

**The World Health Organization's Global Alcohol Database: Opportunities for research and support for policy.**

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Louis Gliksman<sup>1</sup> and Margaret Rylett<sup>2</sup>

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**Abstract**

Since its inception in 1997, the Global Alcohol Database (GAD) has undergone several iterations and brings together information on a number of topics across countries: alcohol and health situations; consequences of alcohol consumption; trends in alcohol use and related mortality; alcohol production; trade; health effects; and national alcohol control measures and policies. Efforts have been made to make this database compatible with the World Health Organization (WHO) International Guide for Monitoring Alcohol Consumption and Related Harm. A set of indicators was chosen that assesses the most important aspects of the alcohol situation in WHO Member States as they relate to public health. The indicators are grouped into seven broad categories: Alcohol production and availability; Levels of consumption; Patterns of consumption; Harms and consequences; Economic aspects; Alcohol control policies; and Prevention, treatment and drinking guidelines. Contents of the GAD are available on the WHO's Global Information on Alcohol and Health website.

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<sup>1</sup> Centre for Addiction and Mental Health, Toronto, Canada. Louis\_Gliksman@camh.net.

<sup>2</sup> Centre for Addiction and Mental Health, London, Canada. Margaret\_Rylett@camh.net.

## **Introduction**

In 1980, the World Health Organization (WHO) and the Addiction Research Foundation (Canada), with the help of contributors from more than 80 countries in the six WHO regions, published a review of alcohol-related prevention measures, policies and programs (Moser, 1980). This, and other WHO actions, led to a World Health Assembly resolution in 1983 (EB71/1983/REC/1,5) calling on Member States Member States to formulate explicit and comprehensive national alcohol policies with prevention as a priority, and to develop mechanisms to coordinate programs and activities for reducing alcohol consumption and alcohol-related problems on a planned, continuous and long-term basis. Notwithstanding this resolution, it has been difficult for the WHO to maintain and sustain attention to alcohol. Between 1983 and 1990 the focus on alcohol was mainly on “alcohol and causalities, an alcohol education trial, and the initiation of a project on biological markers of alcohol use and dependence” (Room, 2005:149). In 1990, “an ambitious Strategy Document (was set out) that outlined a number of areas for programmatic action” (Room, 2005:149). As a result, in 1996, the WHO Substance Abuse Department began two initiatives: (1) a project aimed at “examining and summarizing the scientific base for and experience with alcohol policies in developing society contexts” (Riley and Marshall, 1999; Babor et al, 2003), and (2) the development of a database to bring together information on the alcohol and health situation in individual countries.

There is clearly a need for this kind of comprehensive data. Alcohol policy is being made or not made by default, generally without the benefit of science. As science mounts to support certain policies and to refute other policies, these need to be promoted. While recorded alcohol consumption among adults has fallen steadily in most developed countries since 1980, it has risen steadily in the developing countries and countries of the former Soviet Union. The rise in alcohol consumption in developing countries provides ample cause for concern over the possible

matching rise in alcohol-related problems in those regions of the world most at risk (World Health Organization, 1999). According to Rehm and Eschmann (2002:48-58), “alcohol is the leading risk factor for disease burden in low mortality developing countries and the third largest risk factor in developed countries”. The *Global Burden of Disease* study, sponsored by the World Health Organization (WHO) and the World Bank, puts alcohol's global health impact on a par with unsafe sex in terms of its contribution to the total number of years of life lost to death and disability as recorded in Disability Adjusted Life Years (DALYs) (Ezzati, Lopez, Rodgers & Murray, 2004). In addition to chronic diseases that may affect drinkers after many years of heavy use, alcohol contributes to acute outcomes that kill or disable at a relatively young age, resulting in the loss of many years of life to death or disability. However, until the *Global Burden of Disease was published in 2004*, there had been no systematic global analysis of the epidemiology of alcohol use and related harm (Ezzati et al., 2004). The resolution on alcohol adopted in May, 2005 by the World Health Assembly (WHA 58-26) generated renewed interest and activity in this area.

Given alcohol's significance to world health, the WHO recognized the need to provide policy makers and health professionals with adequate epidemiological information. An important task for WHO is to stimulate and develop data on the epidemiology of alcohol use and to fill major gaps in knowledge, particularly with respect to developing countries. WHO therefore tries to distil information on the best evidence on alcohol consumption and related harm and provides technical assistance to Member States in collecting their own data and monitoring trends. Several projects and documents support these purposes: the Global Information System on Alcohol and Health; the Global Status Report on Alcohol, the Global Status Report on Alcohol Policy and the International Guide for Monitoring Alcohol Consumption and Related Harm. The Global

Information System on Alcohol and Health, which utilizes the Global Alcohol Database as its source of information is a potential resource for research, planning and the development and assessment of Global Alcohol Policies and is the subject of this article.

## **Background**

In 1996, Dr. David Jernigan at the Marin Institute for the Prevention of Alcohol and Other Drug Problems took on the responsibility for developing the comprehensive database on alcohol and, thus, the Global Alcohol Database (GAD) was born. As well as amassing information on the alcohol consumption and health effects in individual countries, information was also collected on alcohol production, trade, consumption, national alcohol control measures, policies and programs. This was the first time such global surveillance had been attempted, and the findings revealed the shortcomings of global alcohol epidemiology. Estimates of per capita alcohol consumption, where they existed, had generally come from alcohol industry sources rather than health authorities, which often do not have the resources to monitor alcohol use. Although studies of drinking patterns and behaviour had been conducted in some countries, the lack of a global consensus on survey questions, time frames and definitions of terms such as heavy drinking rendered the data inconsistent, difficult to interpret, and not comparable cross-nationally. Data on the consequences of alcohol use either did not exist, due to the failure to define alcohol as a problem and to devote resources to measuring its impact, or lay hidden in statistics for harms, such as motor vehicle-related trauma, interpersonal violence, suicide, and chronic disease, to which alcohol is a substantial contributing factor. Much of the data on drinking and its consequences were weak, relied on small surveys or were anecdotal or were descriptive accounts. In some countries, where drinking patterns would suggest that alcohol takes a heavy toll on health, no data existed on the magnitude of the toll. For some populations,

production of alcohol and drinking itself are illicit activities. Here alcohol consumption cannot be measured, but only estimated. In countries with substantial informal economies, much of the domestic production of alcohol, whether legal or illegal, may go unrecorded. The Global Alcohol Database could not correct these problems, but did allow for them to be recognized.

The first Global Status Report on Alcohol (World Health Organization, 1999) was largely based on the Global Alcohol Database. The report, modeled on WHO's earlier Global Status Report on Tobacco or Health, sought to document what is known about alcohol's impact on health worldwide, what was being done by national governments to ameliorate that harm, and what was needed on a global basis to prevent and reduce alcohol-related injury and disease. Part I of the report presented comparative analyses of the alcohol situation on a regional and global basis, including comparisons of individual countries using indicators such as alcohol use, mortality trends, production and trade, as well as a summary of existing control policies. Part II presented individual country profiles, bringing together information on each of these indicators with a description of alcohol control measures for each Member State for which data were available.

Around this time the Swiss Institute for the Prevention of Alcohol and Drug Problems assumed responsibility for the GAD. The database was expanded and updated during this period, adding more information on the harms caused by alcohol abuse and alcohol consumption. In addition, prevalence data were placed on the WHO "WHOSIS" website. A more recent version of the Global Status Report on Alcohol (2004) was prepared and published. In addition, a global survey to determine the extent of Alcohol Policy formulation and content was conducted for the first time. The information collected was added to the GAD and published in the Global Status Report on Alcohol Policy 2004. The Global Status Reports are snapshots of the state of world

health related to alcohol. The evidence they provide regarding alcohol's importance to health will hopefully stimulate further efforts to document alcohol use, problems and policies in WHO Member States. In 2005 the responsibility for the GAD was transferred to the Centre for Addiction and Mental Health, located in Toronto, Canada.

### **The Global Alcohol Database**

Although adult per capita alcohol consumption estimates may provide evidence of long-term trends, they tell us little about actual drinking in the population. A clear picture of who is drinking, how often and how much they drink may generally emerge only from data collected through population surveys of drinking. Different drinking patterns give rise to very different health outcomes in different population groups. Both quantity and frequency are crucial variables in determining health risks. Having fourteen drinks at one sitting once per week carries very different health risks from having two drinks a day every day for a week, yet both may appear to be identical drinking patterns when viewed as a weekly average. In practice, many developed countries have been able to perform annual or periodic household or other national surveys to ascertain both quantity and frequency, and have developed scales that incorporate both. Through surveillance of the published literature, available WHO documents and other North American and European collections, and in consultation with regional experts and WHO regional offices, more than 2200 surveys of alcohol use have been the source of data for the Global Information System on Alcohol and Health, describing patterns of use in more than 225 countries.

For inclusion in the database, surveys were deemed acceptable for comparison if they were for randomly sampled national populations, or if they sampled substantial regional populations. For example, particularly in large ethnically diverse developing nations, such as Nigeria, regional samples may not be representative of the entire population, but were included

in the absence of any national data. Samples of more than one thousand persons were preferred, and priority was given to the most recent data. In addition, large international databases maintained by other international governmental or non-governmental organizations, and personal communications from experts in the WHO Member States have been utilized.

Within the Global Alcohol Database, itself, the data are arranged under a broad set of seven categories that contain a number of indicators that were chosen to assess the alcohol situation in WHO Member States as they relate to public health. These seven categories are: alcohol production and availability; levels of consumption; patterns of consumption; harms and consequences; economic aspects; alcohol control policies; and resources for prevention and treatment. These indicators, individually and collectively, provide opportunities for research and support for policy. Each category will be discussed with reference to the indicators contained within it, data sources utilized and other relevant information pertinent to any calculations, in addition to caveats that users should consider.

### *1. Alcohol production and availability*

Alcohol production and trade data from a variety of sources are provided. Data published in World Drink Trends (Productschap voor Gedistilleerde Dranken) by the Commodity Board for the Dutch Distilled Spirits Industry were consulted. Available data on alcohol production and trade were obtained from the Food and Agricultural Organization of the United Nations statistical database (FAOSTAT). In addition, the estimates published here drew on sources covering individual countries or data sets provided by national governments. Company annual reports and publications serving the alcohol industry, as well as key informants in WHO Member States, were also consulted. Data on traditional beverages came from literature searches.

## *2. Levels of consumption*

Reporting per capita alcohol consumption for the entire population will underestimate adult alcohol consumption in countries where a comparatively large proportion of the population are children. Therefore, the estimated amount of pure ethanol in litres of total alcohol is provided, separately for beer, wine and spirits consumed per adult (15 years and older) in the country during the calendar year, as calculated from official statistics on production, sales, import and export, taking into account stocks whenever possible. Per capita alcohol consumption estimates, however, cannot reflect population drinking patterns, although research done primarily in developed countries has found per capita alcohol consumption to be a fairly reliable proxy for heavy drinking in a population (Edwards et al., 1995). Data are collected and calculations are made mainly using three principal sources: national government data, data from international organizations and alcohol industry data. National government data is often the most reliable source for this type of statistics. FAOSTAT - United Nations Food and Agriculture Organization's Statistical Database is the most complete and comprehensive international source, and World Drink Trends, regularly published by Produktschap voor Gedistilleerde Dranken (Netherlands) is the best source for industry data (Rehm, Rehn, Room, Monteiro, Gmel, Jernigan & Frick, 2003:152-153). Since these sources use different conversion factors to estimate alcohol content, the separate alcohol content for beer, wine and spirits, in some cases, may not equal the total provided. When FAOSTAT data are used, a series of calculations must be made to first estimate the alcohol content of the various grains, and then to compile adult per capita consumption based on the population. Conversion factors used to estimate amount of pure alcohol in (barley) beer is 5.0%, wine 12% and spirits 40% of alcohol (other conversion factors were used for some types of beer and other beverages).

The algorithm, or decision tree, for determining which data to use for adult per capita consumption when multiple sources of data are available is as follows: for all countries which are "high income" in the World Bank classification, and where World Drink Trends (WDT) data are available, WDT estimates are used; for all countries where World Drink Trends has used national government statistics, domestic alcohol industry statistics, or supplemented FAO information with additional sources, WDT estimates are used; for other countries, data calculated from the FAO are used, and, if a government from a specific country provides estimates based on written documentation, both FAO and WDT data are replaced with the government data. This decision tree assumes the following hierarchy of reliability (from most reliable to least reliable): Government statistics from the country itself; alcohol industry statistics from the country itself; FAO, and alcohol industry statistics from global sources.

Unrecorded adult (15+) consumption estimates are also provided. Since consumption of illegally produced or obtained alcohol is not "officially" recorded, it is necessary to rely on literature accounts and personal communication from local and regional experts to collect estimates of these amounts. Then, adult (15+) per capita consumption is calculated. Since it is probable that those younger than 15 years of age consume some of the product illegally, unrecorded adult per capita estimates may be overestimated to a certain extent. The source of the population estimates for adult per capita calculations is the United Nations population database.

### *3. Patterns of consumption*

This category includes data on prevalence of alcohol use (quantity and frequency) in specific population subgroups. As well, information is available on drinking contexts and the pattern of drinking scores for many countries. Patterns of drinking scores (Rehm, Gmel, Room, & Frick, 2001; Rehm, Rehn, Room, Monteiro, Gmel, Jernigan & Frick, 2003; Rehm et al, 2006)

are an attempt to quantify both dimensions of alcohol consumption with regard to the risk relations of alcohol to different categories of morbidity and mortality on a country or regional level. Variables used in making this calculation are: heavy drinking occasions, daily drinking, frequency of getting drunk, usual quantity per drinking session, feast/holiday binge drinking, drinking with meals and drinking in public places. Points were assigned on the basis of certain responses for each variable and aggregated to amass a score from 0 to 17 points based on the optimal scaling of ratings of key experts. These scores were then aggregated to give a “patterns of drinking” score. Specifically, the following algorithm was used: 10-17 points = a pattern value of 4; 7-9 points = a pattern value of 3; 4-6 points = a pattern value of 2; and 0 to 3 points = a pattern value of 1. The “patterns of drinking” scores range from 1 to 4, with “1” being the least risky drinking pattern and “4” being the most risky the drinking pattern (Rehm et al, 2003:155). These data were obtained from reviews of published studies in scientific publications, from conference reports and related documents, and from WHO Member States. Estimates of the prevalence of alcohol use may be combined with per capita alcohol estimates to provide a more realistic view of how much alcohol drinkers are consuming.

#### *4. Harms and consequences.*

Indicators are divided into topics and sub-topics as they relate to acute and chronic harms and consequences associated with alcohol abuse. Topics include: mortality; mental and behavioural disorders; other disorders related to alcohol use (e.g., alcohol-related pancreas disease, gastric disorders, cardiovascular disorders); injuries; traffic; violence; legal aspects; workplace, and psycho-social problems. For mortality, age standardized rates are provided (SDRs and DALYs) for a number of non-communicable diseases, and intentional and unintentional injuries. At this time, alcohol-attributable fractions are not available on the website

for these particular data. It is intended to add these fractions in the future. For countries in the WHO European Region, data published in the Health for All Database were consulted. Data were also obtained for alcohol-attributable and alcohol-involved mortality from both the WHO Global Program on Evidence and Information for Health Policy and the Pan American Health Organization (PAHO) Technical Information System. Additional data came from WHO Member States, WHO regional offices, conference reports, related documents, and published studies in scientific journals. Data are cited from articles and are not necessarily standardized. Standardized data were mainly obtained from the WHO INFObase accessible at the website <http://www.who.int/healthinfo/bod/en/index.html>, and provided by the Department of Measurement and Health Information.

#### *5. Economic Aspects*

The indicators here include data on revenues from excise taxes and custom duties, and the percent of those employed in the alcohol industry. As well, indicators are provided for the per capita expenditure on alcohol, the percent of household expenditure on alcohol, the cost to the economy of alcohol problems in the workplace, providing alcohol programs and of alcohol consumption in general. Information was obtained from published articles and reviews in the scientific and industry literature, and from the popular and business press.

#### *6. Alcohol control policies*

This category includes legislation and alcohol control activities in each country. Indicators such as: National Policy status, Blood Alcohol Concentration regulations, regulations on advertising, sponsorship, sales promotion, product labelling. Much of this information was provided directly by WHO Member States and key informants through responses to the Alcohol Policy Survey in 2002 with a follow-up to non-respondents in 2005.

## 7. Prevention and treatment

Information under this category pertains to treatment and prevention agencies, social programmes, public education and prevention activities, treatment services, support for families and drinking guidelines. Information was obtained from government sources, conference documents and WHO Member States and key informants.

The Global Alcohol Database is currently overseen by a Steering Committee comprised of representatives from the World Health Organization's Department of Mental Health and Substance Abuse, the Centre for Addiction and Mental Health (Canada) and the Addiction Research Institute (Zurich), and is continuously being updated. It has been reorganized to make it more compatible with the *International Guide for Monitoring Alcohol Consumption and Related Harm*. To date, the GAD has been utilized in the preparation of the Global Status Reports on Alcohol (1999; 2004), Global Status Reports on Alcohol Policy (2004), Global Status Report on: Alcohol and Young People (2001), and the Global Burden of Disease (2004). Many other reports and articles have been generated based on these published sources. Two examples of these are: *Comparative Analysis of Alcohol Control Policies in 30 Countries* (Brand, Saisana, Rynn, Pennoni, and Lowenfels (2007) and *Average Volume of Alcohol Consumption, Drinking Patterns and Related Burden of Mortality in Young People in Established Market Economies of Europe* (Rehm, Gmel, Room and Frick, 2001).

### **The Global Information System on Alcohol and Health**

During 2007, a more user-friendly and comprehensive website, *the Global Information System on Alcohol and Health (GISAH)*<sup>3</sup>, was developed to display much of the database information ([www.who.int/globalatlas](http://www.who.int/globalatlas)). The format of the Global Alcohol Database is duplicated on the GISAH website, and users are able to choose topics and sub-topics according to their

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<sup>3</sup> Please note that this website is still under construction.

interests. Not all possible indicators present in the GAD are displayed on the website for various reasons. However, there are currently more than 200 alcohol-related indicators displayed. Over time, new indicators will be added. A *Query* option has been provided so that users can contact the site manager directly for data they are unable to locate ([www.gisah.int](http://www.gisah.int)). Another feature of this website is that it allows users to map and graph the data, as well as download data to EXCEL files. Examples of the mapping and graphing capability of this site are presented in Figures 1 and 2.

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Insert Figure 1 and 2 about here.

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Links have been provided to GISAH from each of the WHO Regions websites (where requested) in order to facilitate access to alcohol information pertaining to their Member States. As well, links are provided from GISAH to facilitate access to recent reports on the state of the world health related to alcohol.

### **Future Development Plans**

Current limitations on the availability and standardization of data provide us with many opportunities to improve this website over time. In order to maintain *the Global Information System on Alcohol and Health* website as a dynamic source of alcohol information at the Global level, plans have been made to address a number of on-going issues. For example, measures of dependence are more difficult to present since a variety of different instruments are used (e.g., AUDIT, CAGE, DSM-IV). At present, treatment admissions, and hospital discharge rates are available for both alcohol dependence and alcohol psychosis. As we resolve the best way to present actual measures of dependence, they will be incorporated into the website. To ensure more valid comparisons of national trends, standardized data should be utilized. To meet this

need, efforts will be made to provide more standardized data on *the Global Information System on Alcohol and Health* over time. To support more valid comparisons, WHO Regional Centres have been presented with a list of preferred indicators on alcohol use and harm and have been asked to help collect these national data in a more efficient manner.

Of interest to decision-makers, a *Global Alcohol Survey on Policy and Health* is planned for 2007/8. This iteration of the questionnaire has been expanded to include more data on production, imports and exports, a request for the provision of government statistics, and a more precise list of health indicators related to alcohol consumption that are monitored in each country. This survey will culminate in the production of the Global Status of Alcohol Policy report in 2009. Additionally, as reports become available that present data by WHO region and for the World, these data will be introduced to the website for wider utilization.

### **Challenges**

Making these data available to the widest possible audience by displaying it on *the Global Information System on Health and Alcohol* has presented some unexpected challenges. Notably, there is no system that allows for the simultaneous presentation of data sources for the numeric data. Our remedy has been to provide a separate text file containing this information, “Sources for numeric data”. While *GISAH* users may cite the database as the source of the information they retrieve, it is prudent to check the original source of the information to verify the validity and reliability of the information. Similarly, when there are several sources available (e.g., for per capita consumption data), it is important that those using this information are aware of both the algorithm for choosing the source and the actual source of this data. Information about the criteria for selection of the various data is contained in separate text files under each

topic or sub-topic (e.g., “About patterns of consumption”). These files should be reviewed prior to utilizing the data.

Another challenge is the fact that data from some countries represent only regional information (e.g., Canada) and there is no way of using a numeric format to denote this. Where possible, these data are presented in a text format where “regional” can be noted (e.g., alcohol dependence). Presenting certain data in a text format allows for the display of information for certain countries where standardized data and other rates of harm are not available. As well, the option of providing country data in both numeric and text format allows for more information to be made available to a wider audience, especially as it relates to policy priorities, and future directions for policy and prevention activities.

## **Summary**

The Global Information System on Alcohol and Health represents a concerted effort to pull together in one place much of the world’s knowledge about alcohol consumption, prevalence and harm. It is not, however, a complete source of all possible data. In summary, despite its relatively young age, these sources represent important tools for researchers, planners and decision-makers. They embody one comprehensive source of information vital to those seeking to develop, modify or improve policy and those wishing to research the burden alcohol abuse places on regional, national and global resources.

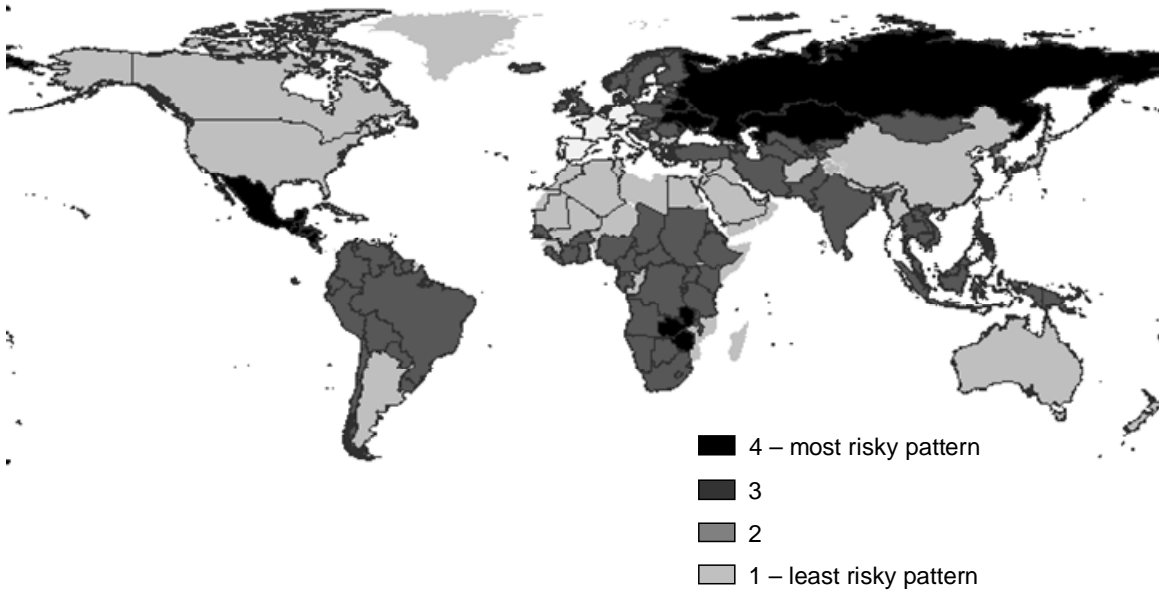
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*EB122/10 and EB122.R2.*

**Figure 1**  
**Patterns of Drinking Scores, 2002**



**Figure 2 Road Traffic Accidents Involving Alcohol,  
Rate per 100,000 Iceland 1998 - 2003**

