	6	5	4	3	2	1

29. How often in the last 12 months have you had a drink when you were with the following persons? Think of all the times that apply for each person. For example, having a drink with your spouse or partner and friends should be included under both "(a) with your spouse or partner," and "(d) with friends."

	Every day or nearly every day	Three or four times a week	Once or twice a week	One to three times a month	Seven to eleven times in the last 12 months	Three to six times in the last 12 months	Once or twice in the last 12 months	Never in the last 12 months
a. with your spouse/ partner/romantic (non-cohabiting) partner whether or not other people were present?	8	7	6	5	4	3	2	1
b. with a family member other than your spouse/ partner/romantic (non-cohabiting) partner?	8	7	6	5	4	3	2	1
c. with people you work with or go to school with?	8	7	6	5	4	3	2	1
d. with friends other than your spouse or partner?	8	7	6	5	4	3	2	1
e. when no one happened to be with you?	8	7	6	5	4	3	2	1

IF NECESSARY, COMBINE RECOMMENDED FREQUENCY CATEGORIES INTO A SMALLER NUMBER OF CATEGORIES, BUT
a. Keep the extreme options: NEVER, AND EVERY DAY OR NEARLY EVERYDAY
b. Combine whole categories from the current frequency list.

DRINKING CONSEQUENCES

Next are some questions about drinking-related experiences many people have during their lifetime.

30A. During the last 12 months, has YOUR drinking had a harmful effect...

a. on your work, studies or employment opportunities?	NO 1 YES, ONCE OR TWICE 2 YES, THREE OR MORE TIMES 3
b. on your housework or chores around the house?	NO 1 YES, ONCE OR TWICE 2 YES, THREE OR MORE TIMES 3
c. on your marriage/intimate relationships?	NO 1 YES, ONCE OR TWICE 2 YES, THREE OR MORE TIMES 3
d. on your relationships with other family members, including your children?	NO 1 YES, ONCE OR TWICE 2 YES, THREE OR MORE TIMES 3
e. on your friendships or social life?	NO 1 YES, ONCE OR TWICE 2 YES, THREE OR MORE TIMES 3
f. on your finances?	NO 1 YES, ONCE OR TWICE 2 YES, THREE OR MORE TIMES 3

30B. During the last 12 months, have you gotten in a fight while drinking?

No	1
Yes, once or twice	2
Yes, three or more times	3

30C. How often during the last 12 months have you .....

	Daily or almost daily	Weekly	Monthly	Less than monthly	Never
a. drunk enough to feel the effects of the alcohol—for example, your speech was slurred and/or you had trouble walking steadily?	4	3	2	1	0
b. had a headache and/or felt nauseated as a result of your drinking?	4	3	2	1	0
c. taken a drink to get over any of the bad after-effects of drinking?	4	3	2	1	0
d. felt sick or found yourself shaking when you cut down or stopped drinking?	4	3	2	1	0
e. found that you were not able to stop drinking once you had started?	4	3	2	1	0
f. failed to do what was normally expected from you because of drinking?	4	3	2	1	0
g. needed a first drink in the morning to get yourself going after a heavy drinking session?	4	3	2	1	0
h. had a feeling of guilt or remorse after drinking?	4	3	2	1	0
i. been unable to remember what happened the night before because you had been drinking?	4	3	2	1	0

31. Have you or someone else been injured as a result of your drinking?

Yes, during the last year	4
Yes, but not in the last year	2
Never	0

NOTE TO RESEARCHER: Q. 30e – i, and Q. 31 are coded to be consistent with the AUDIT.

32. During the last 12 months, have any of the following persons attempted to influence your drinking so that you would drink less or cut down on your drinking?

a. Your spouse/partner/romantic (non-cohabiting) partner?	YES 1 NO 2
b. Your child or children?	YES 1 NO 2
c. Some other female member of your family?	YES 1 NO 2
d. Some other male member of your family?	YES 1 NO 2
e. Someone at your work or at school?	YES 1 NO 2
f. A female friend or acquaintance?	YES 1 NO 2
g. A male friend or acquaintance?	YES 1 NO 2
h. A doctor or health worker?	YES 1 *(SKIP TO Q. 34A)* NO 2 *(SKIP TO Q. 34A)*

ASK 33A–C ONLY OF CURRENT ABSTAINERS (NEVER DRANK IN THE LAST 12 MONTHS).

33A. Did you ever have a drink of any beverage containing alcohol?

Yes	1 (ASK Q. 33B)
No	2 (SKIP TO Q. 34A)

33B. How old were you when you began drinking, more than just a sip or a taste?

|___|___| years old

33C. Was there ever a time when your drinking caused any problems in your life (for example, problems with family, health, or work, or with the law or the police)?

Yes	1
No	2

INTIMATE RELATIONS AND SEXUALITY

IF NO SPOUSE/PARTNER/ROMANTIC (NON-COHABITING) PARTNER, SKIP TO Q. 39.

34A. Thinking back over the last 12 months, about how often did your spouse/partner/romantic (non-cohabiting) partner drink alcoholic beverages? Remember to include all kinds of alcoholic beverages... spirits, wine, beer.

Every day or nearly every day	8
Three or four times a week	7
Once or twice a week	6
One to three times a month	5
Seven to eleven times in the last 12 months	4
Three to six times in the last 12 months	3
Once or twice in the last 12 months	2
Never in the last 12 months	1

34B. Again, thinking back over the last 12 months, about how many drinks would your spouse/partner/romantic (non-cohabiting) partner have on a typical day when he/she drank? Please think of all kinds of alcoholic beverages combined.

|____|____| drinks

35. Please circle the number which best describes how happy you are with your relationship with your current spouse/partner/romantic (non-cohabiting) partner.

1	2	3	4	5
Extremely Unhappy				Extremely Happy

36. Please circle the number which describes how easy it generally is for you to talk about your feelings or problems with your spouse/partner/romantic (non-cohabiting) partner?

1	2	3	4	5
Very Difficult				Very Easy

37. How often do you and your spouse/partner/romantic (non cohabiting) partner quarrel?

At least once a day	5
Several times a week	4
Several times a month	3
Once a month or less	2
Never	1

38. During the last 12 months, how much of your drinking has been with your spouse/partner/romantic (non cohabiting) partner?

All or almost all occasions	5
Most occasions	4
Some occasions	3
A few occasions	2
Never	1
I do not drink	0

39. What was your age when you first had consensual sexual intercourse?

Enter age for first time: |___|___| years
Never had consensual sexual intercourse: |___| *(SKIP TO Q. 41)*

40. During the last 12 months, how many partners have you had sexual activity with? (PLEASE WRITE IN A NUMBER).

|___|___|___| partners

VIOLENCE AND VICTIMIZATION

42. People can be physically aggressive in many ways, for example, pushing, punching, or slapping, or physically aggressive in some other way. What is the most physically aggressive thing done to you during the last 2 years by someone who was or had been in a close romantic relationship with you (such as a wife, husband, boyfriend, girlfriend)? [checklist: push, shove, grab, slap, punch, kick, beat up, throw something at you, hit you with an object, threaten you, threaten you with a weapon, use a weapon, other]
DO NOT INCLUDE SEXUAL ASSAULT OR RAPE WHICH IS ASKED IN Q. 50A.

(WRITE RESPONSE HERE) _____

IF VOLUNTEERED: IF RESPONDENT SAYS THAT NOTHING LIKE THIS HAS HAPPENED, SKIP TO Q.XX.

43. On a scale of 1 to 10, where 1 is minor aggression and 10 is life-threatening aggression, how would you rate the level of this aggressive act?

1 2 3 4 5 6 7 8 9 10 →

Minor Aggression — Life-threatening Aggression

44. Did you seek medical attention from a doctor, nurse, paramedic or other health professional either at the time that the person did this to you or in the next day or so?

Yes	1
No	2

N45A. Had the other person been drinking at the time of the incident?

Yes	1
No	2
Don't know	9

N45B. Had you been drinking at the time of the incident?

Yes	1
No	2

N1. As I mentioned in the preceding questions on physical aggression with a partner, people can be physically aggressive in many ways, for example, pushing, punching, slapping, or physically aggressive in some other way. What is the MOST PHYSICALLY AGGRESSIVE thing done to you during the LAST TWO YEARS by someone who was NOT in a close romantic relationship with you? DO NOT INCLUDE SEXUAL ASSAULT OR RAPE WHICH IS ASKED IN Q. 50A.

(WRITE RESPONSE HERE) _____

N2. On a scale of 1 to 10, where 1 is minor aggression and 10 is life-threatening aggression, how would you rate the level of this aggressive act?

1 2 3 4 5 6 7 8 9 10

Minor Aggression → Life-threatening Aggression

N3. Was this person male or female?

N4. Did you seek medical attention from a doctor, nurse, paramedic or other health professional either at the time that the person did this to you or in the next day or so?

Yes	1
No	2

N5. Had the other person been drinking at the time of the incident?

Yes	1
No	2
Don't know	9

N6. Had you been drinking at the time of the incident?

Yes	1
No	2

N8. How many other people were involved in the incident besides you and the other person?

_____ *(GIVE NUMBER)*

HEALTH AND LIFESTYLE

Now I would like to ask you some questions about your and your family health.

51. How tall are you?

|___|___|___| cm OR |___| feet |___|___| inches

52. How much do you weigh?

|___|___|___| kg OR |___|___|___| pounds

H1. How many times in the past 12 months have you been involved in a road traffic accident, either in a car, motorcycle or as pedestrian?

Never	1
Once	2
More than once	3

H2. Did you seek medical attention from a doctor, nurse, paramedic or other health professional because of the traffic accident?

Yes	1
No	2

H3. How many times in the past 12m have you been involved in a fall?

Never	1
Once	2
More than once	3

H4. Did you seek medical attention from a doctor, nurse, paramedic or other health professional because of the fall?

Yes	1
No	2

H5. How many times in the past 12 months have you been involved in a workplace accident?

Never	1
Once	2
More than once	3
Did not work the past 12 months	4

H6. Did you seek medical attention from a doctor, nurse, paramedic or other health professional because of the workplace accident?

Yes	1
No	2

Coronary heart disease and angina pectoris

H7. Has any doctor or health professional ever told you that you had a heart disease?

Yes	1
No	2

H8. Do you ever have any pain or discomfort in your chest?

Yes	1
No	2

H9. When you walk at an ordinary pace on the level does this produce the pain?

Yes	1
No	2
Unable to walk	3

H10. When you walk uphill or hurry, does this produce the pain?

Yes	1
No	2
Unable to walk uphill or hurry	3

Stroke

H11. Has any doctor or health professional ever told you that you had a stroke?

Yes	1
No	2

Mortality

Now think of your father.

H12. In which year was he born? *INTERVIEWER, PLEASE FILL OUT WHATEVER THE PERSON RESPONDS FIRST. IF RESPONDENT CANNOT GIVE EXACT DATE, PLEASE ASK ABOUT A TIME INTERVAL.*

Born 19__
Or between 19__ and 19__, if the person cannot remember one year

H13. Is your father still alive?

Yes	1
No	2
Do not know	3

H14. If he's alive, how old is he today?:

Age __ years old
Or Between __ and __ years old

H15. If not alive, when did he die? *INTERVIEWER, IF RESPONDENT CANNOT GIVE EXACT DATE, PLEASE ASK ABOUT A TIME INTERVAL.*

Born 19__
Or between 19__ and 19__, if the person cannot remember one year

H16. When you think back of him, how often did he usually have any kind of beverage containing alcohol – whether it was wine, beer, liquor *(OR OTHER CULTURALLY UNIQUE DRINKS THAT MIGHT NOT BE RECOGNIZABLE TO THE RESPONDENT WITHOUT SPECIFYING THE COLLOQUIAL NAME),* or any other drink?

Daily or almost daily
weekly
monthly
occasionally
once or twice a year
not at all/ never, DK

H17. On those days when he had any kind of beverage containing alcohol, how many drinks did he usually have per day?

|___|___| drinks *(OR ANSWERED IN THE RESPONDENT'S TERMS AND POSTCODED TO THE GRAM RANGES IN Q. 25A2-A7)*

H18. How often did he have 5 and more drinks in a sitting?

Daily or almost daily
weekly
monthly
occasionally
once or twice a year
not at all/ never, DK

48. Before you were 16 years old (age 15 or younger), did someone in your family try to make you do sexual things or watch sexual things?

Very often	5
Often	4
Sometimes	3
Rarely	2
Never	1

49. Before you were 16 years old (age 15 or younger), did someone other than a family member try to make you do sexual things or watch sexual things?

Very often	5
Often	4
Sometimes	3
Rarely	2
Never	1

50A. Since the age of 16 (16 or older), was there a time when someone forced you to have sexual activity that you really did not want? This might have been intercourse or other forms of sexual activity, and might have happened with spouses, lovers, or friends, as well as with more distant persons and strangers.

Yes	1 *(ASK Q. 50B)*
No	2 *(SKIP TO Q. 51)*

50B. Was this with a spouse, partner, or someone you had a close romantic relationship with?

Yes	1
No	2

53. In general, how has your physical health been in the last 12 months?

Excellent	5
Very good	4
Good	3
Fair	2
Poor	1

54. In general, how has your emotional/mental health been in the last 12 months?

Excellent	5
Very good	4
Good	3
Fair	2
Poor	1

55. In the last 12 months, have you sought medical or other professional help related to your physical health?

Yes	1
No	2

56. In the last 12 months, have you sought medical or other professional help related to your emotional/ mental health?

Yes	1
No	2

57A. Did you ever consider seeking help for your own drinking or alcohol-related problems?

Yes	1 *(ASK Q. 57B)*
No	2 *(SKIP TO Q. 58)*

57B. If yes, did you receive help in the last 12 months?

Yes	1
No	2

T1. Haver you ever smoked more than 20 cigarettes in your life?

Yes	1
No	2

T2. In yes, do you currently smoke?

Yes	1
No	2

T3. If yes, how many cigarettes do you usually smoke per day?

Number of cigarettes, and one category: only occasionally

59. In the last 12 months, have you used marijuana (pot or hashish)?

Yes	1
No	2

60. In the last 12 months, have you used any other drugs, such as cocaine or crack, heroin, stimulants (such as methamphetamines or "ice"), hallucinogens (such as LSD), or party drugs (such as ecstasy)?

Yes	1
No	2

Appendix 2: GENACIS Survey overview

Country	Principal Investigator	N	Weighted N
Argentina	Dr. Myriam Munne mymu@hotmail.com	N = 1000 M = 402 (40.2%) W = 598 (59.8%)	N = 1000 M = 445.6 (44.56%) W = 554.4 (55.44%)
Belize	Dr. Claudina Cayetano elincaye@btl.net	N = 3985 M = 2074 (47.9%) W = 1911 (52.1%)	N = 4778 M = 2282 (47.8%) W = 2496 (52.2%)
Brazil I	Dr. Florence Kerr Correa correaf@fmb.unesp.br	N = 2083 M = 867 (41.62%) W = 1216 (58.438%)	N = 2083 M= 867 (41.62%) W = 1216 (58.438%)
Brazil II	Ronaldo Laranjeira laranjeira@dpsiq.epm.br	N = 2346 M = 950 (40.5%) W = 1396 (59.5%)	N = 121980000 M = 58078015 (47.6%) W = 63905926 (52.4%)
Canada	Dr. Kathryn Graham kgraham@uwo.ca	N = 14063 M = 6009 (42.73%) W = 8054 (57.27%)	N = 14063 M = 5990.6 (42.60%) W = 8072.4 (57.40%)
Costa Rica	Dr. Juliano Bejarano julio.bejarano@gmail.com	N = 1273 M = 416 (32.68%) W = 857 (67.32%)	N = 1274 M = 630 (49.45%) W = 644 (50.55%)
Mexico	Dr. Martha Romero Mendoza romerom@imp.edu.mx	N = 5711 M = 2382 (41.71%) W = 3329 (58.29%)	N = 5711 M = 2375 (41.60%) W = 3335 (58.40%)
Nicaragua	Dr. Trinidad Caldera trinidad.caldera@psychiat.umu.se	N = 2030 M = 614 (30.25%) W = 1416 (69.75%)	N = 2030 M = 614 (30.25%) W = 1416 (69.75%)
Peru	Dr. Marina Piazza Ferrand mpiazza@upch.edu.pe	N = 1531 M = 516 (33.70%) W = 1015 (66.30%)	N = 319373 M = 107444 (33.6%) W = 211929 (66.4%)
Uruguay	Dr. Raquel Magri magri.raquel@gmail.com	N = 1000 M = 376 (37.60%) W = 624 (62.40%)	N = 1000 M = 376 (37.60%) W = 624 (62.40%)
USA	Dr. Thomas K. Greenfield tgreenfield@arg.org	N = 4920 M = 2219 (45.10%) W = 2702 (54.90%)	N = 4923 M = 2366 (48.06%) W = 2557 (51.94%)