Global Status Report On Alcohol

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Abstract

The global burden of disease from alcohol exceeds that of tobacco and is on a par with the burden attributable to unsafe sex worldwide. To provide a global picture of the status of alcohol as a factor in world health, the report begins with an overview describing the types of alcohol available around the world and summarizing data and trends in recorded and unrecorded alcohol production and adult per capita consumption of alcohol. Prevalence of drinking and drinking patterns in the WHO regions and among key sub-populations such as men, women and young people are described. The overview provides statistics on the leading national producers, importers and exporters of alcohol, and describes the changing organization of alcohol production and trends toward globalized alcohol commodities heavily supported by marketing. A discussion of alcohol's possible protective effects is followed by statistics on chronic and acute consequences of alcohol use, including alcohol dependence, chronic liver disease and cirrhosis, motor vehicle crash deaths, and injuries from violence. Social costs and benefits from alcohol use, such as tax revenues, are also discussed. In keeping with WHA resolutions calling for comprehensive national alcohol programmes, the status and importance of national implementation of various alcohol policies are described, including education and health promotion, regulation of physical availability, taxation, product labeling, regulation of promotion, and deterrent strategies. A conclusion reiterates the importance of national programmes and policies for preventing a global epidemic of alcohol-related harm.

Following the overview are country profiles for all Member States for which sufficient data were available. These profiles include information about alcohol use, including trends in adult per capita consumption as well as prevalence data; health and social problems, including morbidity and mortality from alcohol-related causes; policies designed to control alcohol products and problems; and data collection, research and treatment activities.

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Foreword

On behalf of the Substance Abuse Department of the World Health Organization, I am pleased to present this Global Status Report on Alcohol. This volume is the culmination of over four years of dedicated work by WHO HQ, the Marin Institute in California, USA, in consultation with a large number of consultants, researchers, and all the WHO Regional Offices.

The genesis of this work was the growing recognition of the significant contribution of alcohol to the global burden of illness, disability and death. In 1990, WHO estimated that alcohol accounted for 3.5 percent of the total of all Disability Adjusted Life Years (DALY) lost to disease and disability in the world. Both developed and developing countries are affected by this burden. This figure is however, most likely a gross underestimate of the true burden of alcohol to society. Although an attempt was made to estimate the indirect health effects such as disability and death from domestic violence, aggravated assault, motor vehicle accidents, suicide, and boating accidents where alcohol is thought to have played a part, these were only roughly estimated. The true estimation of the adverse health, social and economic costs of excessive alcohol consumption has yet to be calculated.

Although recorded alcohol consumption has fallen since 1980 in most developed countries, it has risen steadily in developing countries and in the countries of the former Soviet Union. Male life expectancy has actually declined in the Russian Federation and this can be linked at least in part to rapid increases in unrecorded alcohol consumption since the collapse of the Soviet Union. The rise in alcohol consumption in these and other developing nations where health and economic systems are weakest, is of great concern to WHO.

Despite the wealth of information presented in this Report much more information is needed. Countries frequently have very limited data on actual alcohol consumption, on patterns of use and on problems specifically related to specialized patterns of drinking. Additionally, we know that the measures used to estimate alcohol consumption and related harm are not satisfactory, such as those that try to estimate unrecorded production and consumption (from smuggling, illicit production, home production) or alcohol related violence and crime. I hope that recognition of these weaknesses will encourage all Member States to work even more closely with WHO to collect more and better data.

No volume describing the adverse health effects of alcohol can be presented without clarifying the beneficial effect that use of alcohol at low levels may have for some segments of the population. Research over the past decade, primarily in developed countries, has shown that for some adults at high risk of coronary heart disease and stroke, small amounts of alcohol can lower the overall risk from these disorders. The lower limit has yet to be firmly established but some research has shown that the full benefit can be achieved with as little as one drink per week. It must be noted that this beneficial effect pertains only to those at high risk in a certain age range, e.g., men over forty-five years of age and post menopausal women in countries where there is a high prevalence of these disorders, e.g., mainly developed countries, as these disorders are not prevalent in most developing countries. This beneficial effect does not apply to the general population and consumption of larger quantities of alcohol by those at high risk of these disorders can actually increase their risk.

The publication of this Report marks the formal beginning of WHO's new Global Alcohol Initiative which is a comprehensive effort to conduct and synthesize research, distil information based on the best available evidence, and provide technical assistance and policy guidance to Member States. I am confident that this Initiative will form the strategic basis for filling the gaps in our knowledge base. This Global Status Report on Alcohol is the first step in this process and I hope that this volume will be of use to clinicians, researchers, and policy makers throughout the world.

Dr. Mary Jansen
Director, Substance Abuse Department
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Introduction

Alcohol-related death and disability account for even greater costs to life and longevity than those caused by tobacco use, according to the global burden of disease study sponsored by the World Health Organization (WHO) and the World Bank. This study put alcohol's global health impact on a par with unsafe sex and above tobacco 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) (Murray & Lopez, 1996). In addition to chronic diseases that may affect drinkers after many years of heavy use, alcohol contributes to traumatic outcomes that kill or disable at a relatively young age, resulting in the loss of many years of life to death or disability. In terms of mortality, even if allowance is made for alcohol's protective effect against heart disease, net deaths from alcohol totalled more than three-quarters of a million in 1990. Eighty per cent of this excess mortality occurred in the developing regions of the world. According to the global burden of disease study, morbidity from alcohol, measured in years of life lost to disability, has a greater impact on health than even malnutrition or poor sanitation (see Table 1).

Table 1. Global burden of disease and injury attributable to selected risk factors, 1990

RISK FACTOR	DEATHS (THOUSAND)	AS % OF TOTAL DEATHS	YEARS OF LIFE LOST (THOUSANDS)	AS % OF TOTAL YEARS OF LIFE LOST	YEARS OF LIFE DISABLED (THOUSAND)	AS % OF TOTAL YEARS OF LIFE LOST	DISABILITY-ADJUSTED LIFE YEARS (DALYS) (THOUSANDS)	AS % OF TOTAL DALYS
Malnutrition	5 881	11.7	199 486	22.0	20 089	4.2	219 575	15.9
Poor water supply, sanitation and personal hygiene	2 668	5.3	85 520	9.4	7 872	1.7	93 392	6.8
Unsafe sex	1 095	2.2	27 602	3.0	21 100	4.5	48 702	3.5
Tobacco	3 038	6.0	26 217	2.9	9 965	2.1	36 182	2.6
ALCOHOL	774	1.5	19 287	2.1	28 400	6.0	47 687	3.5
Occupation	1 129	2.2	22 493	2.5	15 394	3.3	37 887	2.7
Hypertension	2 918	5.8	17 665	1.9	1 411	0.3	19 076	1.4
Physical inactivity	1 991	3.9	11 353	1.3	2 300	0.5	13 653	1.0
Illicit drugs	100	0.2	2 634	0.3	5 834	1.2	8 467	0.6
Air pollution	568	1.1	5 625	0.6	1 630	0.3	7 254	0.5

Source: Murray & Lopez, 1996

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 decline in male life expectancy in the Russian Federation is a cautionary tale of the health dangers inherent in an alcohol market out of control (Leon et al., 1997; Kauhanen et al., 1997; McKee & Britton, 1998). This is, at least in part, the result of rapid increases in unrecorded (resulting from domestically and/or illicitly produced and sold alcoholic beverages) alcohol consumption since the collapse of the Soviet Union. The rise in alcohol consumption in developing countries provides ample cause for concern over the possible advent of a matching rise in alcohol-related problems in those regions of the world most at risk.

In 1980, 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 programmes (Moser, 1980). However, despite alcohol's importance as a risk factor to world health, there has been no systematic global analysis of the epidemiology of alcohol use and related harm since then. Given alcohol's significance in world health, the Substance Abuse Department of the World Health Organization (WHO/SAB) has prioritized monitoring and providing guidelines for controlling health problems attributable to alcohol. This report, modelled on WHO's earlier *Global Status Report on Tobacco or Health* (WHO, 1997), seeks to document what is known about alcohol's impact on health worldwide, what is being done by national governments to ameliorate that harm, and what is needed on a global basis to prevent and reduce alcohol-related injury and disease.

To create this report, WHO/SAB undertook a major exercise in passive epidemiological surveillance, gathering published and fugitive data and information about key aspects of the alcohol situation in WHO Member States. This is the first time such global surveillance has been attempted, and the findings reveal the shortcomings of global alcohol epidemiology. Estimates of per capita alcohol consumption, where they exist, have heretofore generally come from alcohol industry sources rather than health authorities, who often do not have the resources to monitor alcohol use. Although studies of drinking patterns and behaviour have been conducted in some countries, the lack of a global consensus on survey questions, time frames and definitions of terms such as heavy drinking renders the data inconsistent, difficult to interpret, and not comparable cross-nationally. WHO is currently supporting the development of international guidelines for monitoring alcohol consumption and harm (WHO, unpublished) that in the longer term will improve the quality and comparability of alcohol-related data.

Data on the consequences of alcohol use either do not exist, due to the failure to define alcohol as a problem and devote resources to measuring its impact, or lie hidden in statistics for harms to which alcohol is a substantial contributing factor, such as motor vehicle-related trauma, interpersonal violence, suicide, and chronic disease. Much of the data on drinking and its consequences are weak, relying on small surveys or anecdotal or descriptive accounts. In some countries, where drinking patterns would suggest that alcohol takes a heavy toll on health, no data exist 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 domestic production of alcohol, whether legal or illegal, may go unrecorded. Efforts in this report to adhere to well-documented sources result in the under-estimation of much of this unrecorded alcohol production and consumption.

Thus, the picture this report provides of alcohol consumption and world health is, in many respects, incomplete. The report stands as a picture as much of the state of knowledge as of the state of world health related to alcohol. The evidence it gives regarding alcohol's importance to health will hopefully stimulate further efforts to document alcohol use, problems and policies in WHO Member States.

Part I of this report presents 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 control policies being used. Part II presents 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.

WHO data sources and methods

WHO has established a database providing a standardized reference source of information for global epidemiological surveillance of alcohol use and related problems. The database brings together a large amount of information on the alcohol and health situation in individual countries and, wherever possible, includes trends in alcohol use and related mortality since 1970. WHO has also collected information on alcohol production, trade, consumption, and health effects, as well as on national alcohol control measures, policies and programmes. In addition to large international databases maintained by other international governmental organizations, more than 850 published sources have been identified and consulted.

Indicators were chosen to assess the most important aspects of the alcohol situation in WHO Member States as they relate to public health. For most countries, this report includes data and information on these indicators from the early 1990s. Wherever possible, later data or estimates have been used. The indicators may be grouped into seven broad categories:

1. *The sociodemographic situation.* The indicators include those of specific relevance to the assessment of alcohol use and alcohol-related problems, e.g. population age structure, life expectancy, national wealth, labour force structure and urbanization. For purposes of international comparability, this information was obtained from such sources as the United Nations Department for Economic and Social Information and Policy Analysis, the former WHO Division of Health Situation and Trend Assessment, the United Nations Development Programme, the United Nations Statistical Office, and the World Bank's *World Development Reports*. The population and health status information reported in the country profiles were taken from official estimates and projections published by the United Nations Population Division, except when contradicted by Member State governments themselves in correspondence with the authors of this report.
2. *Alcohol production, trade, and industry.* Data on alcohol production and trade came from several sources. For countries in the WHO European Region, the primary source for estimates of alcohol production were those published in the WHO European Regional Office's Health For All Database. For 24 other countries, data published in *World Drink Trends (Produktschap voor Gistilleerde Dranken, 1997*) by the Commodity Board for the Dutch Distilled Spirits Industry were consulted. All available data on alcohol production and trade were also obtained from the Food and Agricultural Organization of the United Nations (FAO) statistical databases (FAOSTAT) and the United Nations Statistical Office. 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.
3. *Alcohol consumption.* Wherever possible, per capita estimates of alcohol consumption in each country were attempted, based primarily on production and trade data from the sources discussed above. These estimates rarely account for unrecorded consumption of smuggled or home- or informally-produced alcohol. Heavy alcohol consumption by tourists may result in overestimation of national alcohol consumption, just as patterns of frequent overseas or cross-border alcohol consumption may result in underestimation. Stockpiling, routine on the part of producers in the case of fine whiskies and wines, and not uncommon by distributors and retailers facing significant tax increases, can also result in erroneous estimates of per capita alcohol consumption. Per capita alcohol consumption estimates also 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., 1994). Where women drink

very little, or where there are large numbers of abstainers, per capita alcohol consumption estimates will underestimate actual drinking by drinkers. This report provides, where available, estimates of the prevalence of alcohol use, which may be combined with per capita alcohol estimates to provide a more realistic view of how much alcohol drinkers are drinking. Sources such as *World Drink Trends* (*Produktschap voor Gistilfeerde Dranker*, 1997) or the WHO European Regional Office (WHO/EURO) Health for All Database that report 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. This report attempts to correct this by providing estimates for adult per capita alcohol consumption, based on the population aged 15 years and above.

4. *The prevalence of alcohol use*. The indicators include data on prevalence of alcohol use in specific population subgroups such as young people, adults, males and females separately, occupational categories, other demographically defined categories such as racial/ethnic or religious groups, and groups defined by income or place of residence. These data were obtained from reviews of published studies in scientific publications, from conference reports and related documents, and from WHO Member States.
5. *The health effects of alcohol use.* Special emphasis is placed here on mortality due to drinking. 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 Programme 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. Age standardized death rates were calculated using the World Standard Population based on the years 1950 to 1957, the years closest to the years for which data were collected (provided by the WHO Programme on Evidence and Information for Policy).
6. *National policy responses*. These include legislation, education, and the organization of alcohol control activities in each country. Much of this information was provided directly by WHO Member States and key informants. Information was also obtained from published articles and reviews in the scientific and industry literature, and from the popular and business press.

Data and information for the country profiles were assembled from existing reports, publications, and other documents available to WHO. For some indicators, different sources provided inconsistent or conflicting information. A number of sources, including key informants, were then consulted, and decisions made on a case-by-case basis after a thorough analysis of all available data. In the preparation of this report, every attempt was made to include accurate and up-to-date information, available as of mid-1998. Once this basic data collection phase was completed, a set of summary profiles were prepared, supplemented by data and information provided by key informants in each WHO region. The profiles were sent to the WHO regional offices for amendments, validation and clearance, and then subjected to another round of revision, followed by another review by the WHO regional offices.

Despite the efforts made by WHO to obtain and validate data and information, many gaps in, and uncertainties about, the actual alcohol and health situation in WHO Member States remain. WHO therefore encourages comments or additional information from readers of this report, in order to improve the reliability of its global epidemiological surveillance and thereby increase the usefulness of this information in supporting efforts to reduce alcohol-related problems worldwide. Any information, comments or suggestions may be sent directly to: Substance Abuse Department, WHO, 20 Avenue Appia, 1211 Geneva 27, Switzerland.

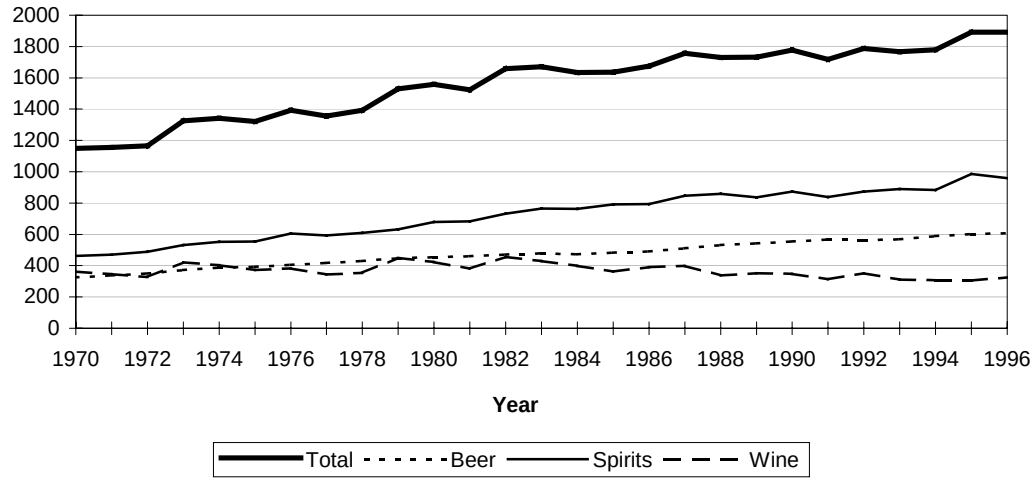
Types of alcohol products

There is an extremely broad range of types of alcohol available around the world. Beverage alcohol has been present in nearly all societies, with the possible exception of certain previously existing societies of Oceania, and North America north of the Mexican border (Hill, 1984). Wine, which generally ranges in strength from 10 to 14 per cent alcohol, and beer, which can range from 0.5 per cent to as high as 14 per cent alcohol, have been present for at least 5000 years. Distilled spirits, which may contain as low as 20 per cent but usually have upwards of 35 per cent pure alcohol, first appeared in European records in the twelfth century. Wine can be made from a wide variety of fruits, and can then be further distilled or combined with other ingredients to create brandies, cognac, cordials and liqueurs. Distilled spirits can also come from a wide range of raw materials, including cane and beet sugars, potatoes, corn, barley, wheat and other grains. Beer is primarily made from barley or sorghum, although other grains are occasionally used and rice is often employed as a starch.

As the end of the twentieth century approaches, the range of alcohol products may be divided into two categories: global commodities and local products.[1] Within these two categories, there is wide variation. The category global commodities encompasses those alcoholic beverages present in international trade. These tend to fall into three primary categories: beer from barley, wine from grapes, and certain distilled spirits. Although ciders and wines from sources other than grapes (e.g. palm wine or *toddy*) are popular in some regions, they do not appear in any quantity in international trade or in the alcohol consumption patterns of more than a few countries.

Data from the Food and Agricultural Organization (FAO) of the United Nations indicate that the production of beverage alcohol worldwide has grown steadily since 1970. However, this growth has not been equivalent across categories. Figure 1 shows that while production of beer and distilled spirits has risen, production of wine has generally fallen. The increase in distilled spirits production is probably even greater than that shown in Figure 1.

Figure 1: Global Production of Alcohol (in thousands of hectolitres of pure alcohol)

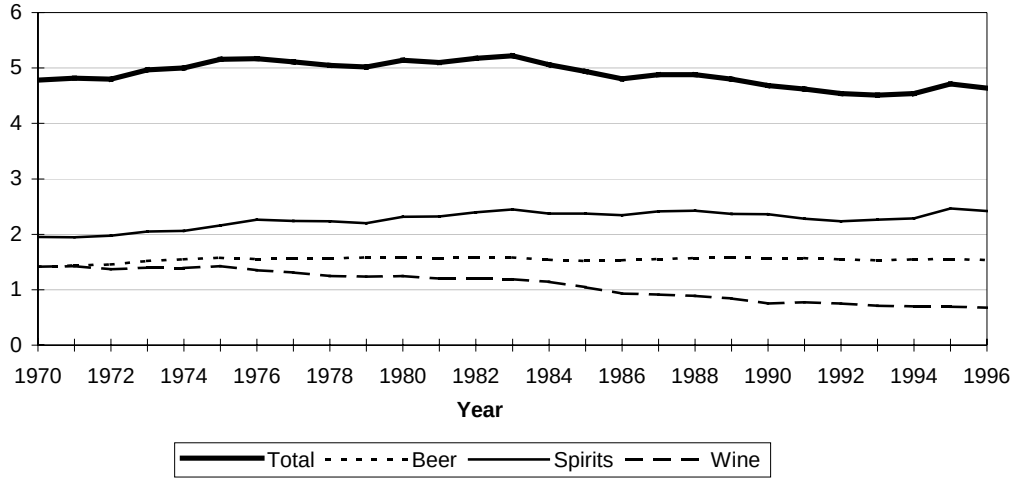


Source: FAO Statistical Databases 1998

[1] Throughout this document, "local products" is used synonymously with the terms home-produced, domestically-produced, and informally-produced alcohol. The consumption of these products is in the main unrecorded.

Analysis of the FAO data at the country level shows that the countries of the former Soviet Union have recorded a dramatic decrease in spirits production. However, such a large decrease is unlikely, and probably reflects a shift in production to illegal spirits production or importation, which would then not appear in recorded production figures.

Figure 2: Alcohol Availability per Adult (age 15+) (in litres of pure alcohol)



Sources: FAO Statistical Databases 1998; Produktschap voor Distilleerde Dranken, 1997; United Nations Population Division 1994.

Alcohol availability expressed as litres absolute of alcohol available per adult aged 15 years and over is a rough proxy measure for adult per capita consumption of alcohol. Figure 2 shows the recorded global availability of alcohol per adult. Availability is calculated as production plus imports and additional stocks, minus exports.

The figure shows that alcohol availability per adult appears to have declined since its peak in 1983. This is, in part, because of the growth in the global population of adults and not because of any overall reduction in global alcohol production. Alcohol consumption has fallen in developed countries. Globally, the availability of spirits has gradually increased, beer has kept up with population growth and wine has lagged behind it.

This report focuses on the three dominant industrial categories or types of alcoholic beverages: beer, distilled spirits and wine. Ciders, *pulque*, *shochu* and other more localized beverages are either not covered in the statistics on which this report is based, or have been included in the other main categories. Wherever possible adjustments or additions have been made to account for these failings in the statistics. However, the focus remains on the three main categories.

Beer

Beer is available in nearly all countries, and much of it comes from transnational producers, their subsidiaries, joint ventures, or local partners. There is a wide range of variations, including low or "no-alcohol" beers (ranging from 0.5 to 2.5 per cent pure alcohol), as well as stronger stouts, ales and other malt-based products that can reach as high as 14 per cent alcohol. Facing intense competition in the mature markets of the developed world, brewers have created a number of variants: ice beer, dry beer, light beer, clear beer, and so on. Most beer is in the range of four to six per cent alcohol, although in countries such as Australia and New Zealand consumption of lower alcohol beers, in the range of 2.5 per cent alcohol, is being encouraged by public health authorities. Modern computerized industrial manufacturing has lowered the costs of producing beer in very large quantities, and advanced brewing technology has spread rapidly around the world, with large new breweries taking advantage of the economies of scale inherent in the manufacturing process.

In sub-Saharan Africa, a tradition of brewing beer from sorghum continues. Such brewing may follow traditional, home or communal methods, but has also been augmented and in some cases replaced by industrial methods of mass-producing beer from sorghum. Since sorghum beer spoils quickly, mass centralized production has relied on the development of modern roadways and methods of transport. Sorghum beer is not normally included in international figures on beer production and trade. Estimates of alcohol consumption in this document reflect the bias towards malt beer of the international sources, but where available, data on sorghum beer have also been included.

Distilled spirits

According to a leading alcohol industry market research firm (Impact Databank, 1995), approximately 54 per cent of distilled spirits worldwide are so-called traditional or local products. Some previously local products have become global commodities, such as Scotch whisky and *tequila* which are now industrially produced and traded internationally. Others are still made with low levels of technology, some of which are traditional to various regions, and some of which (for example the *kachasu* or "kill-me-quick" of Southern Africa) involve the use of whatever "strengthening" agents are available, including battery acid.

Using local agricultural inputs, local products include those particular to regions and countries, such as the *aguardiente* or cane spirits of parts of Latin America; Korea's *shochu*, Mexico's *pulque* or India's *arrack*; as well as products peculiar to local ethnic or tribal groups. Local products are sometimes produced for home use and sometimes for trade in the informal sector of developing economies. Some products figure prominently in formal national economies, as the line between this category and global commodities becomes less clear.

Distilled spirits vary widely in strength, as the distillation process may produce liquids with very high alcohol content. Spirits of more than 50 per cent alcohol (100 proof) are rare in international trade, but local products of such strength may pose health hazards through their presence in informal economies. Some local varieties of spirits do not appear in figures recorded by national or international sources, because they are often produced for home consumption or for the informal economy. They are not captured in tax, retail sales, or industrial commodity reporting. Where available, data on local spirits have been included in efforts to estimate consumption in this report.

Wine

Wine is the smallest of the three main types of alcoholic beverages, both in volume and in pure alcohol consumed. An oversupply of wine on the world market has led some wine-making countries or regions to embark on intentional campaigns to reduce production, while others such as South Africa have put the grape surplus to work sweetening new ventures in non-alcoholic fruit juices. Wines usually range in strength from 10 to 14 per cent alcohol. Higher-alcohol grape-based products such as sherries and ports, cognacs and brandies, are generally classified as distilled spirits, although their alcohol content may be as low as 20 per cent.

Informal production of wine, whether from grapes or from other raw materials, is very difficult to measure. Even in developed countries like France, only rough estimates may be obtained of the amount of wine which, because it is made for home consumption, does not appear in official figures based on retail sales or tax records. Consumption estimates in the country profiles as well as a summary table, Table 4, in this overview include data on informal wine consumption where available.

Alcohol consumption

Estimates of per capita consumption of alcohol across the entire population aged 15 years or older can provide policy makers with some sense of the magnitude and trends likely to be found in alcohol-related problems. Among those who drink at all, the heaviest drinking 10 per cent typically account for 50 per cent or more of all alcohol consumed. Per capita alcohol consumption trends thus may be a good proxy for problems of chronic heavy drinking such as cirrhosis of the liver, but less so for problems typically more widely distributed such as alcohol-related traffic casualties (Edwards et al., 1994). Adult per capita alcohol consumption estimates can be indicative of the extent of alcohol-related problems.

Estimation methods, data sources, and data quality

Adult per capita alcohol consumption is generally estimated by dividing the sum of alcohol production and imports less alcohol exports by the adult population (aged 15 years or older). Alternately, countries may arrive at estimates by replacing production and trade data with figures derived from tracking retail sales or tax collection. As mentioned above, estimates relying on either method do not disaggregate tourist from resident alcohol consumption, nor can they measure resident alcohol consumption when abroad. Informal, home or domestic alcohol production is not in general captured by official figures. In some countries such production is extremely important and may account for as much as 80 per cent of the total alcohol available for consumption. The estimates in this report are also unable to account for stockpiling, whether by consumers or by retailers or wholesalers, nor do they include estimates of how much smuggled alcohol is consumed. Finally, the estimates tend to rely on gross estimates of average beverage strength (beer assumed to average 5 per cent alcohol, distilled spirits 40 per cent alcohol, and wine 12 per cent) in order to convert production and trade figures into estimates of pure alcohol consumed. This may lead to slight overestimation or underestimation of alcohol consumption in areas where the majority drink beverages substantially stronger or weaker than international averages (see WHO, in press, for further discussion).

Recognizing these limitations, the estimates of adult per capita alcohol consumption are the best available for monitoring global trends, since they cover more years and more countries than survey-based prevalence of alcohol use estimates (see Table 2). The largest data sets for alcohol production and trade lie with the Food and Agricultural Organization (FAO) and the United Nations Statistical Office. The problem with these data sets is that they rely in turn on figures supplied by national governments or by field or country representatives. Data are sometimes incomplete, unavailable, or estimated for several years at a stretch. Data for most of the developed countries and some developing countries are available from national governments, or from alcohol industry organizations such as the Commodity Board for the Distilled Spirits Industry. Their annual publication *World Drink Trends (Produktschap voor Gistilleerde Dranken, 1997)* uses nearly 100 sources to estimate alcohol consumption trends in 35 developed (including countries of the former Soviet Union) and 21 developing countries. This Global Status Report on Alcohol has drawn on their estimates, using FAO and other United Nations data to fill in gaps or provide insight into trends in other countries. Where data were available directly from countries, these were given priority over all other sources.

Total alcohol consumption

Sufficient data exist to estimate total recorded adult per capita consumption of pure alcohol in 153 countries. Table 2 provides these estimates, listed in order from heaviest to lightest consuming countries, for 1996, the most recent year for which data were available. The estimates rely on population data from the United Nations. Adult population figures (age 15+) were used to adjust for the differing age structures of national populations. Countries missing from the table were excluded because of missing data on alcohol production and trade, adult population, or both.

Table 2. Recorded per capita consumption of pure alcohol (litres) per adult 15 years of age and over in 1996

COUNTRY	TOTAL[1]	BEER	SPIRITS	WINE
Slovenia	15.15	5.76	0.89	8.50
Republic of Korea	14.40	2.41	11.97	0.02
Luxembourg	14.35	6.63	1.95	8.47
Czech Republic	14.35	9.83	2.03	2.49
Guyana	14.03	0.98	13.05	-
France	13.74	2.45	3.01	8.91
Portugal	13.57	3.75	0.97	8.81
Yugoslavia	13.17	3.48	4.57	5.12
Slovakia	13.00	5.79	5.14	2.07
Hungary	12.85	4.83	3.65	4.38
Denmark	12.15	7.15	1.35	4.13
Bahamas	12.09	1.08	9.82	1.18
Austria	11.90	7.04	1.82	4.59
Ireland	11.90	9.32	2.22	2.35
Croatia	11.75	4.38	1.75	5.62
Germany	11.67	8.01	2.50	3.26
Switzerland	11.27	3.65	1.81	6.30
New Caledonia	11.26	5.57	0.78	4.91
Spain	11.09	3.86	2.86	4.34
Belgium	10.94	6.20	1.34	3.65
Romania	10.88	2.37	5.01	3.49
Greece	10.41	2.33	3.23	4.88
Cyprus	10.00	3.40	4.55	2.05
Netherlands	9.80	5.13	2.16	2.51
Paraguay	9.71	3.19	6.15	0.37
Italy	9.62	1.41	1.06	7.74
Argentina	9.58	2.05	0.42	7.11
Australia	9.55	6.07	1.72	2.78
Bulgaria	9.52	3.25	3.09	3.18
United Kingdom	9.41	6.34	1.72	1.94
Venezuela	9.41	5.84	3.51	0.06
United States of America	8.90	5.36	2.43	1.12
New Zealand	8.85	6.11	1.51	2.59
Netherlands Antilles	8.78	4.61	3.37	0.80
Latvia	8.70	2.01	5.72	0.98
Thailand	8.64	0.88	7.73	0.02
Republic of Moldova	8.62	0.34	0.43	7.84
Barbados	8.37	2.82	5.10	0.45
Finland	8.26	5.06	2.40	1.12
Bosnia and Herzegovina	8.25	2.57	4.84	0.84

Table 2. Continued

COUNTRY	TOTAL[1]	BEER	SPIRITS	WINE
Uruguay	8.17	1.78	1.32	5.07
Belarus	8.14	1.08	6.49	0.57
Russian Federation	8.08	0.96	6.67	0.45
Estonia[2]	8.07	2.08	5.85	0.14
Poland	7.93	2.62	4.24	1.06
Japan	7.85	3.21	2.62	0.14
South Africa	7.72	4.42	1.59	1.72
Kazakhstan	7.71	0.47	7.09	0.16
Canada	7.52	4.23	2.16	1.19
Chile	7.06	2.40	1.98	2.68
Malta	6.91	3.34	2.06	1.50
Philippines	6.77	1.51	5.25	0.01
Gabon	6.76	3.94	0.99	1.84
Haiti	6.55	0.01	6.53	0.01
Colombia	6.41	4.27	2.11	0.02
Lithuania	6.23	1.94	3.54	0.75
Sweden	6.04	3.64	1.44	1.97
Dominican Republic	5.90	2.12	3.70	0.08
Belize	5.85	2.62	3.14	0.09
Panama	5.74	3.45	2.19	0.09
Costa Rica	5.72	0.92	4.67	0.12
Liberia	5.68	0.18	5.49	0.00
Brazil	5.57	2.96	2.28	0.33
Lebanon	5.43	0.52	3.10	1.81
China	5.39	0.95	4.38	0.06
Mexico	5.04	4.11	0.89	0.04
Norway	4.97	3.27	1.02	1.13
Iceland	4.88	2.14	1.98	0.81
The former Yugoslav Republic of Macedonia	4.86	1.92	0.62	2.32
Suriname	4.68	3.07	1.55	0.06
Georgia	4.50	0.19	0.93	3.38
Mauritius	4.33	2.01	2.14	0.19
Azerbaijan	4.16	0.12	3.39	0.65
Lao People's Democratic Republic	4.12	0.33	3.79	-
Peru	4.00	1.63	2.21	0.17
Jamaica	3.90	1.78	2.06	0.06
Cape Verde	3.86	1.39	0.45	2.02
Trinidad and Tobago	3.69	1.48	2.14	0.07
Cuba	3.53	1.00	2.31	0.22
Bolivia	3.35	1.73	1.55	0.06
United Arab Emirates	3.06	1.20	1.70	0.16
Zimbabwe	2.78	0.19	2.53	0.05
Botswana	2.68	1.97	0.50	0.21
Albania	2.59	1.02	0.77	0.80
Democratic People's Republic of Korea	2.56	0.19	2.37	-
El Salvador	2.54	1.30	1.20	0.03
Honduras	2.41	1.24	1.15	0.02
Nicaragua	2.34	0.54	1.79	0.01
Ukraine	2.31	0.30	1.63	0.38
Kyrgyzstan	2.20	0.27	1.57	0.36

Table 2. Continued

COUNTRY	TOTAL[1]	BEER	SPIRITS	WINE
Singapore	2.10	1.33	0.65	0.12
Maldives	2.08	0.60	1.22	0.26
Guatemala	1.99	0.78	1.19	0.02
Mongolia	1.95	0.13	1.82	-
Fiji	1.82	1.62	0.02	0.18
Tajikistan	1.78	0.04	1.15	0.59
Israel	1.75	0.81	0.42	0.52
Ecuador	1.66	0.63	0.89	0.13
Kenya	1.66	0.87	0.77	0.01
Guinea-Bissau	1.59	0.39	0.73	0.47
Angola	1.58	0.62	0.41	0.55
Cameroon	1.58	1.53	-	0.05
Congo	1.56	1.22	0.05	0.30
Uzbekistan	1.55	0.00	0.07	1.48
Côte d'Ivoire	1.43	1.06	0.04	0.33
Benin	1.39	0.75	0.58	0.06
Turkey	1.35	0.82	0.43	0.10
Madagascar	1.25	0.16	0.95	0.13
Viet Nam	1.21	0.38	0.83	-
Swaziland	1.18	-	1.18	-
Burundi	1.17	1.16	0.01	0.01
Turkmenistan	1.17	0.09	0.95	0.13
Lesotho	1.12	0.75	0.33	0.04
Ethiopia	1.02	0.88	0.14	0.00
Papua New Guinea	1.02	0.90	0.10	0.03
Togo	1.01	0.66	0.20	0.15
India	0.99	0.04	0.95	0.00
Vanuatu	0.96	0.29	0.09	0.57
Eritrea	0.95	0.95	-	-
Tunisia	0.89	0.34	0.09	0.46
Malaysia	0.87	0.76	0.10	0.01
Armenia	0.84	0.00	0.27	0.56
Brunei Darussalam	0.75	0.20	0.52	0.03
Rwanda	0.71	0.70	0.01	0.00
Central African Republic	0.70	0.62	0.04	0.04
Nigeria	0.66	0.65	0.01	0.00
Zambia	0.63	0.62	0.01	0.00
Iraq	0.61	0.30	0.32	-
United Republic of Tanzania	0.60	0.51	0.09	0.00
Morocco	0.58	0.25	0.05	0.28
Solomon Islands	0.56	0.41	0.10	0.04
Egypt	0.53	0.05	0.47	0.01
Djibouti	0.47	0.26	0.10	0.11
Uganda	0.46	0.22	0.24	-
Mozambique	0.45	0.23	0.19	0.04
Burkina Faso	0.45	0.34	0.11	0.00
Malawi	0.42	0.12	0.30	0.00
Ghana	0.41	0.33	0.02	0.06
Senegal	0.41	0.30	0.03	0.09
Cambodia	0.34	0.14	0.20	-

Table 2. Continued

COUNTRY	TOTAL[1]	BEER	SPIRITS	WINE
Algeria	0.27	0.15	0.02	0.10
Sudan	0.26	-	0.26	-
Chad	0.23	0.22	0.00	0.01
Syrian Arab Republic	0.21	0.07	0.14	0.01
Sri Lanka	0.21	0.06	0.15	0.00
Myanmar	0.21	0.05	0.16	-
Democratic Republic of the Congo	0.21	0.20	0.00	0.00
Guinea	0.17	0.16	-	0.01
Gambia	0.16	0.05	0.05	0.06
Yemen	0.15	0.11	0.04	-
Indonesia	0.13	0.06	0.07	0.00

[1]Rows may not total exactly due to variations in estimates of alcoholic strength of each category in each country.
[2]The estimates for Estonia are for the year 1995, and come from the following sources: Statistical Office of Estonia, *Statistical Yearbook of Estonia 1996* (Tallinn, Statistical Office of Estonia, 1996), and Statistical Office of Estonia, *Foreign Trade* (Tallinn, Statistical Office of Estonia, 1996).
Sources: FAO Statistical Databases 1998; Produktschap voor Distilleerde Dranken, 1997; United Nations Statistical Office, 1997; United Nations Population Division 1994 .

Table 3 compares total adult per capita consumption of pure alcohol in 1970-1972 and 1994-1996. Three-year averages have been used to minimize the impact of short-term temporal fluctuations in adult alcohol consumption. Data are available for both time periods for 137 countries, drawing again on *World Drink Trends* and on the FAO and UN statistical databases. The countries are listed in the order of magnitude of their percentage change in alcohol consumption. As the table demonstrates, developing countries and countries in transition[1] were more likely to increase their recorded adult per capita consumption of alcohol than the developed countries: 47 per cent of the developing countries or countries in transition increased since 1970, whereas 35 per cent of the developed countries recorded higher consumption of pure alcohol per adult.

Table 3. Trends in recorded per capita consumption of pure alcohol, (litres) per adult 15 years of age and over between 1970-1996

COUNTRY	1970-1972	1994-1996	PER CENT CHANGE
Lesotho	0.06	1.15	1816.67
China	1.03	5.17	401.94
Thailand	1.93	8.37	333.68
Guyana	3.59	14.45	302.51
Nigeria	0.23	0.68	195.65
Philippines	2.44	6.94	184.43
Malta	2.53	7.14	182.21
Republic of Korea	5.23	14.4	175.33
Pakistan	0.05	0.13	160.00
Rwanda	0.41	0.94	129.27
Dominican Republic	2.64	5.8	119.70
Burkina Faso	0.19	0.41	115.79
Sudan	0.12	0.25	108.33

[1] Albania; Armenia; Azerbaijan; Belarus; Bosnia and Herzegovina; Bulgaria; Croatia; Czech Republic; Estonia; Georgia; Hungary; Kazakhstan; Kyrgyzstan; Lativa; Lithuania; Poland; Republic of Moldova; Romania; Russian Federation; Slovakia; Tajikistan; The former Yugoslav Republic of Macedonia; Turkmenistan; Ukraine; Uzekistan; Yugoslavia.

Table 3. Continued

COUNTRY	1970-1972	1994-1996	PER CENT CHANGE
India	0.45	0.93	106.67
Cyprus	5.02	10.37	106.57
Burundi	0.71	1.45	104.23
Mauritius	2.01	4.07	102.49
Liberia	2.97	5.9	98.65
Malaysia	0.45	0.89	97.78
Paraguay	4.72	8.83	87.08
Malawi	0.23	0.43	86.96
Guinea	0.15	0.28	86.67
Brazil	3.18	5.55	74.53
Egypt	0.31	0.54	74.19
Lebanon	3.45	5.72	65.80
Turkey	0.86	1.42	65.12
Indonesia	0.07	0.11	57.14
Albania	1.55	2.43	56.77
Benin	0.73	1.12	53.42
El Salvador	1.74	2.64	51.72
South Africa	5.07	7.69	51.68
Colombia	4.32	6.47	49.77
Cape Verde	2.69	3.95	46.84
Cuba	2.67	3.85	44.19
Costa Rica	4.15	5.97	43.86
Mexico	3.67	5.11	39.24
Iraq	0.46	0.62	34.78
Greece	7.88	10.62	34.77
Finland	6.19	8.27	33.60
Venezuela	7.06	9.28	31.44
Ireland	9.11	11.82	29.75
Japan	6.1	7.88	29.18
Lao People's Democratic Republic	3.43	4.43	29.15
Viet Nam	0.93	1.2	28.41
Denmark	9.42	12.08	28.24
Bolivia	2.64	3.38	28.03
United Kingdom	7.35	9.25	25.85
Romania	8.25	10.14	22.91
Barbados	7.47	9.07	21.42
Panama	4.75	5.62	18.32
Syrian Arab Republic	0.19	0.22	15.79
Zimbabwe	2.57	2.95	14.79
Gabon	5.93	6.8	14.67
Netherlands	8.53	9.75	14.30
Luxembourg	13.19	14.66	11.14
Uruguay	7.41	8.2	10.66
Bulgaria	9.13	9.8	7.34
Trinidad and Tobago	4.55	4.8	5.49
Honduras	2.32	2.41	3.88

Table 3. Continued

COUNTRY	1970-1972	1994-1996	PER CENT CHANGE
Ecuador	1.81	1.86	2.76
Poland	8.04	8.16	1.49
Cameroon	1.65	1.65	0.00
Ghana	0.46	0.46	0.00
Hungary	13.11	13.09	-0.15
Mongolia	2.05	2.03	-0.98
Ethiopia	0.96	0.95	-1.04
Botswana	2.84	2.8	-1.41
Norway	4.94	4.84	-2.02
Belize	5.9	5.76	-2.37
Czech Republic	14.63	14.28	-2.39
Swaziland	1.25	1.22	-2.40
Iceland	4.94	4.75	-3.85
Jamaica	4.19	3.98	-5.01
Togo	0.98	0.93	-5.10
Singapore	2.1	1.98	-5.71
Belgium	11.92	11.07	-7.13
Papua New Guinea	1.15	1.06	-7.83
United Republic of Tanzania	0.58	0.53	-8.62
United States of America	9.92	8.98	-9.48
Slovakia	13.75	12.37	-10.04
Kenya	1.78	1.6	-10.11
Netherlands Antilles	9.74	8.48	-12.94
Sweden	7.33	6.36	-13.23
Germany	13.81	11.88	-13.98
Australia	11.44	9.68	-15.38
Canada	9.16	7.62	-16.81
Haiti	6.93	5.72	-17.46
Switzerland	14.13	11.46	-18.90
Portugal	16.77	13.37	-19.60
Austria	14.97	11.91	-20.27
Central African Republic	0.96	0.76	-20.44
Morocco	0.73	0.58	-20.83
Democratic People's Republic of Korea	3.89	3.07	-21.08
New Zealand	11.58	9.11	-21.33
Sri Lanka	0.26	0.2	-23.08
Uganda	0.55	0.42	-23.64
Guatemala	2.35	1.79	-23.83
Tunisia	1.24	0.9	-27.42
Fiji	2.57	1.81	-29.57
Bahamas	17.42	12.15	-30.25
Spain	16.42	11.4	-30.57
Israel	2.48	1.72	-30.65
Solomon Islands	0.63	0.43	-31.75
Senegal	0.61	0.41	-32.79
France	21.37	14.02	-34.39

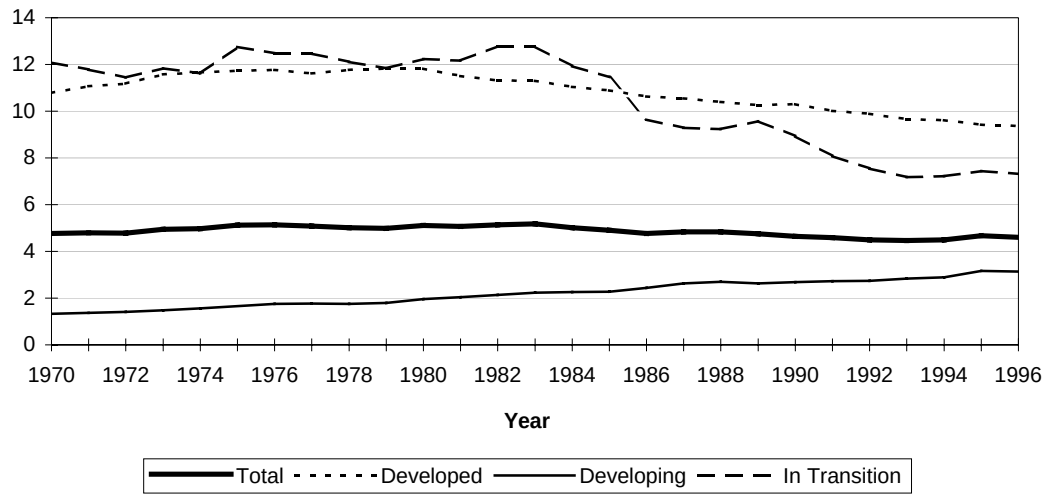
Table 3. Continued

COUNTRY	1970-1972	1994-1996	PER CENT CHANGE
Cambodia	0.6	0.39	-35.00
Côte d'Ivoire	1.95	1.26	-35.38
Madagascar	2.0	1.25	-37.50
Suriname	7.58	4.63	-38.92
Congo	2.94	1.78	-39.46
Peru	7.12	4.3	-39.61
Guinea-Bissau	2.76	1.62	-41.30
Myanmar	0.36	0.21	-41.67
Chile	13.01	7.46	-42.66
Chad	0.3	0.17	-43.33
Gambia	0.25	0.14	-44.00
Nicaragua	4.71	2.62	-44.37
Argentina	17.52	9.73	-44.46
Italy	18.08	9.72	-46.24
Niger	0.12	0.06	-50.00
New Caledonia	20.75	10.19	-50.89
Yugoslavia	23.28	11.26	-51.63
Brunei Darussalam	1.52	0.69	-54.61
Angola	4.17	1.78	-57.31
Algeria	0.68	0.27	-60.29
Mozambique	1.25	0.49	-60.80
Comoros	0.21	0.08	-61.90
Vanuatu	3.13	1.15	-63.26
Jordan	0.11	0.04	-63.64
United Arab Emirates	10.61	3.79	-64.28
Zambia	1.82	0.65	-64.29
Sierra Leone	0.3	0.1	-66.67
Yemen	0.55	0.17	-69.09
Mali	0.12	0.02	-83.33
Democratic Republic of the Congo	1.31	0.21	-83.97
Djibouti	3.27	0.48	-85.32
Mauritania	0.14	0.01	-92.86

Sources: FAO Statistical Databases 1998; United Nations Statistical Office 1997 .

The story of the past 25 years is more dramatically told by looking at the trends in adult per capita consumption of pure alcohol by economic region, as shown in Figure 3. What was less clear in the rankings by country becomes more obvious when the data are aggregated by economic region: recorded adult consumption of pure alcohol peaked in 1979 in the developed countries and in 1983 in the economies in transition, while it has been rising unabatedly in the developing world since 1970. Overall, reported world alcohol consumption has been decreasing since the mid-1980s. However, as discussed above, it is unlikely that the decline in apparent alcohol consumption in the economies in transition, which appears to have fuelled this decrease, is as depicted. The large amount of illegal alcohol production and smuggling that has reportedly occurred since the break-up of the Soviet Union points to the importance of gathering information regarding unrecorded alcohol production and consumption.

Figure 3: Recorded Adult (15+) Per Capita Consumption 1970-1996 by Economic Region (in litres of pure alcohol)



Sources: FAO Statistical Databases; Produktschap voor Distilleerde Dranken, 1997; United Nations Population Division 1997.

Recorded versus unrecorded alcohol consumption

In the countries of the former Soviet Union, and in many developing countries as well, production for home use or for the informal sector is extremely important, reaching as high as 80 per cent of the total alcohol available for consumption. Few reliable data exist regarding consumption of these forms of alcohol. Table 4 below shows total alcohol consumption figures, adjusted for unrecorded production and trade, for the 20 countries for which data are available.

The table also provides a basis for those adjustments including a reference. All adjustments are derived from government or survey-based estimates. In some cases, particularly in developed countries such as Austria or Denmark, the adjustments are relatively small. In Eastern European, the Russian Federation and developing countries such as Ecuador and Kenya, the adjustments are substantial.

Table 4. Per capita consumption of pure alcohol (litres) per adult, 15 years of age and over adjusted for unrecorded production and trade

COUNTRY	YEAR	RECORDED	ADJUSTED	ADJUSTMENT
Austria (Uhl & Springer, 1994)	1994	11.91	12.62	Adjusted for legal production of pear, apple and grape ciders.
Brazil (Dunn & Laranjeira, 1996)	1996	5.07	14.01	Adjusted for government estimate of 1 billion litres of unrecorded pinga production.
Chile (PAHO, 1990)	1990	7.86	9.43	Increased by 20 % to allow for clandestine production.
Denmark (Nordic Alcohol Statistics, 1995)	1994	11.97	14.36	Increased by 20 % to reflect unrecorded consumption.
Ecuador (PAHO, 1990)	1990	2.10	8.40	Adjusted for clandestine production estimated at three times official production.
Estonia (Jernigan, 1997)	1995	8.07	10.74	Adjusted for police estimates that the black market represents 25 % of the total market.
Finland (Nordic Alcohol Statistics, 1995)	1994	8.16	9.79	Increased by 20 % to account for unrecorded consumption.
Greece (Gefou-Madianou, 1994)	1990	10.65	12.51	Increased by 1.5 litres per capita to reflect unrecorded consumption.

Table 4. Continued

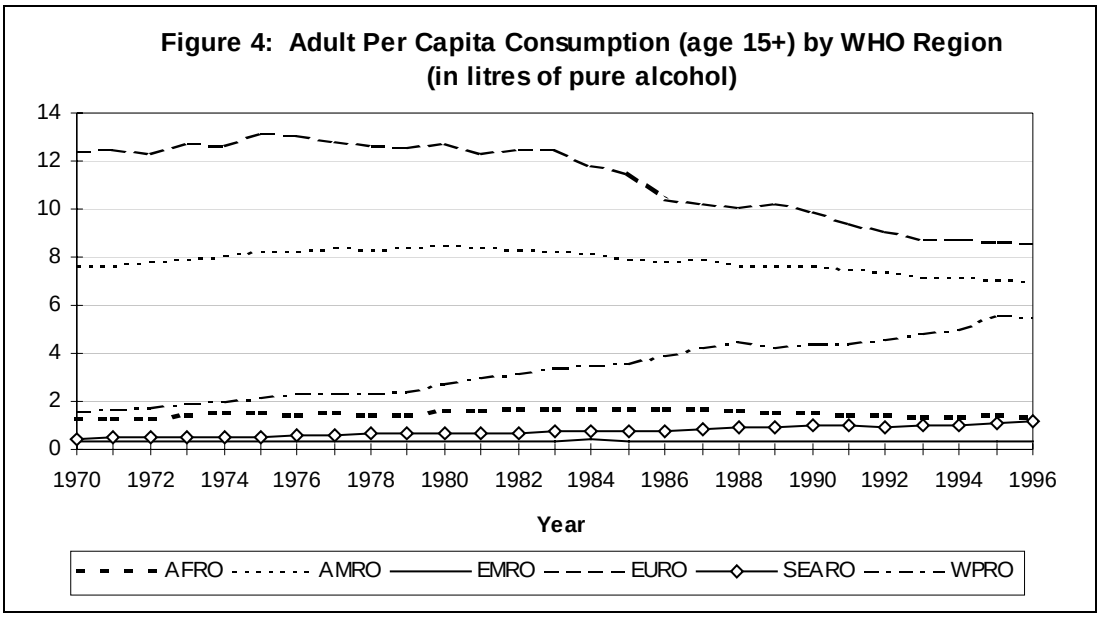
COUNTRY	YEAR	RECORDED	ADJUSTED	ADJUSTMENT
Hungary (Fekete, 1995)	1995	11.47	14.52	Increased by 2.5 litres per capita to reflect unrecorded alcohol consumption.
Iceland (Pálsson, 1995)	1994	4.63	5.52	Increased by 0.89 litres per capita to reflect tax free alcohol sales, home production and smuggled alcoholic beverages.
Kenya (Partanen, 1993)	1990	2.29	17.29	Adjusted to reflect the estimated 80-90 (85) % of total alcohol derived from the informal sector.
New Zealand (Casswell, 1997)	1995	8.92	9.19	Adjusted to reflect estimated 3% of total consumption that is unrecorded.
Norway (Nordic Alcohol Statistics, 1995)	1994	4.70	6.26	Adjusted to reflect unrecorded consumption totalling an estimated one-third of recorded consumption.
Republic of Moldova (Vasiliev, 1994)	1993	12.67	18.1	Adjusted to reflect estimate that unregistered consumption accounts for 70% of total consumption.
Russian Federation (Harkin, 1995)	1993	6.99	14.49	Adjusted to reflect estimate that per capita unrecorded consumption was 7.5 litres.
Slovenia (Cesabek-Travnik, 1995)	1993	14.90	24.19	Adjusted to reflect estimate that unrecorded consumption was between 7 and 8 litres per capita.
South Africa (Parry, 1997)	1995	7.81	10.0	Adjusted to include estimate of total production of beer from sorghum.
Sweden (Orjes, 1997)	1996	6.04	6.95	Adjusted to reflect estimate that 13 per cent of the alcohol consumed is illegal.
The former Yugoslav Republic of Macedonia (Jovev, 1993)	1992	6.33	12.66	Adjusted to reflect estimate that 50 per cent of total production is home made.
Ukraine (Krasovsky & Viyevsky, 1994)	1993	4.17	13.00	Adjusted to reflect estimate that total unrecorded consumption was 7.0 litres per capita.

Sources for recorded consumption estimates: FAO Statistical Databases; Produktschap voor Distilleerde Dranken, 1997; United Nations Population Division 1994.

Summary of Global Data on Adult Alcohol Consumption

Although estimates of recorded adult per capita alcohol consumption have limitations, both in terms of the accuracy of the data available and the limits of recorded data in general, they are the best data sets available for assessing global trends in alcohol use, and by extension, alcohol related problems. The following section discusses drinking patterns within the six WHO regions of the world. These regions do not conform to the developed/developing/in transition typology used above in Figure 3. For instance, the WHO Western Pacific Region (WPRO) includes Japan, Australia and New Zealand, as well as countries as economically and physically diverse as China and Kirabati. Maps of the countries included in each WHO region are provided.

Figure 4 below shows the trends in global adult alcohol consumption in the six WHO regions. The figure confirms what has already been described: in the regions with the highest levels of economic development, alcohol consumption tends to be the highest. It is falling most rapidly in the WHO European Region (EURO), and rising most rapidly in the WHO Western Pacific Region. Alcohol consumption in these two regions appears to be converging with the WHO Region of the Americas (AMRO) at the relatively high levels of approximately between 5-9 litres of pure alcohol per adult per year. The pace of declining alcohol consumption in EURO is undoubtedly overstated due to the large amounts of unrecorded alcohol production and consumption that have occurred since the break-up of the former Soviet Union. Alcohol consumption in the South-East Asian Region (SEARO) is rising slowly but at a much lower rate, as is the essentially stable alcohol consumption in the African (AFRO) and Eastern Mediterranean (EMRO) regions.



Sources: FAO Statistical Databases; Produktschap voor Distilleerde Dranken, 1997; United Nations Population Division 1994.

Drinking prevalence

Adult per capita alcohol consumption estimates may provide evidence of long-term trends, but they tell little about actual drinking in the population. In countries where the bulk of the drinking is done by a minority, for instance males from a single ethnic or religious group, per capita alcohol consumption figures can mask the extent of drinking and coerce policy makers into unwarranted complacency regarding likely health effects. 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. South Africa, for example, appears to have relatively moderate adult per capita alcohol consumption, at 7.72 litres of pure alcohol per person, gaining it the 45th rank in Table 2 which presents adult recorded per capita alcohol consumption in 1996. However, in the largest ethnic group, black Africans, comprising 75.2 % of the population, only 48 per cent of male adults and 23 per cent of female adults drink (Roche-Silva, 1990). Thus while a majority of black South African adults do not drink at all, average yearly intake of absolute alcohol among those who do is closer to 20 litres of absolute alcohol, a much higher level than the statistics would initially suggest.

Data sources and quality

Measuring drinking amounts and patterns is a complex matter. 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. Fourteen drinks at one sitting once per week carry very different health risks from two drinks a day, 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. However, there is little uniformity among these scales. When surveys have been done in developing countries, they have been more often oriented to populations considered at high risk of alcohol problems, such as young people or health care service users, and aimed at identifying problem rates of use rather than describing drinking patterns among the entire population. WHO is in the process of developing guidelines for countries seeking to collect data on drinking patterns, recommending standardized survey methods and questions (WHO, in press). In the absence of data from such standardized research, cross-national comparisons are difficult, and must be qualified with regard to the many different definitions and methods used.

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 400 surveys of alcohol use were utilized in this report, describing patterns of use in 102 countries. Surveys were deemed acceptable for comparison if they randomly sampled national populations, or if they sampled substantial regional populations. 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.

Patterns of drinking in the WHO regions

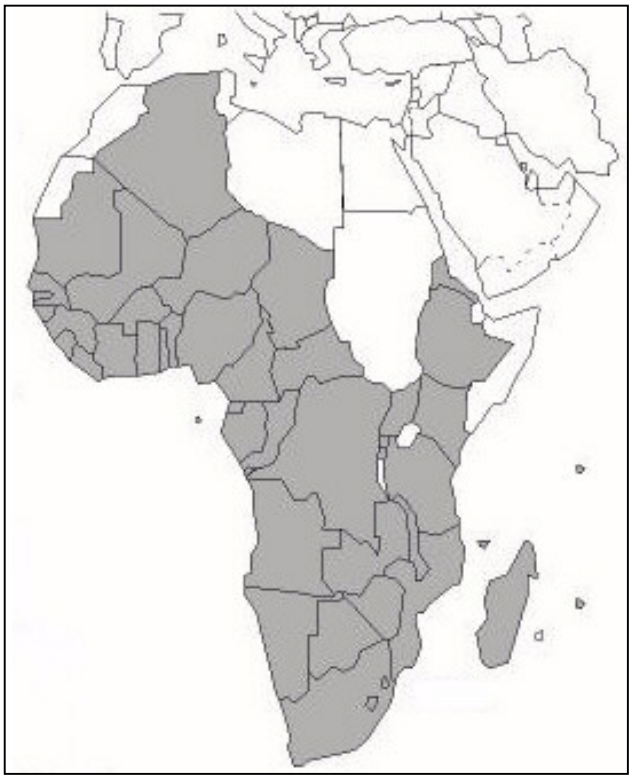
This report discusses patterns of drinking in the six WHO regions: the African Region (AFRO), the Region of the Americas (AMRO), the Eastern Mediterranean Region (EMRO), the European Region (EURO), the South-East Asian Region (SEARO), and the Western Pacific Region (WPRO). As Table

5 illustrates, the range of adult per capita alcohol consumption is quite broad across countries in each region, while the median adult per capita alcohol consumption rate is only slightly more informative. It is necessary to examine more closely the prevalence and patterns of drinking to gain a clearer sense of actual drinking behaviour.

Table 5. Median and range of recorded per capita consumption of alcohol per adult 15 years of age and over, and geographic coverage of survey data by WHO region

REGION	CONSUMPTION (LITRES)	RANGE	MEDIAN	COUNTRIES WITH SURVEY DATA/ TOTAL NUMBER OF COUNTRIES	PER CENT OF POPULATION COVERED
AFRO	1.37	0.02 - 7.72	0.95	7/46	34
AMRO	6.98	1.66 - 14.03	5.74	19/36	95
EMRO	0.30	0.05 - 10.00	0.53	2/22	19
EURO	8.6	0.85 - 15.12	8.26	22/52	45
SEARO	1.15	0.004 - 8.64	0.99	2/10	67
WPRO	5.54	0.34 - 18.39	1.95	9/28	93

African Region



Available data on drinking in the African region comes mostly from sub-Saharan and anglophone Africa. Because of the paucity of data, criteria for inclusion were expanded, and studies will be discussed describing drinking patterns in 12 countries. A pattern of greater drinking among males than females is evident across the region, except among the younger drinkers of some countries. A study in Cameroon found that formally uneducated males were the most likely to drink heavily (Yguel et al., 1990), and several Nigerian studies reported higher lifetime use of alcohol among men, as well as greater signs of alcohol dependence among male drinkers (Adelekan et al., 1993; Obot, 1993; Abiodun, 1996). Male drinkers in Seychelles drink nearly eight times as much alcohol as females who drink (Pinn & Bovet, 1991). Among South Africa's Black African majority, more than twice the number of men drink regularly than women (Roche-Silva, 1990). Male Tanzanian villagers were more likely to drink, drink frequently (reporting six or more drinking occasions in the past month), and recall consumption of twice as much alcohol on the most recent occasion as female drinkers (Rijken et al., 1998). Four times as many men as women in Zambia drink weekly, while 70 per cent of women reported never drinking as opposed to only 35 per cent of men (Haworth, n.d.). Studies among health care workers and patients in Zimbabwe found that in both groups, men were more likely than women to drink to intoxication (Butau, 1992; Chinyadza et al., 1993). The pattern of customarily drinking frequently, and to intoxication, appears in substantial percentages of drinkers throughout the African region. Of the 74 per cent of Zimbabwean industrial workers who report drinking, 66 per cent drink every weekend and 22 per cent drink daily (Moses, 1989). Another study of Zimbabwean hospital workers found that 93 per cent of male and 68 per cent of female current drinkers drank to intoxication every time they drank (Butau, 1992). In Lesotho, 33.3 per cent of male and 15.9 per cent of female drinkers reported spending the entire day drinking, while 29 per cent of

men and 23 per cent of women drank seven or more drinks on a typical drinking day (Lesotho Highlands Water Project, 1996a). Among heads of households (mostly male) in the Middlebelt region of Nigeria, 27.5 per cent of drinkers reported drinking two or more times a day, and 39.2 per cent of drinkers (20.8 per cent of the total sample) drank at least daily. Consumption of six bottles of beer or more at one sitting was not uncommon, while nearly three-quarters of the drinkers (20.8 per cent of the sample) drank at least three bottles of beer (1.7 litres, or approximately 67 grams of pure alcohol) in a typical drinking session (Obot, 1993). Nineteen per cent of males in Seychelles reported drinking more than 100 grams of alcohol per day (Pinn & Bovet, 1991). South Africa's most recent general population survey found that more than a quarter of Black African males were drinking more than 87 grams of pure alcohol a day (Parry & Bennetts, 1998). Traditional beverages such as sorghum-based beer and palm wine are most popular among older drinkers, while younger drinkers and those with a more European or American cultural orientation are more likely to prefer malt and barley-based beers. Studies in Nigeria and Zimbabwe found that those in higher income generating occupational groups, and those who are more European or Americanized in cultural orientation, are more likely to drink heavily.[1] (Abiodun, 1996; Eide & Acuda, 1996). Half of a sample of secondary students in Lesotho between the ages of 11 and 22 years believed that moderate drinking was impossible and that the fun of drinking was to get drunk (Meursing & Morojele, 1989).

In Namibia, an estimated 20 per cent of schoolchildren and 75 per cent of young people not in school abuse alcohol on weekends (Parry, 1997). In some areas, drinking begins at a very young age. In Zimbabwe, 31.1 per cent of those aged 14 years and under reported using alcohol, while in Lesotho 8.8 per cent of children aged between 10 to 14 years and 4 per cent of those aged between 5 to 9 years currently use alcohol (Acuda & Eide, 1994; Lesotho Highlands Water Project, 1996b).

Region of the Americas

Patterns of drinking in the Americas differ greatly between the two northern developed nations (Canada and the United States) and the developing states of Central and South America. Unlike other developed countries, the United States of America (US) has a relatively high rate of abstention. In the most recent household survey, 51 per cent had used alcohol in the past month, about 15.5 per cent engaged in frequent heavy drinking (five or more drinks on at least one occasion in the past month), and about 5.4 per cent were heavy drinkers (drinking five or more drinks per occasion on five or more days in that past 30 days) (US Department of Health and Human Services, 1995). Men are more than six times as likely to engage in heavy drinking as women. Hazardous drinking, defined as five or more drinks on one occasion, accounted for more than 53 per cent of all drinking in the US, and the heaviest drinking 10 per cent of adults, averaging two to four drinks per day, accounted for 60 per cent of total alcohol consumption (Greenfield, 1995).

Young people and young adults drink more heavily than the rest of the US population. Young adults between the ages of 18 and 25 years are the group most likely to engage in hazardous drinking, defined as five or more drinks at one sitting (US Department of Health and Human Services, 1995). In 1995, 55 per cent of 8th graders (13 to 14-year-olds), 71 per cent of 10th graders (15 to16-year-olds), 81 per cent of 12th graders (17 to18-year-olds) and 90 per cent of college students had tried alcohol. Among high school seniors, 51.3 per cent used alcohol in the past month (55.7 per cent for males and 47.0 per cent for females), and 3.5 per cent drank daily (5.5 per cent for males and 1.6 per cent for females) (US Department of Health and Human Services, 1996). In 1997, 31 per cent of 12th graders and 25 per cent of 10th graders reported hazardous drinking within the past two weeks (University of

[1] The use of the terms "heavy", "heavily", "binge", and so forth, to describe drinking patterns, are defined differently in different studies. In this report, wherever a definition of these terms was included in the study being cited, that definition is included in the text of the report.

Michigan News and Information Service, 1997). Adult prevalence of alcohol use in Canada has fallen since the 1970's, with 72.3 per cent of the 1994 national survey reporting alcohol use in the past year. This is in contrast to 80.4 per cent in 1978/79. Men, young adults (aged 20 to 24 years), and those with higher incomes, post-secondary education and current employment are more likely to drink (McKenzie, Williams & Single, 1997). Among students, 58.8 per cent reported using alcohol in the past year, with the highest levels of use in the 18 and above age group (78.2 per cent) and the lowest use among those aged 13 years and under (31.1 per cent). Young males are only slightly more likely to drink than young females (Adlaf et al., 1995). In the Central and South American countries, differences between male and female drinking are in general more marked, and annual prevalence of drinking is in general lower, ranging from 32 per cent in Jamaica to a high of 82.9 per cent in Peru (Jutkovitz & Hongsook, 1994; Ortega, 1993). While male and female drinking prevalence is somewhat closer in primarily wine-drinking Chile, in Mexico, where beer and spirits are much more popular, twice as many men drink alcohol as women (Navarro, 1997; Medina-Mora, 1997).

Table 6. Annual (*Lifetime) adult prevalence of drinking in selected countries in the Region of the Americas

COUNTRY	MALE (%)	FEMALE (%)	TOTAL (%)
Argentina (Matos et al., 1996)	-	-	66.7
Belize* (Pride Belize Survey Project Team, 1993)	-	-	61.0
Bolivia (Del Castillo & Salinas, n.d.)	76.2	60.4	66.9
Canada (McKenzie et al., 1997)	78.1	66.7	72.3
Chile (Sistema Nacional de Informacion Sobre Drogas, 1996)	68.7	53.6	60.0
Colombia (Ospina, 1997)	-	-	59.8
Costa Rica (Bejarano & Alvarado, 1997)	-	-	40.3
Dominican Republic (Jutkovitz et al., 1992a)	64.8	46.0	55.0
Ecuador* (Jutkovitz & Hongsook, 1994)	-	-	75.7
Guatemala* (Development Associates Inc., 1990)	65.9	48.3	56.7
Haiti* (Development Associates Inc., 1991)	60.3	56.4	57.8
Jamaica (Jutkovitz & Hongsook, 1994)	45.0	20.0	32.0
Mexico (Medina-Mora, 1997)	73	37	54
Panama (Jutkovitz et al., 1992b)	72.1	37.9	54.2
Paraguay* (Miguez & Pecci, 1997)	88	75	79.5
Peru (Ortega, 1993)			82.9
United States of America (US Department of Health and Human Services, 1996)	70	60.2	64.9
Venezuela (Conseil Nacional de Drogas, 1997)	-	-	62.9

Table 7. Prevalence of heavy drinking in selected countries in the Region of the Americas

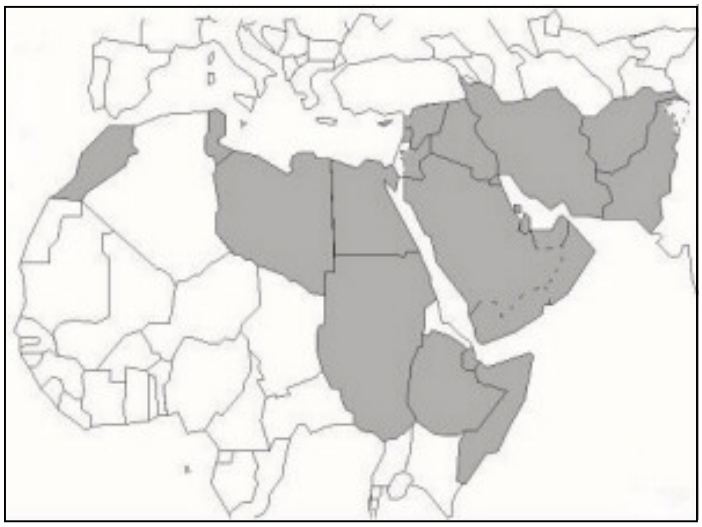
COUNTRY	TOTAL (%)	MALE (%)	FEMALE (%)	DEFINITION
Brazil (Moreira et al., 1996)	15.5	-	-	>30g/day
Costa Rica (Bejarano et al., 1996)	9.7	-	-	men: >78.5g/day; women: >47 g/day
Mexico (Medina-Mora, et al., 1990)		31.1	5.0	>=5 drinks at least once/week
Mexico (Secretaria de Salud, 1995)	23.0	-	-	>=5 drinks on an occasion
Paraguay (Miguez & Pecci, 1997)	35.6	-	-	>78.5 g/occasion
United States of America (US Department of Health and Human Services, 1996)	5.4	9.3	1.9	>=5 drinks on 5+ occasions in past month
United States of America (US Department of Health and Human Services, 1996)	15.5	22.8	8.7	>=5 drinks at least once in past month

The little available data on heavy drinking shows an even greater difference between male and female patterns of drinking. Mexican men are six times as likely as women to drink at least five drinks at least once per week (Medina-Mora et al., 1990). The legacy of fiesta drinking is evident in

Mexican drinking patterns, and may be prevalent in other Latin American countries as well. The result of this concentration of heavy drinking among a relatively small group of men is that a quarter of Mexico's drinkers account for 78 per cent of the country's alcohol consumption (Medina-Mora, 1997). Although Mexico's recorded adult per capita consumption of alcohol is only a fairly moderate 5.04 litres (ranking only 65th of the 151 countries shown in Table 2), this group of heavy drinkers consumes alcohol at the rate of 17.6 litres of pure alcohol per person per year. This high rate of annual alcohol consumption combined with the fact that 23 per cent of Mexico's population drinks at least five drinks per occasion puts Mexico at risk of losses from both long-term chronic alcohol problems such as liver disease and cirrhosis and short-term acute alcohol problems such as motor vehicle injuries (Secretaria de Salud, 1995).

There are not many studies available regarding drinking among young people in the Region of the Americas, and those that are available are largely not comparable, since they look at a variety of different age groups. In some countries, drinking is initiated at a fairly young age. For instance, in the Dominican Republic 43 per cent of 12 to 14-year-olds reported having tried alcohol (Jutkovitz et al., 1992a). The percentage of drinkers increases with age, and in most countries, more than two-thirds of young people report current drinking by the time of completion of secondary school. There are some indications that drinking among younger people is rising. In Brazil, surveys of secondary school students in ten state capitals in 1987, 1989 and 1993 found a significant increase in youth drinking in seven of the ten cities, and among young females in eight of those ten (Cotrim, 1997). In Haiti, 19 to 24-year-olds have the highest prevalence of drinking, although those aged 35 to 39 years approach similar levels (Development Associates, 1991). In Chile, regular consumption of alcohol among young people rose from 11.5 per cent in 1984 to 18 per cent in 1990 (Urzua, 1993). In contrast, in the United States, the percentage of high school seniors who drink at least monthly has fallen from 72 per cent in 1980 to 51 per cent in 1993 (US Department of Health and Human Services, 1996).

Eastern Mediterranean Region



There is very little information on drinking prevalence in the Eastern Mediterranean Region. The strong influence of Islam throughout much of the region leads to quite low alcohol use in most countries. Areas with substantial Christian populations, such as Lebanon, are an exception. There are pockets of heavy drinking among minority peoples such as the Bari in Southern Sudan (Huby, 1994). Lebanon has substantial recorded alcohol consumption, but WHO was unable to find any studies of drinking patterns in this country. United Arab Emirates, Oman and Qatar also show substantial recorded alcohol consumption, but it is likely in both cases that the bulk of the drinking occurs among guest workers rather than the permanently resident population. A 1990 study of medical students in Morocco found that 23 per cent were current drinkers (Touhami & Bouktib, 1990), and there are reports that European or American influences are contributing to a rise in drinking among young males in the Sudan (Nadim & Rahim, 1984).

European Region

The WHO European Regional Office (WHO/EURO) has aggressively promoted monitoring of alcohol use and problems among WHO Member States. In 1995, it produced profiles of alcohol use, problems and policies in 44 countries (Harkin, 1995). Some of the data collected for these profiles later appeared in the publication *Smoking, Drinking and Drugs- the European Region* (WHO Regional Office for Europe, 1997). Data on drinking patterns among young people in 26 European countries were published in 1997 as part of the European School Survey Project on Alcohol and Other Drugs (ESPAD, 1997) (Hibell et al., 1997). In general, with the exception of the far eastern part of the region (e.g. the Islam-influenced republics of the former Soviet Union), countries in the European region have the highest adult prevalence of drinking in the world. In part, this is due to the fact that, for most European countries, the difference between male and female consumption patterns is small relative to other parts of the world. Table 8 below provides adult prevalence figures for selected European countries. The discontinuity between annual prevalence of drinking and adult per capita consumption arises because while two countries may have similar proportions of the total population drinking, their patterns of drinking, both in terms of how quantity and frequency of drinking is distributed in the population, can vary considerably. Such factors play an important role in determining how much alcohol is consumed in a country overall, and in shaping the nature of alcohol problems in that country.

Table 8. Annual prevalence of drinking in selected European countries

COUNTRY	MALE (%)	FEMALE (%)
Estonia (Narusk 1991)	97.0	86.0
Finland (Simpura, Paakkanen & Mustonen, 1995)	90.0	82.0
Greece (Madianou et al., 1987)	93.4	77.8
Hungary (Buda, 1987)	93.4	78.6
Netherlands (Inge et al., 1997)	88.4	76.3
Norway (Harkin et al, 1997)	89.9	80.3
Poland (Harkin et al., 1997)	93.8	84.1
Portugal	85.2	66.8
Spain (Gili Miner & Gini Ubago, 1987)	90.0	80.0
Sweden (Hurst, Gregory & Gussman, 1997)	90.0	75.0
Switzerland (ISPA, 1993)	90.0	77.0

To examine drinking within the population, a number of European countries have surveyed their populations to identify the prevalence of heavy drinking. Such surveys generally measure how much and/or how often people drink. There is little uniformity in the definition of heavy drinking. Table 9 below provides data from the countries that have measured drinking quantities. Even with a wide range of definitions, the data clearly show that men are far more likely (between 3 and 16 times as likely as women) to consume large quantities of alcohol on a regular basis.

Table 9. Heavy drinking by quantity in selected European countries

COUNTRY	MALE (%)	FEMALE (%)	TOTAL (%)	DEFINITION
Austria (Uhl & Springer, 1994)	28.8	4.3	16.2	>60 g/day
Czech Republic (Ferrer et al., 1995)	28.0	8.0	-	Men: >=50g/day; women: >=20g/day
Denmark (Harkin et al, 1997)	-	-	5.0	>60g/day
France (Harkin et al,1997)	15.9	1.0	-	>50g/day
Germany (former East) (Harkin, 1995)	-	-	8.0	>280g/week
Germany (former West) (Harkin, 1995)	-	-	14.0	>280g/week
Iceland (Pálsson 1995)	8.1	1.6	-	5+ litres pure alcohol in past six months
Ireland (O'Connor & Daly, 1983)	11.0	1.0	-	Men: >500g/week; women: >350g/week
Netherlands (Inge et al., 1997)	14.2	2.6	8.2	6+ drinks on 9+ days or 4-5 drinks on 21+ days per month.
Poland (Sieroslawski & Moskalewicz, 1994)	23.7	3.6	-	Men: >150g/week; women: >115g/week
Spain (Robledo de Dios, 1996)	-	-	4.0	>415g/week
Switzerland (Harkin et al, 1997)	9.2	1.6	-	>=60g/day
United Kingdom (UK Department of Health, 1992)	6.0	2.0	-	Men: >400g/week; women: >280g/week

Table 10 shows the countries where data are available on heavy drinking defined by frequency as opposed to quantity. While gender of drinkers is not given in these studies, the data show how divergent drinking patterns are in the European region. In some countries, such as Italy, the majority of the population drink at least three times per week. Elsewhere, such as in Ireland, frequent drinking is much less prevalent, but 11 per cent of men drink more than 500 grams of pure alcohol per week. This suggests a pattern of very heavy alcohol consumption on less than three occasions per week, and points out the relationship between patterns of drinking alcohol, per capita alcohol consumption, and the prevalence of health and social problems. A substantial portion of the population drinking very heavily on occasion but not frequently, such as in Ireland, puts the nation at high risk of health damage from acute effects of alcohol consumption such as injuries and motor vehicles crashes. In Spain, on the other hand, where close to a third of the drinkers consume alcohol at least three times per week, only four per cent drink more than 415 grams per week. This implies that Spain will be at higher risk of long term, as opposed to acute, effects of heavier alcohol consumption.

Table 10. Frequent drinkers in selected European countries

COUNTRY	FREQUENT DRINKERS (%)	DEFINITION
Belgium	19	3 or 4 days/week
Denmark	16	3 or 4 days/week
Ireland	5	3 or 4 days/week
Israel	2	Daily for the past year
Italy	53	3 or 4 days/week
Luxembourg	20	3 or 4 days/week
Netherlands	20	3 or 4 days/week
Spain	32	3 or 4 days/week
United Kingdom	16	3 or 4 days/week

Sources: Commission of the European Community (Europeans Against Cancer Programme), 1990; Gleser, 1994.

Many European nations monitor alcohol consumption levels among the young because alcohol problems have historically taken a high toll on young people. The Health Behaviour in Schoolchildren study, supported by the WHO Regional Office for Europe, included questions about alcohol use in its survey of 15-year-olds in 13 countries in 1993 and 1994. As Table 11 shows, with the exception of Israel, most young people in these countries have tried alcohol. National differences show up in frequency of drinking and intoxication.

Table 11. Drinking among schoolchildren, aged 15 years, in selected European countries, 1993-1994

COUNTRY	LIFETIME		WEEKLY		DRUNK AT LEAST TWICE	
	M (%)	F (%)	M (%)	F (%)	M (%)	F (%)
Austria	96.2	94.6	40.2	24.9	45.6	30.4
Denmark	94.9	95.6	40.1	33.4	64.7	66.7
Estonia	92.5	91.9	13.2	3.3	25.8	9.6
Finland	92.0	92.3	12.9	5.0	52.0	51.1
France	88.9	89.9	38.0	17.5	23.8	12.9
Greece	83.1	87.1	8.3	7.5	46.3	46.4
Hungary	93.3	93.6	22.8	13.4	35.5	19.7
Israel	68.2	52.6	22.8	10.4	8.1	5.6
Latvia	93.2	93.1	16.1	3.2	-	-
Lithuania	95.3	95.1	13.8	5.7	27.3	16.5
Poland	89.5	87.8	22.0	9.2	33.5	18.0
Russian Federation (St. Petersburg)	80.0	83.5	17.3	6.2	20.8	12.3
Slovakia	95.4	93.0	33.0	10.3	46.3	20.2

Source: World Health Organization Regional Office for Europe. Health Behaviour in School Children Study 1993/1994. Data supplied by Dr. Bente Wold, WHO Collaborating Centre, University of Bergen, Norway.

In most of the wealthier nations of Western Europe, both weekly drinking and intoxication are much more common, excluding France where young people drink and become intoxicated less frequently. However, in Western Europe as elsewhere, the strong differences between male and female drinking patterns remain in place, with the exception of Denmark, where nearly two-thirds of all schoolchildren have been intoxicated at least twice, and where girls drink almost as frequently and are slightly more likely than boys to have drunk to intoxication. Experimentation with alcohol is just as common among young people in the Central and Eastern European countries reported on here, but both weekly drinking and drinking to intoxication tend to be less common.

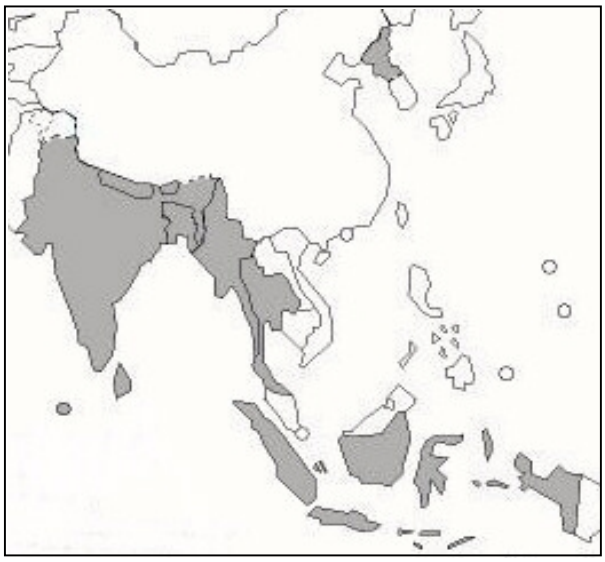
The European School Survey Project on Alcohol and Other Drugs (ESPAD) used a standardized data collection instrument and consistent survey methodologies in a larger group of countries in the spring of 1995, in an effort to produce comparable results. The study produced standardized data in 25 European countries. As Table 12 below shows, the results are similar to those found earlier by WHO. With the exception of Turkey, more than three-quarters of the young people surveyed have tried alcohol. Drinking and drinking to intoxication tends to be more common among boys, although there are exceptions. However, the tendency among males of any age to drink more heavily than females shows up in the statistics on the percentage of young people who have been drunk in the past thirty days: in this case, only male young men in Finland, Iceland, Norway and Sweden are less likely to have been drunk in the past 30 days than their female peers.

Table 12. Alcohol use among 15 to 16-year-olds in selected European countries, 1995

	LIFETIME PREVALENCE			30-DAY PREVALENCE			DRUNK IN PAST 30 DAYS		
Country	M (%)	F (%)	Total (%)	M (%)	F (%)	Total (%)	M (%)	F (%)	Total (%)
Croatia	85	79	82	48	27	39	20	6	13
Cyprus	92	88	90	79	60	69	12	8	10
Czech Republic	97	97	97	68	66	67	35	26	31
Denmark	97	95	96	82	81	81	58	58	58
Estonia	94	93	93	51	50	51	27	15	20
Faroe Islands	79	80	79	47	43	45	35	33	34
Finland	88	89	89	55	61	58	49	54	51
Hungary	92	91	91	52	44	48	26	15	20
Iceland	78	80	79	55	56	56	44	48	46
Ireland	91	91	91	69	69	69	43	41	42
Italy	89	86	88	73	55	66	22	12	19
Lithuania	94	95	95	57	62	59	38	31	35
Malta	92	92	92	69	63	66	17	11	14
Norway	79	80	79	41	45	43	29	32	30
Poland	93	90	92	60	48	54	31	17	23
Portugal	80	78	79	54	45	49	13	10	11
Slovak Republic	96	94	96	55	49	53	25	13	19
Slovenia	88	86	87	49	44	46	25	18	21
Sweden	89	89	89	55	56	55	39	43	41
Turkey (Istanbul)	62	60	61	32	23	28	14	7	11
Ukraine	86	88	87	52	57	55	16	11	13
United Kingdom	94	94	94	74	73	74	48	48	48
Latvia	93	94	93	53	60	57	25	17	20
France	76	80	78	-	-	-	-	-	-
Greece	96	95	95	79	69	74	16	15	16

Source: Hibell et al., 1997

South-East Asian Region



Few general population surveys measuring alcohol consumption have been conducted in the countries of the South-East Asian Region. In the region's largest country, India, national survey data were not available. India is regionally extremely diverse, and extrapolation from regional data must be carried out with care. Nonetheless, regional surveys in both the Southern and the Northern regions of the country have found very low rates of alcohol use among women, while the rates of current alcohol use among men range from 34.8 to 58.3 per cent (Mohan et al., 1992, Sundaram et al., 1984; Singh, 1984). Although as many as 10 per cent of the population has been estimated to drink heavily, the only survey research to measure this found that in the Southern Indian state of Kerala, 34.8 per cent of men drink more than 60 grams of alcohol per week (a relatively low measure of "heavy drinking" by international standards[2]) (Beegom et al., 1995). Among young people, use

[2] See WHO, in press, for further discussion of recommended definitions for measures of quantities of drinking.

appears to increase with age and educational level. Studies in the late 1970s and early 1980s found that 12.7 per cent of high school students, 32.6 per cent of university students, between 40 and 60 per cent of medical students, and 31.6 of non-student young people used alcohol (Saxena, 1997). Several Indian states have recently experimented with prohibition of alcohol, while the federal government has taken steps to loosen controls over alcohol production and trade. With all these changes in policies regarding alcohol availability, it is likely that prevalence of drinking will change as well, although there is no recent research available to suggest the direction of those changes.

Elsewhere in the region, religion is a strong predictor of alcohol use. In predominantly Muslim Indonesia, an estimated 2.7 per cent of the population drink alcohol regularly (Boedhi-Dermojo et al., 1990). In Maldives, also a Muslim nation, alcohol use is prohibited, and there are no data available on prevalence; however, tourist and guest worker alcohol consumption combined with a relatively small resident adult population accounts for the country's per capita alcohol consumption rate of just over 2 litres of pure alcohol per adult. Caste or ethnic grouping may also predict alcohol use. In Nepal, those designated *Matwali* may drink alcoholic beverages by virtue of their birth. There are reports that the number of people in this category is rising (Shrestha, 1992). Alcohol use is considered an integral part of most social occasions among many ethnic groups, and drunkenness among men is frequent and tolerated, whereas female drunkenness is not. In Bhuta, alcohol is integrated into cultural and religious ceremonies. However, there is no information available on the extent of alcohol use among the population. In Thailand, a predominantly Buddhist country, a 1991 national survey found that 31.4 per cent of all adults consumed alcohol, while a 1996 survey estimated that daily drinkers comprised 2.2 per cent of the population (Saxena, 1997; Ministry of Health Thailand, 1997).

Several surveys have been conducted in various districts of Sri Lanka. Lifetime prevalence of alcohol use ranges from 25 to 34 per cent of adults, and current use from 20 to 32 per cent. Less than four per cent of women drink (Alcohol and Drug Information Centre, 1993). Alcohol use tends to be higher in poorer families. In rural areas, those who drink tend to do so heavily (Hettige, 1991; Gunasekera & Perera, 1997). In one survey, 35 per cent of drinkers had experienced inability to control their alcohol use (Hettige, 1991). Among young people between the ages of 12 and 20 years, life time use ranges among the districts from 19 to 29 per cent, while current use varies from 3.9 to 17.2 per cent. Most young drinkers are male, and more than a quarter had begun drinking by the age of 11 years (Alcohol and Drug Information Centre, 1993).

Western Pacific Region

Data on prevalence of drinking alcohol among adults or young people exist for 11 of the 28 countries in the region. Table 13 below shows survey-based prevalence of adult drinking estimates for the countries for which data are available. In New Zealand and Australia, where populations of European origin dominate, differences between male and female drinking prevalences are slight; in contrast, men in China, Fiji, Japan, Korea, on the island of Weene in the Federated States of Micronesia and in urban Papua New Guinea are far more likely to use alcohol. Singapore reports very low prevalence of drinking, with only 13.2 per cent of Chinese, 1.1 per cent of Malays and 20.9 per cent of Indians using alcohol at least once a week (Hughes et al., 1990). In neighbouring Malaysia, there are no general population surveys available. Studies of persons attending medical facilities, which are likely to overstate drinking in the general population, have found that between 52 and 70 per cent of Malaysians of Chinese origin, between 38 and 42 per cent of

Malaysians of Indian origin, and between 11 and 24 per cent of Malaysians of Malay origin are drinkers (Indran, 1993; Maniam, 1994).

Table 13. Adult drinking prevalence in selected countries of the Western Pacific Region

COUNTRY	PREVALENCE	MALE (%)	FEMALE (%)	TOTAL (%)
Australia (Drugs of Dependence Branch [Australia], 1996)	Annual	80.0	72.0	76.0
China (Hao & Young, 1997)	Annual	87.3	31.5	61.1
Fiji (National Food and Nutrition Committee [Fiji], 1995)	Weekly	25.7	2.5	13.7
Japan (Yamamuro, 1993)	Annual	85.0	53.0	69.0
Micronesia (Chuuk) (Marshall, 1987)	Lifetime	85.5	2.3	45.2
New Zealand (Wyllie, Millard & Zhang, 1996)	Annual	89.0	85.0	-
Palau (Ueda, 1998)	Annual	53.0	-	40.0
Papua New Guinea (urban) (Marshall, 1997)	Lifetime	78.0	13.5	-
Republic of Korea (Ministry of Health and Welfare [Republic of Korea], 1998)	Monthly	83.0	44.6	63.1

In Australia and New Zealand, overall rates of drinking are, in the main, stable or falling while in Japan, during the 1980s, the percentage of men drinking grew by 15 per cent, and the percentage of women drinkers nearly tripled (Drugs of Dependence Branch, Australia, 1996; Wyllie, Millard & Zhang, 1996; Yamamuro, 1993). Heavy drinkers generally account for the largest share of alcohol consumption: in New Zealand, for example, the predominantly male (83 per cent) heaviest drinking 10 per cent of drinkers consumed almost half the total alcohol sold (Wyllie, Millard & Zhang, 1996). Heavy drinking is also common among men in some of the Pacific islands. Half of all current drinkers in the community of the island of Weene (formerly Moen) in the state of Chuuk in the Federated States of Micronesia reported consuming 10 or more drinks per session, while more than 60 per cent took seven or more drinks per session (Marshall, 1987). Men in Papua New Guinea typically drink in groups of other men, beginning in their mid to late teens. The goal is usually to get drunk, and consumption of 12 or more bottles of beer at a sitting is typical (Marshall, 1997).

Table 14. Youth drinking prevalence in selected countries in the Western Pacific Region

COUNTRY	PREVALENCE	MALE (%)	FEMALE (%)	TOTAL (%)	AGE
Australia (Hill et al., 1993)	Weekly	51.0	46.0	-	17 years
Japan (Suzuki et al., 1991)	Lifetime	76	83.0	-	2nd year high school
Malaysia (Hoo & Navaratnam, 1988)	Annual	-	-	11.3	13 to 15 years
New Zealand (Fergusson, Lynskey & Horwood, 1994)	Annual	-	-	71.6	15 years
Papua New Guinea (Marshall, 1997)	Lifetime	39.0	14.0	-	Average age of 16 years
Philippines (Mendoza & Ponce, 1991)	Annual	18.6	18.6	18.6	13 to 16 years
Republic of Korea (Ministry of Health and Welfare [Republic of Korea], 1998)	Monthly	-	-	26.9	High school students

In the developed countries of the region, large proportions of young people are drinking. In Australia and New Zealand, those under 25 years of age are most likely to be the heaviest drinkers (Drugs of Dependence Branch, Australia, 1996; Wyllie, Millard & Zhang, 1996). Studies show that Australian males aged 20 to 24 years drink 70 grams or more on a typical drinking day. Fifty per cent of Australian boys and 46 per cent of girls drink weekly, with the boys averaging 70 grams of pure alcohol per week, and the girls averaging 45 grams weekly (Hill et al., 1993). In New Zealand, more than half of a sample of 15-year-olds in Christchurch said that a typical drinking session involved consuming at least 30 grams of pure alcohol (Fergusson, Lynskey & Horwood, 1994). A national sample of teenagers aged 14 to 18 years found that 28 per cent reported drinking 40 grams or more

(defined as binge drinking) in the past fortnight, while 34 per cent reported doing so the last time they drank (Boyd, 1998). A national survey in 1993 in Japan found that more than 80 per cent of school children between the ages of 13 and 17 years were drinking, and that 55 per cent of them had done so to intoxication or unconsciousness (Brazeau & Burr, 1993). Where statistics are available, it can be seen that smaller proportions of young people drink in the developing countries. In the Republic of Korea youth prevalence of drinking has been increasing steadily in recent years (Ministry of Health and Welfare, Republic of Korea, 1998).

Alcohol industry

Tables 15 and 16 show the global dispersion of alcohol production and trade in 1996. Table 15 shows that several of the leading alcohol-producing countries are located in the developing world, notably China which produced more beer than any other country. The vast majority of that production is consumed in domestic markets, and, therefore, alcohol contributes little to developing country export earnings. Only approximately 10 per cent of alcoholic beverage production goes into international trade (based on FAO data, 1998). The bulk of trade occurs between the developed countries, and both on the import and export side, a few countries tend to dominate the trade. For instance, the ten countries exporting the most spirits, beer and wine account for 70, 75 and 84 per cent of global exports of these products, respectively.

Table 15. Leading alcohol producing countries, 1996

BEER		SPIRITS		WINE	
Country	Production (Metric Tons)	Country	Production (Metric Tons)	Country	Production (Metric Tons)
USA	23 700 000	China	9 975 400	France	5 965 000
China	17 207 270	India	1 474 793	Italy	5 877 181
Germany	10 780 000	Republic of Korea	1 400 240	Spain	2 987 040
Japan	6 804 500	USA	1 100 000	USA	1 887 700
Brazil	6 500 000	United Kingdom	921 500	Argentina	1 268 100
United Kingdom	5 800 500	Japan	850 800	Portugal	952 877
Mexico	4 721 140	Thailand	804 120	South Africa	940 000
Spain	2 500 000	Russian Federation	716 300	Germany	864 199
Netherlands	2 335 200	Brazil	670 000	Australia	673 445
Canada	2 326 000	Philippines	560 000	Romania	580 000

Source: FAO Statistical Databases 1998

Table 16. Leading importers and exporters of alcohol, 1996

SPIRITS (METRIC TONS)			
Country	Exports	Country	Imports
United Kingdom	651 151	United States of America	381 324
France	377 779	Germany	166 102
Germany	190 903	Spain	148 702
Netherlands	126 981	France	143 662
Ukraine	126 000	Japan	133 259
Italy	116 382	United Kingdom	92 793
United States of America	109 617	Ukraine	79 000
Hungary	97 451	Belarus	67 460
Mexico	80 601	Italy	58 454
Ireland	79 962	Netherlands	47 902

Table 16. Continued

BEER (METRIC TONS)			
Country	Exports	Country	Imports
Netherlands	1 197 482	United States of America	1 457 985
Germany	837 871	United Kingdom	541 961
United States of America	598 715	France	430 190
Mexico	491 648	Italy	306 913
Luxembourg	431 992	Germany	302 070
Canada	361 416	Hong Kong*	208 782
Ireland	325 229	Brazil	189 876
Denmark	283 497	Japan	186 655
United Kingdom	234 553	Spain	186 212
Czech Republic	212 136	China	168 196
WINE (METRIC TONS)			
Country	Exports	Country	Imports
Italy	1 459 120	Germany	1 123 460
France	1 308 695	United Kingdom	740 223
Spain	720 214	France	528 887
Germany	262 646	United States of America	355 437
Australia	234 270	Russian Federation	250 221
Chile	203 432	Luxembourg	243 726
Portugal	195 114	Netherlands	217 110
Bulgaria	183 470	Switzerland	185 439
United States of America	164 905	Canada	173 213
Republic of Moldova	162 679	Denmark	152 273

**China, Hong Kong SAR.*
Source: FAO Statistical Databases 1998

An analysis of the value of international trade in alcohol shows even more clearly the dominance of developed nations. Table 17 shows that the four leading alcoholic beverage importing countries, the USA, the UK, Germany and Japan, account for nearly half of the US dollars spent on alcoholic beverage imports (based on data from 48 countries). However, this does not mean that the alcohol trade is insignificant in developing economies. When ranked by how large a percentage of total import costs are paid for alcoholic beverages, as in Table 18, of the 39 countries for which data were available, developing economies and economies in transition, such as the Russian Federation, dominate.

Table 17. Leading alcoholic beverage-importing countries in 1995, ranked by costs of imports

COUNTRY	IMPORTS (US$ 000)	PER CENT OF TOTAL IMPORT COSTS
United States of America	4 498 130	0.58
United Kingdom	2 860 506	1.08
Germany	2 612 925	0.58
Japan	1 955 886	0.58
Russian Federation	1 398 274	3.00
France	1 304 234	0.47
Spain	1 068 446	0.93
Belgium	1 038 076	-
Netherlands	839 867	0.48
Italy	716 888	0.35

Source: Department for Economic and Social Information and Policy Analysis Statistical Division. 1995 International Trade Statistics Yearbook Volume II: Trade by Commodity. (New York, United Nations 1996)

Table 18. Leading alcoholic beverage-importing countries in 1995, ranked by per cent of total import costs

COUNTRY	IMPORTS (US$ 000)	PER CENT OF TOTAL IMPORT COSTS
Russian Federation	1 398 274	3.00
Guadeloupe	46 205	2.44
United Republic of Tanzania	38 902	2.32
Macau	41 530	2.06
Ukraine	166 346	1.55
Martinique	29 699	1.51
Reunion	34 801	1.32
United Kingdom	2 860 506	1.08
Denmark	413 560	0.96
Bahrain	34 464	0.95

Source: Department for Economic and Social Information and Policy Analysis Statistical Division. 1995 International Trade Statistics Yearbook Volume II: Trade by Commodity. (New York, United Nations 1996)

In contrast, export earnings are dominated by developed countries. Table 19 shows that ten developed countries earn the greatest amounts from alcoholic beverage exports accounting for nearly 80 per cent of all such earnings, based on the 49 countries from which data were available. Table 20 shows that when ranked by the percentage of total export earnings gained from alcoholic beverages, developing countries and economies in transition dominate the rankings, based on the 43 countries for which data were available.

Table 19. Leading alcoholic beverage-exporting countries in 1995, ranked by export earnings

COUNTRY	EXPORTS (US$ 000)	PER CENT OF TOTAL EXPORT EARNINGS
France	7 193 629	2.51
United Kingdom	4 493 014	1.86
Italy	2 598 448	1.12
Germany	1 706 067	0.33
Netherlands	1 395 173	0.71
Spain	1 141 783	1.25
United States of America	1 083 713	0.19
Ireland	611 464	1.39
Belgium	582 962	-
Canada	562 308	0.29

Source: Department for Economic and Social Information and Policy Analysis Statistical Division. 1995 International Trade Statistics Yearbook Volume II: Trade by Commodity. (New York, United Nations 1996)

Table 20. Leading alcoholic beverage-exporting countries in 1995, ranked by percentage of total export earnings

COUNTRY	EXPORTS (US$ 000)	PER CENT OF TOTAL EXPORT EARNINGS
Republic of Moldova	173 025	24.03
Martinique	24 216	10.81
Bulgaria	185 804	3.65
Cyprus	42 323	3.44
France	7 193 629	2.51
Portugal	548 208	2.41
United Kingdom	4 493 014	1.86
Ireland	611 464	1.39
Spain	1 141 783	1.25
Croatia	57 471	1.24

Source: Department for Economic and Social Information and Policy Analysis Statistical Division. 1995 International Trade Statistics Yearbook Volume II: Trade by Commodity. (New York, United Nations 1996)

These tables illustrate that in developing countries, and countries in transition, export earnings are relatively low in global terms, yet these earnings are an important part of the total income in these countries. Products and profits in the international alcohol trade flow primarily into the developed

countries and countries in transition. These flows are dictated and protected by the structure of the international alcohol industry.

As Tables 15 and 16 illustrate, there are three main alcohol industries worldwide: beer, spirits and wine. Although the global structure of each is unique, there are some common trends. The dominant trend in the global alcohol industry, as in most industries, has been away from labour-intensive products with little brand identity and decentralized production, and towards capital-intensive production of global brands heavily supported by marketing budgets. This has particularly been true of beer, which can be produced almost anywhere, less true of spirits, and least true of wine which has the most exacting geographic requirements for production (although wine is reportedly beginning to follow this trend as well (Barry, 1998). In each category, there is a plethora of local alcohol products, produced labour-intensively with relatively low levels of technology and sold with comparatively low prices. Higher profits have come from the creation of a small number of international brands whose production and marketing are far more capital-intensive, taking advantage of economies of scale in these areas.

Concentration of ownership is a general trend. The world's leading brewers, via licensing, joint ventures, contract brewing, mergers and acquisitions, now produce more than a third of the world's beer. Their share of the world's beer market has grown from 28 per cent in 1980 to 36 per cent in 1997 (Cavanagh & Clairmonte, 1985; Zweibach, 1998). Global spirits brands comprise 46 per cent of spirits sales worldwide, and ten companies account for more than half these sales (Impact Databank, 1995; Fleming, 1998). The companies producing these brands are for the most part located in developed nations, and rank among the world's largest transnational corporations. They rely on large marketing budgets to maintain market dominance, and gain oligopoly profits by doing so. The largest spirits company in the world spent US$ 1.2 billion marketing its spirits brands in 1997 to earn profits of US$ 1.8 billion (Fleming, 1998).

Low-technology and labour-intensive production of alcoholic beverages still dominates in many developing countries, particularly in Africa. It sometimes carries with it substantial health risks from products of highly variable quality, with little control exercised over hygiene in the production process or over substances added to the beverage to increase its intoxicating effects on the drinker. In many of the countries of Central and Eastern Europe, this end of the market has experienced a resurgence since the collapse of central market controls.

This mode of production creates particular challenges to health and development. The first challenge from a health perspective in these situations is to gain some degree of control over production and the market, the former so that product quality may be assured, and the latter so that control measures such as taxation may be employed to influence alcohol consumption patterns. From a development perspective, in parts of Africa, home or small-scale local production particularly of beer but also of local spirits products is an important source of income for women, especially those who are single heads of households (Colson & Scudder, 1988; Maula, 1997). Industrialization of the alcohol supply can eliminate this source of income, necessitating creation of other forms of employment and income if poverty among rural women and children is to be avoided.

In areas where industrialization has taken hold, issues of product quality and market control are of less importance. In addition to the economic advantages of more efficient means of production, in some cases cultural and macro-economic factors have contributed to the transition from small-scale to more complex industrial production of alcohol in the developing world. European or American-style marketing and patterns of status imitation have furthered the popularity of imported industrialized alcoholic beverages, which have then become candidates for import substitution. In practice, however, import substitution has brought fewer economic benefits than might have been anticipated. African countries in the 1980s, for instance, ended up importing many of the raw materials needed for brewing lager-style (European-style) beer, offsetting any gains from import substitution (Kortteinen, 1986). Also, the global brand owners in the beer and spirits categories have kept tight control over their products. Although they may not directly control production of their products, they are likely to dictate marketing approaches to promote a consistent product image worldwide. Sophisticated market research tools combined with the use of religious and cultural symbols, coupon and sweepstakes schemes, sexual innuendoes and health and strength claims, have been used to encourage consumption of the companies' products (Jernigan, 1997).

The ability and willingness of the global producers to spend heavily to maintain product image create high barriers to entry for other firms, whether local or international, wishing to move into the more profitable end of the market. This supports the dominance of the market by a few firms and a few products, accelerating the trend towards concentration in ownership of the alcohol supply worldwide. The health danger of this concentration lies in the economic and political influence that may accrue to the leading companies. This may give them the potential to block or temper efforts to control alcohol consumption and problems at the same time that they rely on huge marketing budgets to encourage consumption of their products.

The global alcohol-producing transnationals have spent decades honing their marketing expertise in developed country markets. Developed countries in many cases have well-developed public health and regulatory environments to temper the health effects of this marketing. In at least some developing country markets, the international marketers use campaigns and tactics that would be unacceptable in their home markets, selling alcohol as a tonic for new mothers or as a product that will make drinkers stronger and healthier (Jernigan, 1997). Developing a policy infrastructure able to monitor and regulate alcohol markets is an important modern public health challenge.

Health effects[1]

Alcohol use is related to a wide range of physical, mental and social harms. Most health professionals now agree that practically no organ in the body is immune from alcohol related harm (Bower, 1992). In any country where there is heavy alcohol use, whether on occasion or over extended periods, alcohol related problems can be expected. Some meta-analytic work has been attempted to estimate the degree to which various health and social problems are attributable to alcohol use. A number of conditions have been identified that by definition are caused by alcohol use, such as alcoholic psychosis, alcohol dependence syndrome, alcohol abuse, alcoholic polyneuropathy, alcoholic cardiomyopathy, alcoholic gastritis, alcoholic liver cirrhosis, and ethanol toxicity and methanol toxicity. Other conditions or events have also been identified where the fraction attributable to alcohol was in excess of 30 per cent, these included oesophageal varices, unspecified cirrhosis, chronic pancreatitis, road injuries, fall injuries, fire injuries, drowning, suicide and homicide (English et al., 1995).

Research over the past two decades has found that the level of alcohol problems is related both to the overall amount of drinking in the country (per capita alcohol consumption) and to the particular patterns of drinking (Edwards et al., 1994). Alcohol consumption is associated with higher death rates from injuries (CDC, 1995; Andreasson, Allebeck & Römelsjö, 1988); violence and suicide at least in some cultures (Andreasson, Allebeck & Römelsjö, 1988); poisoning (Anderson, 1995); haemorrhagic stroke (Donahue et al., 1986; Klatsky, 1989); and pancreatitis (Singh & Simsek, 1990); as well as cancers of the oral cavity, pharynx, larynx, oesophagus, liver (IARC, 1988), and breast (Smith-Warner et al., 1998). Studies have also found statistically significant associations between changes in per capita or aggregate consumption of alcohol and changes in liver cirrhosis and pancreatitis mortality (Skog, 1986; Norström, 1987). Research has also found a decrease in all-cause mortality among certain light-to-moderate drinkers of alcoholic beverages compared to non-drinkers or heavier drinkers (Stampfer et al., 1988; Blackwelder et al., 1980; Boffetta & Garfinkel, 1990; Camacho, Kaplan & Cohen, 1987; de Labry et al., 1992; Doll et al., 1994; Farchi et al., 1992; Friedman & Kimball, 1986; Fuchs et al., 1995; Gazanio et al., 1993; Gordon & Doyle, 1987; Klatsky, Armstrong & Friedman, 1990; Kono et al., 1986; Marmot and Brunner, 1991; Miller et al., 1990; Rimm et al., 1991; Salonen, Puska & Nissinen, 1983; Shaper, Wannamethee & Walker, 1988; Klatsky, Armstrong & Friedman, 1997; Thun et al., 1997). There are also recent studies that do not find this effect (Fillmore et al., 1998a; Leino et al., 1998; Fillmore et al., 1998b).

Protective effects

Where it has been found, the decrease in all-cause mortality – the so called "protective effect" - results primarily from a reduction in coronary heart disease (CHD), a leading cause of death among people in the latter half of life, particularly in the developed countries (Doll et al. 1994; Thun et al., 1997; Jackson, Scragg & Beaglehole, 1991). The level of alcohol consumption in studies that have found a reduction in all-cause mortality among light-to-moderate drinkers ranges from less than one drink a day to five, with one being the most frequently reported (Poikolainen, 1995). Evidence of a protective effect at low levels of alcohol consumption has also been found for ischemic stroke (Rodgers et al, 1993; Palomaki & Kaste, 1993; Bogousslavsky et al., 1990), cholelithiasis (gallstones) (Thornton, Heaton & Syme, 1986; English et al., 1995), and non-insulin dependent diabetes mellitus (Rimm et al.,

[1] This section benefits from reviews prepared by Dr. Harold Holder and Dr. Eric Single for the International Guidelines for Monitoring Alcohol Use and Problems project, and by Dr. Klaus Mäkelä for the Alcohol Policies in Developing Societies project.

1995; Kiechl et al., 1996). The impact of alcohol on all-cause mortality is affected by the prevalence of different diseases and injuries, the age structure of the population and the level of alcohol consumption at the societal level. There is a positive, largely linear relationship between reported alcohol consumption and total mortality in populations or groups with low CHD rates (which includes younger people everywhere). On the other hand, there is a J- or U-shaped relationship between reported usual alcohol consumption and total mortality in populations with high rates of CHD (WHO, 1995). While the findings of a protective effect for CHD have been widely publicized, the limits on their potential applicability should be clearly recognized. CHD is an important cause of death and disability in most developed societies, but not in many developing societies. Where CHD is important, it primarily affects men over age 45 and women past menopause, and any protective effect of drinking at younger ages is highly speculative. How much other protective factors may substitute for alcohol's protective effect has not been well studied.

Although some clinicians remain unconvinced of alcohol's protective effect either on total or on cardiovascular mortality (e.g. Wannamethee & Shaper, 1997; Whitaker & Ward, 1996; Deev et al., 1998), the predominant expert judgement at the time of writing is that, among populations at high risk of heart disease (primarily those who are middle-aged or older in societies with risky levels of smoking, animal fat in the diet, and sedentariness), drinking alcohol in amounts between 5 and 20 grams per day (i.e. an average of one-half to two drinks) has some protective effect. However, there are very few clinicians who would give this finding the status of a prescription to non-drinkers to begin drinking, because of the other risks associated with alcohol consumption.

Effects on others

In addition to the effects of alcohol on the drinker, there is considerable evidence of the effect of alcohol consumption on the health of people other than the drinker in areas such as motor vehicle crash injuries, violence involving aggravated assault, and spouse and child abuse. The public health impact of alcohol on others is of great importance in both developed and developing countries. As association between drinking and some forms of victimization, including robbery, rape and aggressive behaviour is consistently reported in the literature (Edwards et al., 1994). Particularly in developing countries, alcohol consumption may lead to significant effects on the health of the drinker's family, through financial difficulties arising when a large part of the family's income is spent on alcohol, aggravated by poor living conditions and malnutrition (Saxena, 1997).

Indicators of alcohol-related harm

Identifying meaningful indicators for monitoring alcohol-related harm requires understanding of the nature of causality in alcohol-related problems. For most alcohol problems, drinking is not the single cause, but part of a constellation of factors that lead to increased risk of harm, and eventually to harm itself. Alcohol use is one of the factors that increases risk of harm occurring, either to the drinker or to those around him or her. In the case of drinking-driving, for example, causal factors influencing both incidence and severity of injury may include road conditions, driver experience and eyesight, speed, the presence of safety features such as seatbelts or airbags. Similarly, liver cirrhosis may be caused by infectious agents (such as the hepatitis B and C viruses now epidemic among injection drug users in some countries), and incidence or progression may also be influenced by genetic predisposition. A substantial literature has developed reviewing the degree to which alcohol use may be considered a conditional cause in situations involving multiple causes. The question can be asked, would the disorder have occurred if the alcohol had not been present. For most potentially alcohol-related conditions, many cases also occur without alcohol involvement. Using techniques of meta-analysis to review and assess results from many studies, researchers have developed estimates of alcohol-attributable fractions for leading disorders. The studies on which the meta-analyses are based have been done on a tiny portion of the global spectrum of cultures. The real fraction of drowning attributable to alcohol, for instance, will vary from one society to another, depending on whether and, how much, people drink near or on water. The variation around intentional casualties – homicide and suicide – will be even greater. Even for non-casualties, the fraction will vary from one place to

another, e.g. for non-specified cirrhosis. Table 21 shows the conditions which have had attributable fractions assigned to them in three meta-analyses.

Table 21. Alcohol-attributable fractions of disorders tracked by WHO global alcohol monitoring database

DISORDER	ICD-9	ENGLISH ET AL. 1995	SCHULZ ET AL. 1991	SINGLE ET AL. 1998
Acute pancreatitis	577.0	0.24	0.42(2)	0.24
Alcohol abuse	305.0	1.00	1.00(1)	1.00
Alcohol dependence	303.0	1.00	1.00(1)	1.00
Alcoholic beverage poisoning	E860.0	1.00	1.00(1)	1.00
Alcoholic cardiomyopathy	425.5	1.00	1.00(1)	1.00
Alcoholic cirrhosis of liver	571.0-571.3	1.00	1.00(1)	1.00
Alcoholic polyneuropathy	357.5	1.00	1.00(1)	1.00
Alcoholic psychosis	291.0	1.00	1.00(1)	1.00
Aspiration	E911	1.00(1)	0.25(1)	0.25
Burns	E890-E899	0.44	0.45(3)	0.375
Chronic pancreatitis	577.1	0.84	0.60(2)	0.84
Drownings	E910	0.34	0.38(1)	0.299(m), 0.227(f)
Ethanol/methanol toxicity	980.0-980.1	1.00(1)	1.00(1,3)	1.00
Falls	E880-E888	0.34	0.35(1)	0.238(m), 0.152(f)
Gastritis caused by alcohol	535.3	1.00	1.00(1)	1.00
Homicide and purposeful injury	E960,65,66,68,69	0.47	0.46(1)	0.27
Motor vehicle traffic crash deaths	E810-E819	0.37(m), 0.18(f)	0.42(1)	0.43
Oesophageal varices	-	0.54 (m), 0.43 (f)	-	-
Suicide	E950-E959	0.41(m), 0.16(f)	0.28(1)	0.272(m), 0.168(f)
Unspecific cirrhosis of liver	517.5-571.9	0.54(m), 0.43(f)	0.50(1)	0.54

[1]Age range 15-85 years or older.
[2]Age range 35-85 years or older
[3]Age range 0-85 years or older
Adapted from WHO, unpublished,; English et al. 1995; Schultz et al. 1991 and Single et al. 1998.

Using standard populations to adjust for differences in national age structures, WHO has calculated standardized death rates (SDRs) for the major causes of alcohol-related death. Using globally standardized populations tends to inflate the rates for developing countries beyond the actual number of deaths, because the age structures there tend toward younger ages, while some of the conditions happen primarily in later years. The overall rate of adult per capita consumption of alcohol, and the quantities and frequencies with which the alcohol is consumed, influence whether chronic or acute consequences of alcohol are most salient in each country.

Chronic consequences of alcohol use

There are no categories of disease or injury that are completely reliable indicators for the level of alcohol-related harm in a society. Problems of under-reporting on the one hand and anecdotal over-attribution on the other abound. The most commonly reported mortality category that is fully alcohol-caused is alcohol dependence syndrome. Alcohol dependence syndrome is the name of the disorder category assigned to deaths in which heavy drinking is somehow involved. In practice, it may be used to refer to a fatal overdose, or to a history of heavy drinking which is considered to have caused the death. Coding practices for this category vary from one place to another, and the meaningfulness of comparisons between one country and another is questionable. US researchers have identified several common reasons for under-reporting of alcohol dependence, including patient denial; provider failure to take a drinking history; lack of accurate laboratory tests measuring long-term heavy alcohol consumption; and reluctance to use the diagnosis to avoid stigmatizing the patient or patient's family (Dufour & Caces, 1993).The latter is also reportedly true in other cultures. In reporting alcohol dependence as a principal cause of death, these factors and resultant under-reporting may only be

exacerbated. Despite the limitations of reported alcohol dependence as an indicator of actual alcohol use, these statistics are important from a global perspective, because there is sufficient reporting to permit some cross-national comparisons. Recent data were available from 51 countries. Table 22 below uses age-standardized population estimates to calculate standardized death rates (SDRs, based on world standard populations) per 100 000 population for these countries.

Table 22. SDR (per 100 000 population) for alcohol dependence syndrome ICD-9 Code 303

COUNTRY	YEAR	TOTAL	MALES	FEMALES
Lithuania	1997	10.0	16.2	4.8
Hungary	1997	7.6	13.7	2.4
Latvia	1996	7.2	11.9	3.3
Mauritius	1996	6.3	12.4	0.5
Romania	1996	6.2	10.7	2.0
Luxembourg	1997	5.5	8.3	2.8
Germany	1997	4.8	7.7	2.0
Denmark	1996	3.9	6.3	1.6
Mexico	1995	3.8	7.6	0.5
Norway	1995	3.8	6.5	1.3
Croatia	1996	3.4	6.4	1.0
Finland	1996	3.3	5.8	0.9
Republic of Moldova	1996	3.2	5.5	1.3
Poland	1996	3.1	5.9	0.5
Kazakhstan	1996	2.8	4.5	1.4
France	1996	2.8	4.7	1.0
Argentina	1993	2.7	5.2	0.6
Republic of Korea	1995	2.6	5.2	0.3
Austria	1997	2.5	4.1	0.9
Bahamas	1995	2.4	2.2	2.6
Slovenia	1996	2.3	4.1	0.8
Sweden	1996	2.1	3.5	0.9
Belize	1995	2.0	4.0	0.0
Chile	1994	1.9	3.6	0.3
Venezuela	1994	1.9	3.7	0.1
United States of America	1996	1.6	2.7	0.7
Belgium	1992	1.5	2.4	0.7
Canada	1995	1.4	2.2	0.7
Turkmenistan	1993	1.3	2.1	0.6
Trinidad and Tobago	1994	1.2	1.7	0.7
Bulgaria	1994	1.2	2.3	0.1
Estonia	1996	1.2	2.1	0.4
Ireland	1995	1.1	1.3	0.9
Thailand	1994	1.1	2.0	0.3
Australia	1995	1.0	1.5	0.4
Cuba	1995	1.0	2.0	0.1
Netherlands	1997	0.9	1.6	0.3
United Kingdom	1997	0.8	1.1	0.5
Costa Rica	1994	0.8	1.6	0.0
Former Yugoslav Republic of Macedonia	1997	0.7	1.3	0.1
Barbados	1995	0.5	1.2	0.0
Israel	1996	0.5	1.1	0.0
Italy	1993	0.4	0.6	0.1

Table 22. Continued

COUNTRY	YEAR	TOTAL	MALES	FEMALES
Slovakia	1995	0.4	0.6	0.1
Spain	1995	0.4	0.8	0.1
Czech Republic	1997	0.3	0.4	0.1
Portugal	1996	0.3	0.6	0.1
Japan	1997	0.3	0.5	0.1
Greece	1997	0.2	0.4	0.0
New Zealand	1994	0.2	0.5	0.0
Colombia	1994	0.1	0.2	0.0

Source: WHO Global Programme on Evidence and Information for Health Policy

Cirrhosis of the liver is another commonly used indicator of the long-term health impact of alcohol use or of the amount of heavy alcohol consumption occurring in a population (Bruun et al., 1975; Edwards et al., 1994). In non-tropical developed countries with substantial alcohol consumption, alcohol is likely to cause more than 80 per cent of liver cirrhosis (Edwards et al., 1994). Risk for cirrhosis becomes significant when average daily intake is at, or above, 80 grams of alcohol per day for men and 20 grams for women (Grant, Dufour & Harford, 1988). Numerous studies, primarily in European countries, have validated the etiologic importance of alcohol in liver cirrhosis in those countries by showing strong associations between changes in per capita alcohol consumption and rates of liver cirrhosis mortality (Corrarao et al., 1997; de Lint, 1981; Skog, 1984; Norström, 1987; Leifman & Romesljö, 1997; Skog, 1980).

ICD-9 offers discrete classifications of alcoholic and unspecific cirrhosis of the liver. However, because of problems of under-reporting in this category (similar to those associated with alcohol dependence described above), epidemiologists have generally used total cirrhosis as a more reliable indicator. Reporting of a more general indicator, chronic liver disease and cirrhosis, is more common than that of either alcoholic or total cirrhosis. More recent and complete data, permitting comparison between a larger number of countries, is available in this category. This composite category includes alcoholic and other forms of cirrhosis of the liver as well as alcoholic fatty liver, acute alcoholic hepatitis, unspecific alcoholic liver damage, chronic hepatitis, biliary cirrhosis, and other chronic liver diseases. Recent data are available from 57 countries. The danger in using this as an indicator is that cirrhosis and other liver problems not caused by alcohol use (such as cirrhosis caused by infectious disease in tropical regions and chronic liver disease association with hepatatis B and C) are included as well as the alcohol-related cirrhosis deaths.

The inclusiveness of the category must be kept in mind when reviewing the data; however, chronic liver disease and cirrhosis are the most internationally available indicators of alcohol-related disorders. Translating total deaths from chronic liver disease and cirrhosis into standardized death rates permits international comparisons. These comparisons begin to illustrate the points made above about the interaction between per capita alcohol consumption and patterns of alcohol consumption.

Table 23. SDR (per 100 000 population) for chronic liver disease and cirrhosis ICD-9 Code 571

COUNTRY	YEAR	TOTAL	MALES	FEMALES
Republic of Moldova	1996	69.2	75.6	64
Hungary	1997	46.6	75	22.9
Romania	1996	39.5	55.8	25
Mexico	1995	34.9	55.7	16.1
Turkmenistan	1993	32.1	39.1	25.9
Republic of Korea	1995	27.6	49.9	8.9
Chile	1994	23.8	36.8	12.6
Kazakhstan	1996	22.4	31.6	15.4
Slovenia	1997	21.5	31.9	12.7
Mauritius	1996	20.9	38.3	4.7
Croatia	1997	20.8	34.3	10.4
Slovakia	1995	16.8	28.6	7.1
Bahamas	1995	16.7	23.2	10.8
Austria	1997	16.1	25.5	8.1

Table 23. Continued

COUNTRY	YEAR	TOTAL	MALES	FEMALES
Portugal	1996	15.9	25.5	7.9
Bulgaria	1994	14.8	24.8	5.8
Costa Rica	1994	14.7	19.6	10
Italy	1993	14.3	20.3	9.2
Germany	1997	14.1	20.8	8.2
Venezuela	1994	12.7	20.5	5.4
Barbados	1995	12.1	22.4	4.2
Czech Republic	1997	11.5	17.6	6.1
Luxembourg	1997	11.4	16.8	6.6
France	1996	11.3	16.5	6.7
Spain	1995	11	17.3	5.5
Estonia	1997	10.8	16.1	6.6
Lithuania	1997	10	14.8	6.1
Denmark	1996	9.5	13.5	5.7
Poland	1996	9.4	14.9	4.9
Latvia	1997	8.9	13.9	5.2
Finland	1996	8.5	13.1	4.1
Belgium	1992	7.8	10.5	5.4
Trinidad and Tobago	1994	7.7	11.6	3.5
Argentina	1993	7.6	12.9	3.2
United States of America	1996	7.2	10.3	4.4
Cuba	1995	7.1	9.3	4.9
Macedonia	1997	6.6	10.6	3
Japan	1997	6.3	10	2.9
Switzerland	1994	6.1	9.1	3.5
United Kingdom	1997	6	7.7	4.3
Albania	1993	6	7.5	4.6
Colombia	1994	5.9	8.6	3.5
Canada	1995	5.6	8.2	3.3
Thailand	1994	5.3	8.1	2.8
Belize	1995	4.6	3.6	5.4
Singapore	1997	4.4	7.1	1.8
Israel	1996	4.3	6.4	2.5
Australia	1995	4.3	6.5	2.2
Malta	1997	3.8	5.8	2.1
Netherlands	1997	3.5	4.3	2.6
Sweden	1996	3.4	4.9	1.9
Kuwait	1994	3.3	3.5	2.7
Norway	1995	3.2	4.4	2.1
Greece	1997	3	4.8	1.4
New Zealand	1994	2.9	3.8	2.1
Ireland	1995	2.3	2.3	2.3
Iceland	1995	1.1	0.7	1.6

Source: WHO Global Programme on Evidence and Information for Health Policy

Acute consequences of alcohol use

Alcohol-related motor vehicle crashes are among the most serious acute consequences of alcohol use. Such crashes are a much more significant factor in overall mortality in countries that are heavily reliant on the automobile. As with other acute causes of alcohol-related mortality, they tend to kill users at younger ages than the chronic diseases associated with alcohol use, and thus cause greater years of potential life lost to death and disability as well as greater losses in productivity over the expected life-span. In the USA, for example, where motor vehicle crashes are the leading cause of death of persons under 25, nearly 70 per cent of young adult (aged 20-24 years) deaths in motor

vehicle crashes involve alcohol (Zador, 1989). An estimated 15 per cent of non-fatal motor vehicle injuries occur in crashes involving drivers who have been drinking, and in 95 per cent of these cases, the driver had a blood alcohol concentration (BAC) of more than 0.10 g% (Miller, Lestina & Spicer, 1998). In the US, fatal motor vehicle crash rates have been found to be closely affected by beer sales, less closely influenced by spirits sales, and unrelated to wine sales (Gruenewald & Ponicki, 1995), roughly reflecting patterns of drinking among young drivers.

According to the international reviews estimating aetiologic fractions attributable to alcohol use, between 37 to 43 per cent of male and 18 to 43 per cent of female deaths from motor vehicle crashes are attributable to alcohol. However, the studies on which these fractions are based are from a very narrow range of societies. In countries where driving and behaviour are generally more dangerous, the alcohol attributable fraction is likely to be lower. Recent data on motor vehicle crash deaths are available from 64 countries.[2]

Table 24. SDR (per 100 000 population) for motor vehicle crashes ICD9 Codes E810-819

COUNTRY	YEAR	TOTAL	MALES	FEMALES
Republic of Korea	1995	36.1	54.2	19.5
Latvia	1995	27.7	45.8	11.0
Venezuela	1994	24.0	38.7	9.4
Kuwait	1994	23.2	32.2	10.3
Belize	1995	20.7	39.1	2.2
Portugal	1996	19.4	31.0	8.6
Greece	1997	18.9	29.3	8.6
Colombia	1994	18.6	30.2	7.7
Costa Rica	1994	18.2	29.9	6.8
Russian Federation	1996	18.0	27.7	8.8
Lithuania	1997	17.9	27.9	8.8
Ukraine	1992	17.9	29.8	7.1
Cuba	1995	16.7	25.7	7.7
Slovenia	1996	16.6	25.9	7.4
Mexico	1995	16.2	26.4	6.8
Republic of Moldova	1995	16.0	26.3	6.5
New Zealand	1994	15.7	22.1	9.5
Poland	1996	15.5	24.7	6.7
Belarus	1993	15.5	26	5.9
United States of America	1996	15.0	20.5	9.6
Belgium	1992	14.9	22.2	7.6
Estonia	1996	14.3	22.9	6.0
Luxembourg	1997	13.7	20.4	6.7
Slovakia	1993	13.6	21.8	5.9
Mauritius	1996	13.1	21.3	5.1
Spain	1995	12.6	19.6	5.8
Kazakhstan	1996	12.5	19.1	6.2
Italy	1993	12.4	19.8	5.3
Armenia	1992	12.4	20.7	5.0
Romania	1993	12.4	19.2	5.9
Bulgaria	1994	12.3	19.2	5.5
Chile	1994	12.1	20.2	4.6
Kyrgyzstan	1996	12.0	19.0	5.4
France	1996	11.9	17.7	6.3
Austria	1997	11.7	18.0	5.5
Albania	1993	11.4	18.8	4.5
Turkmenistan	1994	11.3	17.7	5.1
Hungary	1997	10.9	17.0	5.3

[2] These data are for total, not solely alcohol-related motor vehicle crashes. There is no standard code within ICD-9 for alcohol-related motor vehicle crashes. The addition of the codes Y-90 and Y-91 to ICD-10, denoting alcohol involvement in injury, as they come into use, will facilitate such reporting.

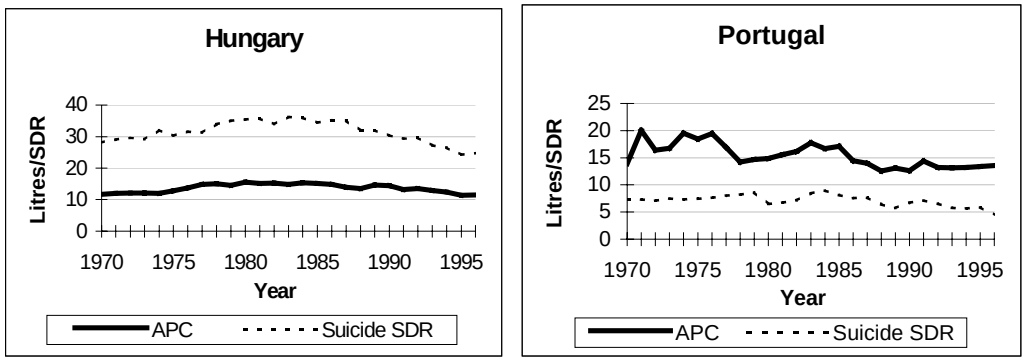
Table 24: Continued

COUNTRY	YEAR	TOTAL	MALES	FEMALES
Croatia	1996	10.7	17.0	4.6
Ireland	1995	10.7	16.3	5.1
Trinidad and Tobago	1994	10.4	15.1	5.3
Tajikistan	1992	10.3	16.3	4.5
Argentina	1993	10.1	16.1	4.5
Australia	1995	9.8	13.9	5.9
Canada	1995	9.8	13.4	6.2
Germany	1997	9.7	14.7	4.7
Uzbekistan	1993	9.3	15.1	3.9
Iceland	1995	9.1	11.6	6.7
Singapore	1997	8.8	14.4	3.3
Israel	1996	8.5	12.3	4.9
Denmark	1996	8.4	12.5	4.4
Switzerland	1994	8.1	12.1	4.2
Japan	1997	7.8	11.6	4.0
Barbados	1995	7.6	14.4	1.8
Finland	1996	6.9	10.0	3.9
Norway	1995	6.5	9.3	3.6
Former Yugoslav Republic of Macedonia	1997	6.4	9.4	3.4
Netherlands	1997	6.2	8.9	3.5
Czech Republic	1997	5.9	9.0	2.9
Bahamas	1995	5.8	8.2	3.3
United Kingdom	1997	5.7	8.6	2.8
Azerbaijan	1996	5.5	8.9	2.4
Malta	1997	5.1	9.7	0.6
Sweden	1996	4.7	6.5	2.9

Source: WHO Global Programme on Evidence and Information for Health Policy

Data on other acute causes of death are less widely available. Numerous studies in various national contexts have found a relationship between alcohol consumption and suicide (Skog, 1993; Norström, 1988; Skog & Elekes, 1993; Rossow, 1993). Drinking practices and cultural expectations of how drinkers should behave are among the factors that may influence this relationship (Edwards et al., 1994). Hospital studies have indicated that alcohol dependent people are at 60 to 120 times greater risk of suicide death than the general population (Murphy & Wetzel, 1990; Roy, 1993), while a longitudinal study of Swedish conscripts found the risk of suicide death for high consumers of alcohol to be 5.1 times that for abstainers (Andreasson, Allebeck & Römelsjö, 1988). Further evidence of a relationship comes from population-based studies that have found suicide rates closely associated to general alcohol sales (Rossow, 1993; Skog & Elekes, 1993) and spirits sales (Gruenewald, Ponicki & Mitchell, 1995). The various meta-analyses have estimated that between 16 and 41 per cent of suicides are alcohol-attributable. Rates are generally higher for men than women. Several causal hypotheses have been advanced, including: alcohol use disinhibits suicidal impulses and aggression in general (Garrison et al., 1993); heavy drinking may be indicative of larger processes of social disintegration associated with suicide (Rossow, 1993; Yang, 1992); and expectations about alcohol's behavioural effects may moderate aggressive acts such as suicide (Pihl, 1983).

Figure 5. Adult alcohol consumption and suicide in Hungary and Portugal



Source: WHO Global Programme on Evidence and Information for Health Policy

Studies in Hungary and Portugal have illustrated the close correlations between per capita alcohol consumption and suicide rates that are evident in Figure 5 above. The relationship between alcohol and suicide is not limited to developed countries: an estimated 36.4 per cent of suicides in Sao Paolo, Brazil in 1994 had BAC in excess of 80 g/ml. (Cotrim, 1997), while in Chile, between 1981 and 1983, 38.6 per cent of suicides were determined to be alcohol-related (PAHO, 1990). A 1993 study by Ethiopian researchers found a strong linear relationship between adolescent suicide attempts and alcohol intake (Kebede & Ketsela, 1993), and in Mexico in 1980, 38 per cent of suicides had BAC in excess of 100 g/ml (Terroba, Saltijeral & del Corral, 1986). Researchers have also found substantial proportions of those who commit suicide meet clinical definitions for alcohol dependence. Alcohol dependence was one of the two most prevalent chronic mental disorders among those who committed suicide in Taiwan (Cheng, 1995), while alcohol abusers in Norway were 6.9 times as likely to commit suicide as the general population (Rossow & Amundsen, 1995).

Alcohol is likely to be present during homicides and violent assaults, in both perpetrators and victims, at least in some cultures. Time-series analyses have found significant relationships between aggregate alcohol consumption and rates of violent crime over time in France, Sweden, Norway and Finland (Lenke, 1990). In 1991 in the USA, according to inmate survey data, offenders were intoxicated in 42 per cent of homicides, 36 per cent of sexual assaults, 41 per cent of assaults, and 33 per cent of robberies (Beck et al., 1993). Using inmate survey data, researchers have estimated that 18 per cent of homicides, 15 per cent of sexual assaults and abuse, 17 per cent of physical assaults and child abuse, and 14 per cent of robberies involve alcohol (CSAP, 1997; Collins & Schlenger, 1988). However, they also note that the role of illicit drug use as a co-factor could not be determined. More evidence of a relationship between alcohol use and violence comes from aggregate-level studies of effects of changes in the alcohol supply. For instance, when an industrial strike interrupted the flow of wine and spirits production in Norway, domestic disturbances fell by 22 per cent and interpersonal violence by 15 per cent (Hauge, 1988). Two US studies have found a relationship between numbers of alcohol outlets and homicide rates (Parker & Rebhun, 1995; Scribner, MacKinnon & Dwyer, 1995), while another found that higher beer taxes were associated with lower violent crime rates (Cook & Moore, 1993).

Research in developing and Central and Eastern European countries has also found a close association between alcohol use and violence. Post-mortem studies of homicides in Brazil (Cotrim, 1997), Chile (PAHO, 1990), and South Africa (Duflou, Lamont & Knobel, 1988; Lerer, 1992; Loftus & Dada, 1992) found alcohol in the blood of close to or more than half of the respective samples. Perpetrators too were likely to be drunk at the time of the crime: in Mexico in 1985, 49 per cent of those convicted of homicide had been drinking (Herman, 1987), while in the Russia Federation 71 per cent of murders in 1994 were committed in a drunken state (Egorov, 1995). Alcohol was present in the blood of 47 per cent of those admitted to the emergency room with assault trauma in Lesotho in 1988 (Van der Geldermalsen & Van der Stuyft, 1993). Researchers in Papua New Guinea found that 60 per cent of all assaults in that country in 1983 occurred under the influence of alcohol (Giesbrecht et al., 1989).

Alcohol and the global burden of disease

The data provided above on chronic liver disease and cirrhosis, motor vehicle crashes, suicide and homicide give some indication of the global health impact of alcohol. Murray and Lopez (1996) attempted to quantify this impact more comprehensively in their study of the global disease burden of various health risks, including alcohol and tobacco. They used the aetiologic fractions estimated by English et al. (1995), scaled to reflect alcohol consumption patterns in regions of the world for which data for computing aetiologic fractions are more sparse. It should be noted that data are particularly sparse for developing countries and the countries of the former Soviet Union. For developed countries, the results of the English et al. (1995) meta-analysis were directly applied. Murray and Lopez also calculated an estimate for the protective effects of alcohol for each region using the relative risk of death from ischaemic heart disease and scaled estimates of the proportion of the population which abstains from alcohol.

Based on this methodology, alcohol caused an estimated 1.1 million deaths in 1990. Alcohol's cardio-protective effect averted 470 616 deaths, with a net loss in mortality from alcohol worldwide of 773 594 deaths. The protective effect is most notable in the developed countries, which suffered 40 per cent of the alcohol-related deaths but enjoyed 62 per cent of the deaths averted. Sixty percent of the alcohol DALYs worldwide came from years of life disabled. As Murray and Lopez noted, alcohol tends to kill and disable at young ages and protect from cardiovascular diseases at older ages, a pattern which results in a high number of years of potential life lost to death and disability despite alcohol's protective effect.

Table 25. Global burden of disease and injury attributable to alcohol use in 1990

REGION [3] (WORD BANK)	DEATHS (THOUSANDS)	AS % OF TOTAL DEATHS	YEARS OF LIFE LOST (THOUSANDS)	AS % OF TOTAL OF YEARS OF LIFE LOST	YEARS OF LIFE DISABLED (THOUSANDS)	AS % OF TOTAL OF YEARS OF LIFE DISABLED	DISABILITY-ADJUSTED LIFE YEARS (DALYS) (THOUSANDS)	AS % OF TOTAL DALYS
EME	83.8	1.2	2 537	5.1	7 667	15.6	10 204	10.3
FSE	53.0	1.4	2 063	5.7	3 130	11.9	5 193	8.3
IND	112.9	1.2	2 723	1.4	1 974	2.3	4 697	1.6
CHN	114.1	1.3	2 118	1.8	2 737	3.0	4 856	2.3
OAI	97.4	1.8	1 862	1.6	3 191	5.1	5 053	2.8
SSA	170.7	2.1	4 435	2.0	3 169	4.6	7 603	2.6
LAC	136.1	4.5	3 319	5.9	6 201	14.7	9 520	9.7
MEC	5.6	0.1	229	0.2	437	1.0	666	0.4
World	773.6	1.5	19 287	2.1	28 400	6.0	47 687	3.5

Source: Murray and Lopez 1996.

Benefits and costs of alcohol

Alcohol provides some benefits both to individuals and to governments. While the less tangible benefits of conviviality, sociability and in some cases social solidarity are difficult to quantify, the global mortality estimates above are an effort to quantify alcohol's potential protective effect against cardiovascular disease. Alcohol also provides substantial revenues to governments, and particularly in some developing countries these revenues may supply a substantial portion of the national budget. In India, alcohol makes up as much as 23 per cent of some of the states' revenues (Bloomberg News,

[3] The regional (geographical) groupings used by Murray and Lopez (1996) and the World Bank are as follows:

EME	Established Market Economies	OAI	Other Asia and Islands
FSE	Former Socialist Economies	SSA	Sub-Saharan Africa
IND	India	LAC	Latin America and the Caribbean
CHN	China	MEC	Middle Eastern Crescent

Very broadly speaking EME equates with "developed countries", FSE with "countries in transition" and the rest with "developing countries".

1997). In Estonia, excise and sales taxes from alcohol account for approximately 10 per cent of the 1995 budget (Jernigan, 1997). Nepal derives between 3.2 and 3.5 per cent of its total revenue from alcohol (Saxena, 1997), while in New Zealand the figure is 1.8 per cent (Casswell, 1997).

The social costs of alcohol include the direct costs of treating injuries and diseases as well as treatment and rehabilitation costs, property losses, law enforcement costs, and losses in productivity due to absenteeism or loss of productive life years. While there are not many countries that have calculated the social costs of alcohol, there are nearly as many methodologies for counting social costs as there are estimates of them. WHO has provided more detailed discussion of social cost methodologies (WHO, in press). Where estimates have been made, costs have been substantial. Such estimates included: in Australia in 1988, US$ 3.09 billion (Collins & Lapsley, 1991); in Japan in 1987, US$ 46.2 billion (Nakamura, Tanaka & Takano, 1993); in the USA in 1995, US$ 166.5 billion (Harwood et al., 1998); in Poland in 1995, US$ 2.5 billion (State Agency for the Prevention of Alcohol-Related Problems) in Poland in 1997; in South Africa in 1995, US$ 2.7 billion (Parry & Bennetts, 1998).

Alcohol control policies

From its earliest days, WHO has placed a priority on solving alcohol related problems. A series of resolutions and publications beginning in 1975 established a policy framework for national efforts to control alcohol-related problems. Leadership in this effort has come both from WHO Headquarters in Geneva and from the WHO Regional Offices. The publication in 1975 of *Alcohol Control Policies in Public Health Perspective* (Bruun et al., 1975) was a watershed in providing a scientific basis for public policy approaches as means of influencing alcohol consumption and availability in order to reduce alcohol-related problems.

In 1979, the Thirty-Second World Health Assembly passed Resolution WHOA32.40, and urged WHO Member States to "take all appropriate measures to reduce the consumption of alcohol among all sectors of the population" and to "develop intensive preventive programmes that include public information and education concerning alcohol problems, and ensure the provision of appropriate legislation and other measures enabling effective action to be taken, for example in relation to the production and sale of alcoholic beverages." In 1983, the Thirty-Sixth World Health Assembly passed Resolution WHA36.12, and recommended that WHO Member States "(1) formulate an explicit and comprehensive national alcohol policy, with prevention as a priority, within the framework of the strategy of health for all; (2) develop mechanisms to coordinate programmes and activities for reducing alcohol consumption and alcohol-related problems on a planned, continuous and long-term basis."

Since that time, enormous experience has been gained and prodigious amounts of scientific research conducted on constructing comprehensive national alcohol policies. WHO has published a variety of summaries of that experience (see for example Rootman & Moser, 1984; Farrell, 1985; Moser, 1985; Moser, 1992), and supported or collaborated in research reviews delineating the scientific basis for various policy mechanisms. The most recent of these, *Alcohol Policy and the Public Good* (Edwards et al., 1994), reviewed in detail the state of scientific knowledge regarding the efficacy of a wide range of alcohol control policies, including taxation and other price mechanisms, controls over physical availability, policies targeting drinking in particular contexts such as drink-driving, information-based strategies, and individually-targeted interventions as a component of a public health response to alcohol. The bulk of the experience and research on these issues has been conducted in developed countries. A volume summarizing research and applications in developing nations is in preparation at the time of printing (Room et al., in press).

This section of the WHO Global Status Report on Alcohol provides a summary of the status of implementation of alcohol policies in WHO Member States. The prevention of alcohol-related problems requires a comprehensive approach, combining information and awareness programmes and treatment services with preventive policies adopted at national or local levels. WHO has, in another volume, reviewed the status of availability of resources and legislation regarding treatment (Porter, Argandõna & Curran, in press). The focus is on preventive measures, and in particular on alcohol control policies adopted in WHO Member States. The information presented is incomplete, but provides an overview of strategies tried.

Planning and implementation of alcohol policies

Few countries have designated a single central agency devoted to alcohol and alcohol problems. In most cases, responsibility for alcohol is diffused throughout national governments, including health ministries, taxation and customs authorities, food and nutrition departments, education ministries, ministries of social affairs, and ministries of justice and police. Some countries have centralized

planning for the reduction of alcohol and other drug problems in a single joint agency or a commission composed of representatives from several governmental departments. Nongovernmental organizations are also active participants or progenitors of alcohol awareness and prevention programming in many countries.

The European Alcohol Action Plan, developed by the WHO European Regional Office, has provided guidance to a number of countries in developing comprehensive national alcohol plans. Elsewhere, a few countries have developed plans specific to alcohol, particularly in cases such as France and Poland, where there is recognition at the national level that prevailing levels and patterns of alcohol use pose a significant threat to health and safety. One agency dedicated to alcohol issues, New Zealand's Alcohol Liquor Advisory Council, undertakes a variety of activities with funding from a levy on alcohol available for consumption, while Switzerland distributes proceeds from the tax on distilled spirits to cantons for prevention and treatment of alcohol and other drug problems. However, this kind of earmarked funding is rare. By far the most common approach to planning and implementation of programmes to reduce alcohol-related problems is by creating plans and agencies that deal with all psychoactive substances, including alcohol, tobacco, and illegal psychoactive drugs.

Education and health promotion

Although there is little scientific evidence of their efficacy in the absence of other control measures (Paglia & Room, 1998), many countries have implemented alcohol educational and health promotion programmes, usually in schools but also in local community and health centres. The most common targets of educational programmes are young people. In some cases these may be peer-led and designed. Mass media campaigns regarding specific problems such as drink-driving are also common. However, general health-oriented messages about drinking must compete with other persuasional messages in the environment, including ones intended to sell alcohol. Evidence of the effectiveness of these messages in influencing teenagers and young adults to drink more and problematically is increasing (Wyllie, Zhang & Casswell, 1998a; Wyllie, Zhang & Casswell, 1998b). Even where advertising of alcoholic beverages is not permitted, these messages are conveyed in a variety of other ways, undercutting efforts to send a preventive message.

Regulation of physical availability

A wide range of studies, mostly in the developed world, have demonstrated that restrictions on the production and sale of alcohol can reduce alcohol consumption and related problems (Edwards et al., 1994). There are many ways in which the physical availability of alcohol may be restricted, for instance via limitations on the number and placement of outlets, hours or days of sale, placement of alcohol products within an outlet, training managers and servers in safe service practices, and so on. For example, New Zealand has promoted server training in order to increase the likelihood that when alcohol is served, patrons will be less likely to drink to intoxication or drive away from the premises intoxicated. The most drastic of such restrictions is outright prohibition of the production and sale of alcohol. This is not uncommon in predominantly Islamic countries such as Bangladesh, Maldives and Saudi Arabia. Other countries, such as the United States, New Zealand and India, permit local or state authorities to render their jurisdictions dry. Pakistan permits alcohol consumption by non-Muslims, but forbids it for the 97 per cent of the population that is Islamic.

Table 26. Examples of countries with strong legal prohibition of alcohol production or sales

COUNTRY	PROHIBITION TYPE
Bangladesh	Complete prohibition of production, sale and consumption.
India	State option. One state has prohibition; four others recently experimented with it but have repealed it.
Maldives	Complete prohibition of production and consumption of alcohol except by tourists.
New Zealand	Partial prohibition – available by local option – five remaining dry areas as of 1990.
Pakistan	Complete prohibition for Muslims, non-Muslims need licence to drink.
Saudi Arabia	Complete prohibition of alcohol use.
United States of America	Partial prohibition – banning of sales permitted as local option in some states

Far more common than outright prohibition are partial prohibitions, mostly concerning consumption of alcohol in areas considered to be at high risk. These may include workplaces (e.g. Belarus, Belgium, Kyrgyzstan, the Netherlands) as well as areas near workplaces (e.g. Mexico). Italy bans sale of drinks containing more than 20 per cent alcohol at a wide range of public events, including sporting events, amusement parks, and open air concerts. Ecuador bans the sale of alcohol in health or educational institutions, while Egypt permits it only in hotels and tourist establishments.

Restrictions on availability to young people

Perhaps the most common form of alcohol prohibition is the setting of a legal minimum age for purchase or consumption. Several studies, most undertaken in North America, have indicated that such restrictions are effective at reducing motor vehicle crash fatalities among young people, even at relatively low levels of enforcement (Edwards et al., 1994; Wagenaar & Wolfson, 1995). At least 67 countries have some kind of minimum age legislation in place. The most common minimum age for legal purchase of alcoholic beverages is 18, although at least eight countries require drinkers to wait until age 21 years, while 15 permit drinking at age 16 years. Germany and Switzerland permit purchase of fermented beverages at age 16 years, but drinkers must be 18 years to buy distilled spirits.

Table 27. Examples of countries with laws setting minimum ages for alcohol purchase or consumption

COUNTRY	AGE	LEGISLATION
Argentina	18	Bans consumption.
Australia	18	Bans purchase and sales.
Austria	18	For consumption spirits in public in all 9 federal states; in 8 federal states limit for drinking wine and beer in public is age 16; in one, age 15.
Belarus	21	Bans purchase of alcohol.
Belgium	16	Bans purchase of alcohol.
Bhutan	18	Bans sale of alcohol.
Brazil	18	Bans consumption.
Bulgaria	18	Bans purchase of alcohol.
Canada	19	Exceptions: Age 18 in Quebec, Manitoba, Alberta.
Chile	21	Bans consumption.
Colombia	18	Bans consumption.
Cook Islands	18	Bans sale or other supply.
Croatia	18	Bans purchase.
Czech Republic	18	Bans purchase.
Denmark	18	Bans purchase in restaurants and bars.
Egypt	21	Bans consumption.
Estonia	18	Bans purchase.
Fiji	18	Bans possession or consumption in public or in licensed premises.

Table 27. Continued

COUNTRY	AGE	LEGISLATION
Finland	18	Bans purchase.
France	16	Bans purchase.
Gambia	16	Bans sales.
Greece	18	Bans purchase in public places such as bars and discos.
Honduras	21	Bans consumption.
Iceland	20	Bans purchase.
India	18	Bans sale.
Israel	18	Bans sale.
Italy	16	Bans sale.
Japan	20	Bans consumption and service in public.
Kenya	18	Bans sale.
Kyrgyzstan	18	Bans purchase.
Latvia	18	Bans purchase
Lithuania	18	Bans purchase.
Luxembourg	16	Bans purchase.
Malta	16	Bans purchase.
Mexico	18	Bans sales.
Morocco	16	Bans sales.
Mozambique	18	Bans purchase.
Netherlands	18	Bans purchase. Age 16 for buying beer or wine.
New Zealand	20	Bans purchase, sale, and supply, except in certain kinds of premises with meals in the presence of responsible relatives.
Norway	20	Bans purchase. Age 18 for buying beer or wine.
Panama	18	Bans consumption.
Peru	18	Bans consumption.
Poland	18	Bans purchase.
Republic of Moldova	18	No further information available.
Romania	18	Bans purchase.
Russian Federation	18	Bans purchase.
Samoa	21	Bans possession or consumption on licensed premises, in any other public place.
Seychelles	18	Bans purchase.
Slovakia	18	Bans purchase.
Slovenia	18	Bans consumption in restaurants and bars. No age limit for purchase in shops.
Solomon Islands	21	Bans sales or other supply.
South Africa	18	Bans sales.
Spain	16	Bans purchase. Age 18 in some regions.
Sri Lanka	18	Bans consumption.
Sweden	20	Bans purchase in state liquor stores. Age 18 for purchase in restaurants and purchase of medium strength beer sold in grocery stores.
Switzerland	18	Bans sale or purchase of distilled beverages. Age 16 for fermented beverages.
Thailand	17	Bans purchase.
The former Yugoslav Republic of Macedonia	16	Bans purchase.
Tonga	18	Bans possession or consumption on licensed premises or in other public place.
Trinidad and Tobago	16	Bans consumption.
Turkey	18	Bans purchase.
Turkmenistan	18	Bans purchase.
Ukraine	21	Bans purchase.
United Kingdom	18	Bans purchase. Possible to consume some alcoholic beverages in bars or restaurants at age 16.

Table 27. Continued

COUNTRY	AGE	LEGISLATION
United Republic of Tanzania	16	Bans presence on premises where alcohol is served.
United States of America	18-21	Bans on sale, purchase, possession and consumption vary by state.
Uruguay	18	Bans sale.

At least 18 countries have full or partial monopolies over the production of alcohol, wholesale and/or retail sale of alcohol, or some combination of these three. Amidst substantial ideological and economic pressure to privatize monopoly distribution systems, a number of studies have looked at what happens to alcohol sales when alcohol monopolies turn private. In part because the number of outlets and hours of sale typically increase, levels of alcohol consumption and problems tend to increase as well (Minghao et al., unpublished).

Monopolies and licensing systems

Some countries, such as the United States, permit local or regional authorities to decide between licensed or monopoly distribution systems. Production monopolies were the rule in the countries of the former Soviet Union. Some have kept their monopolies; others such as the Russian Federation have abolished them temporarily and then moved to re-establish them. Some countries monopolize production of some alcoholic beverages but license others. This scheme most commonly places production of beer into the hands of licensees, and most commonly keeps spirits production in the hands of the state. In Europe, national production monopolies have been the target of free market reforms, and have been abolished in Norway, Finland and Sweden. However, state-run distribution systems have proven more resistant to privatization.

Table 28. Examples of countries with alcohol monopolies

COUNTRY	TYPE OF MONOPOLY
Belarus	State monopoly on production.
Bulgaria	State monopoly on production and trade.
Canada	Provincial monopolies controlling sale of alcohol for off-premises consumption.
Finland	Retail monopoly on alcoholic beverages (except fermented products under 4.7% alcohol by volume).
France	Wholesale monopoly on brandy.
Germany	Wholesale monopoly on brandy.
Kazakhstan	No information available on type of monopoly.
Latvia	Monopoly on production of wines and spirits. Licence required for distribution.
Lithuania	Monopoly on production of wine and spirits.
Norway	Monopoly on spirits production, retail sales.
Russian Federation	Licensing system for production and distribution currently exists alongside traditional state monopoly.
Sweden	State monopoly on retail sales, except sale of medium or lower-strength beer permitted in grocery stores.
Switzerland	State monopoly on production of spirits, but not of wine, beer and cider made by fermentation. Monopoly grants licences to other producers.
The former Yugoslav Republic of Macedonia	State monopoly on production and distribution of all three types of alcoholic beverages.
Turkey	State monopoly on production and distribution of spirits.
Turkmenistan	State monopoly on production of all three types of alcoholic beverages.
Ukraine	State monopoly on production of spirits and fortified wine.
United States of America	License or monopoly a state option. 18 states have wholesale monopoly, of which 10 have retail monopoly, 3 contract out retail operations to agencies, while the remainder do not have retail monopoly.
Uruguay	State monopoly on spirits production, which may license other producers.

A more common method of restricting physical availability is through licensing, both of production and sale of alcohol. More than 40 countries operate some kind of licensing system. Coupled with such systems are often restrictions on the hours and days when alcohol may be sold. Numerous studies have found that such restrictions, if enforced, can influence alcohol consumption patterns (Edwards et al., 1994). In some countries these restrictions are well-enforced. However, laws aimed at reducing alcohol availability are notoriously subject to disobedience. In areas lacking strong central authorities, social consensus in favour of restrictions, or both, restrictions on availability may have little impact on actual production or sale of alcohol.

Table 29. Examples of countries with alcohol licensing systems

COUNTRY	TYPE OF LICENSING SYSTEM
Australia	Licence required for sale of alcohol.
Austria	Licence required for production, sale or trade.
Belarus	State production monopoly, licence required for distribution.
Bolivia	No further information available.
Cameroon	No further information available.
Canada	Provincial monopolies control sale of alcohol for off-premises consumption. Provincial licensing systems also control sale for on-premises consumption, and for off-premises sale of beer.
Cook Islands	Licence required for sale of alcohol.
Czech Republic	Licence required for production or distribution of beer, wine or spirits.
Denmark	Licence required for production and distribution of all types of alcoholic beverages.
Estonia	Licence required for production and sale of alcoholic beverages. No sale of alcoholic beverages in or close to medical and children's institutions.
Fiji	Licences required for the sale of alcohol.
Finland	Licence required for wholesale distribution of alcohol, for on-premises consumption, and for retail sale for off-premises consumption of beer and fermented beverages less than 4.7% alcohol by volume.
Gambia	Licence required for retail sale.
India	Licensing required if alcohol is legal.
Ireland	Licence required for the production and distribution of all types of alcohol (except home-made wine and beer).
Italy	Licence required for production and distribution of beer, wine and spirits.
Japan	Licence required for production of alcoholic beverages, and for off-premise but not on-premise sales.
Kazakhstan	Licence required for retail sale.
Kenya	Licences to bars to brew and sell traditional African alcoholic beverages available only in the larger cities.
Lithuania	Licence required for distribution of alcohol, production of beer.
Malawi	Licence required for sale of alcohol.
Malaysia	Licences required for production and sale of alcohol.
Malta	Licence required for distribution and production of all three types of alcoholic beverages except for home produced wine.
Mexico	Licence required for the sale of alcohol.
Nepal	Licence required for production, sale, import and export of liquor, with the exception of small amounts produced for home use.
Netherlands	Licence required for on-premises sale of all alcoholic beverages, sale of spirits for off-premises consumption.
New Zealand	Licences required for on- and off-premise sale of alcohol. 24-hour licences available.
Norway	Licence required for beer or wine production or import/export, and for on-premises consumption, and sale of beer for off-premises consumption.
Pakistan	Drinking permitted for non-Muslims with a drinking licence.
Papua New Guinea	Retail outlets licensed at the provincial level.
Poland	Licence required for production of spirits, distribution of all three types of alcoholic beverages.

Table 29. Continued

COUNTRY	TYPE OF LICENSING SYSTEM
Portugal	Licence required for production and distribution of beer, wine and spirits.
Republic of Moldova	Licence required for the sale of alcohol.
Russian Federation	Licensing system for production and distribution currently exists alongside traditional state monopoly.
Samoa	Sale of alcohol and trading hours regulated by licences granted at the community level.
Slovakia	Licence required for distribution of all three types of alcoholic beverages.
Solomon Islands	Outlets for consumption or sale licensed at the provincial level.
South Africa	Licence for on- or off-premise sales of alcohol required.
Spain	Licence required for production and distribution of beer, wine and spirits.
Sweden	Licence required for production or trade, for sale for on-premises consumption, and for sale of medium or lower-strength beer in grocery stores or for other forms of off-premises consumption.
Switzerland	Spirits monopoly grants licences to other producers.
Tonga	Trading hours set by licence.
Turkey	Licence required for production and distribution of beer and wine.
Turkmenistan	Licence required for distribution of alcohol.
Ukraine	Licence required for production of beer and table wine, and for distribution of all three types of alcoholic beverages.
United Kingdom	Licence required for production or distribution of beer, wine or spirits.
United Republic of Tanzania	Licence required for commercial sale of traditional brews.
United States of America	Licence or monopoly a state option. 32 states have licence system, while states with only a wholesale monopoly also license retail sales.
Uruguay	State monopoly for spirits production may licence other producers.
Venezuela	Number of licensed outlets limited by formula.
Zimbabwe	Licence required for retail sale of alcohol.

Taxation and other pricing regulations

Although seldom designed purely as such, alcohol taxes may be a potent tool of prevention policy. For price-sensitive young drinkers in particular, increases in alcohol taxes have been shown in some developed countries to be effective in reducing harmful consequences of drinking such as traffic casualties, cirrhosis deaths, and violence (Cook, 1981; Cook & Moore, 1993). A few countries, such as the Gambia and Sweden, are explicit in their use of tax policy to discourage alcohol consumption. Alcohol taxes are more commonly employed simply as revenue-generating mechanisms for governments, and as discussed above, may supply as much as 20 per cent of government budgets.

Taxes may be levied at producer, wholesale or retail levels. Imported beverages have often been subjected to higher duties than domestic production, but this policy is feeling the weight of the global trend toward tariff reductions. Taxes may take the form of value-added or general sales taxes, or they may be pegged to the alcohol content or the retail price of the beverage. It is not uncommon for distilled spirits to carry a higher rate of taxation than the beverages with lower alcohol content. Some countries or regions levy little or no tax on beverages produced by local production industries. This is most commonly the case with wine producing countries such as Australia, which grants wine preferential tax treatment. However, the Russian Federation, at the behest of St. Petersburg brewers, recently declared beer a non-alcoholic beverage for tax purposes (Impact International, 1997).

Taxes that are based on a flat amount per unit of alcohol rather than on a percentage of the sale price have the disadvantage of losing value with inflation, leading to a situation where the real price of alcohol may fall relative to other beverages because the effective tax rate is falling. The European Regional Office of WHO estimated that this was the case for at least one category of alcoholic beverage in 17 European countries in the first half of the 1990s (Harkin, 1995).

Effective use of taxation as a preventive policy requires that the state have a certain degree of control over the alcohol market. If substantial home or informal production or sale of alcohol exists,

as is the case in many developing countries and in some regions of the former Soviet Union and Eastern Europe, then increases in alcohol taxes taken for preventive purposes may simply transfer alcohol sales from the licit to the illicit market. Tax increases are more likely to be viewed as unsuccessful from a revenue-generating than a preventive standpoint. For instance, in February of 1995 Zimbabwe raised taxes on clear and opaque beers, and then repealed the increase in July after drinkers migrating to illegally-produced beverage, caused a significant decline in alcohol tax revenue to the fiscus (Jernigan, 1997).

Taxes are not the only strategy used to influence alcohol prices. "Happy hours" and other forms of price discounting are common in some countries. Such promotions may encourage heavy alcohol consumption during a limited time duration, and as such may contribute to the incidence of heavy drinking and its health and safety consequences.

Product labelling

Indication of alcohol content is the most common form of labelling on alcoholic beverage containers. Such labels are required in at least 40 countries. Some countries, such as Australia, also require labels to include an estimate of how many standard drinks are contained in the container. Ingredient labelling is much less common, particularly for wine and distilled spirits. However, some countries obviate the need for ingredient labelling through strict enforcement of purity laws such as Germany's requirement that beer be made only from barley, hops and water.

Warning labels on alcoholic beverage containers are required nationally in at least nine countries (Brazil, Colombia, Costa Rica, Ecuador, Honduras, Mexico, South Korea, United States, and Zimbabwe), and at the state or provincial level in two others. (In India, every state where alcohol is permitted has a label that is encouraged but not mandated by the national government, and in Canada, labels are a provincial option.) As with other informational strategies, the efficacy of such labels is difficult to measure, due to the challenge of isolating the impact of the label from other educational efforts occurring in the environment. Research on the US warning label, enacted in 1989, has found that the message is reaching the target audience of young people and heavier drinkers, and that the more exposure drinkers report to the warning, the more likely they have been to adopt harm-reduction strategies related to drinking and driving or drinking when pregnant (Greenfield, 1997). Experience from tobacco package labelling in the US suggests that regular rotation of the content of the warning label increases the label's impact (Myers et al., 1981). Such labels may be one step toward treatment of alcohol as a special commodity requiring restrictions even in a free market environment due to the dangers that unrestricted alcohol consumption may pose to public health and safety.

Regulation of promotional activities

Some kind of regulation of alcohol advertising exists in at least 37 countries, as shown in Table 30 below. Many such regulations seek to protect young people from seeing alcohol advertisements. Recent research has suggested that the evidence showing that alcohol advertising does influence the drinking habits of young people and young adults is growing stronger (Wyllie, Zhang & Casswell, 1998a; Wyllie, Zhang & Casswell, 1998b). Another recent study found a positive relationship between alcohol advertising and motor vehicle fatalities in the USA (Saffer, 1997).

Mexico, Panama and Paraguay require warning messages on alcohol advertisements. More common strategies for regulating the promotion of alcoholic beverages are the use of voluntary codes and the outright banning of advertising for certain or all alcoholic beverages in some or all media outlets. At least 29 countries have implemented bans on alcohol advertising in at least one medium. Most such bans cover all three beverage categories on at least television and radio. However, in areas such as Belarus with easy access to foreign television channels and relatively little domestic broadcast production, such bans are difficult to enforce. Elsewhere, however, for example in France, enforcement has been strict and effective, even at risk of angering the multinational brewing companies who sponsor major sporting events such as World Cup football.

An additional ten countries impose partial restrictions on alcohol advertising, most commonly banning advertising during daytime and early evening hours when young people are likely to be in the

viewing audience in substantial numbers. Some countries such as Canada prohibit specific content in alcohol advertising, including attempts to influence non-drinkers to drink, associating alcohol consumption with high-risk activities, or implying that alcohol consumption leads to social, athletic or business success. Honduras bans advertising that offends the dignity of women or that ties the use of alcoholic beverages to sports. Spain prohibits advertising of beverages containing more than 20 per cent alcohol on television and radio, and any alcohol advertising in schools, sports centres and health institutions. At least two countries permit alcohol advertising, but have attempted to run counter-advertising campaigns to balance the positive messages about alcohol with health and safety information. In 1993, Costa Rica estimated that 71 271 messages promoting beer, rum, vodka and whisky consumption appeared in the country's television, radio and print media for that year, and an attempt was made to place counter-messages in the same media in that year. When it removed its restriction on advertising of alcoholic beverage brands in 1992, New Zealand required the broadcast media to allocate US$ 771 300 per year to run moderation and other public health-oriented advertisements.

At least 14 countries rely primarily on voluntary codes of good advertising practice to regulate alcohol advertising. Although in developed countries such as Belgium, Ireland and the United Kingdom, these codes are generally observed, their effectiveness as a preventive strategy is often undercut by the vagueness of their stipulations. Elsewhere, as in Zimbabwe or in markets in transition such as the Czech Republic, voluntary codes are less likely to be well-enforced.

In addition to restrictions on advertising of alcoholic beverages, some countries have also banned other forms of promotional activity. The most common forum where such bans may be found is in the area of sport. Mauritius and Norway both ban sponsorship of sporting events by alcoholic beverage companies, while France includes such a prescription in its package of restrictions on alcohol promotion.

Table 30. Examples of countries with restrictions on alcohol advertising

COUNTRY	RESTRICTION
Belarus	Broadcast advertising of all three types of alcoholic beverages restricted, but visible on foreign channels.
Brazil	Broadcast advertising of beverages in excess of 13 per cent alcohol by volume banned between 06:00 - 21:00 hours
Bulgaria	Broadcast, newspaper/magazine, cinema advertising banned.
Canada	Content restrictions.
Cook Islands	Banned on television.
Croatia	Banned on television, radio, in magazines/newspapers, on billboards.
Denmark	Banned on radio, television.
Ecuador	Permitted on television between 20:30 - 04:00 hours; in cinema after 19:00 hours
Egypt	All forms banned.
Estonia	Banned on radio, television, but beer advertises on television.
Finland	Advertising of beverages with 22 or more per cent alcohol by volume banned.
France	Banned on television, in cinemas; restricted to adult press in newspapers, magazines. Health warning required.
Honduras	Content restrictions.
Iceland	Banned on television, radio, billboards; in newspapers/magazines, cinemas.
India	Banned in print or electronic media or on billboards. Permitted at sporting events, also visible on channels from neighbouring countries.
Lithuania	Spirits and wine advertising banned in media.
Malaysia	Banned on broadcast media, on billboards except in east Malaysian state of Sabah.
Mexico	Warning label required on advertisements.
Netherlands Antilles	Permitted on television only between 22:00 - 01:00 hours.
New Zealand	Alcohol brand advertising permitted on television between 21:00 hours – 0600 hours. Content restrictions.

Table 30. Continued

COUNTRY	RESTRICTION
Norway	Banned in all media.
Panama	Content restrictions. Warnings required on advertisements.
Papua New Guinea	Banned in newspapers and other print media. Restricted to licensed premises, officially sanctioned sponsorships of sporting events and teams.
Poland	Banned.
Portugal	Permitted between 21:30 – 07:00 hours on broadcast media. Not permitted on billboards, in cinemas, in schools. Content restrictions.
Russian Federation	Banned.
Slovenia	Banned on television, radio, billboards; in newspapers/magazines, cinemas.
South Africa	Content restrictions.
Spain	Advertising of beverages with alcohol content greater than 20% banned on television radio. Advertising of weaker beverages permitted only after 21:30 hours.
Sweden	Banned except for advertising of light beer; permitted in trade magazines.
Switzerland	Advertising beer on television, radio, and billboards banned except billboards in certain villages. Wine and spirits advertising banned on television. Spirits advertising restricted in magazines/newspapers, cinemas, on billboards.
Thailand	Banned on television.
Turkey	Banned on national broadcasting. Beer advertisements permitted on private broadcasting, (as well as wine) prohibited on billboards.
Ukraine	Banned on television, radio, in press aimed at young people.
United Kingdom	Banned on television between 16:00-18:00 hours, except on bank holidays and weekends; between religious programmes; before, during or after children's programmes.
United States of America	Content restrictions.
Venezuela	Banned on television and radio.

Deterrent policies

Even more prevalent than restrictions on alcohol availability, price or promotion in the past two decades have been a variety of policies designed to deter drinkers from harming others after drinking. The most common behavioural target of such measures has been drink-driving. Policy tools have included mandatory graduated sentencing laws, mandating combinations of treatment, incarceration and forfeit of property and privileges that escalate based on the number of convictions for driving while intoxicated; and the setting of *per se* limits defining drunkenness by the amount of alcohol present in the bloodstream (BAC), and permitting sanctions to be applied upon determination of drunkenness through breath or blood-testing. Sanctions based on such a standard prove easier to uphold in the face of legal challenges than earlier attempts to establish drunkenness based on behavioural testing or outward physical signs.

Research has determined that sanctions that are swift and certain have the most likelihood of influencing behaviour (Ross, 1982). This is particularly important in the case of actions like drunk driving, where the ratio of infractions to apprehensions may be very high, causing complacency among drinkers. In this light, some countries have granted authorities permission to administer breath tests randomly by the side of the road, and to issue sanctions such as removal of permission to drive administratively on the spot. Research in the US has found this to be an effective strategy (Johnson & Walz, 1994).

Table 31. Countries with blood alcohol concentration (BAC) limits for drivers

COUNTRY	BAC LIMIT (G%)	COMMENTS ON LIMITS
Australia	0.05	0.0 g% for drivers of heavy, dangerous goods, public transport vehicles; learners and drivers under 25 years of age for first three years of driving.
Austria	0.08	-
Azerbaijan	0.0	-
Belarus	0.04	-
Belgium	0.04	-
Brazil	0.08	-
Bulgaria	0.05	-
Canada	0.08	In most provinces there is at least temporary loss of licence at 0.05 g%.
Croatia	0.05	0.0 g% for professional drivers.
Czech Republic	0.0	-
Denmark	0.08	-
Estonia	0.05	-
Fiji	0.08	-
Finland	0.05	-
France	0.07	Over 0.07 g% considered a contravention, receives a fine. Over 0.08 g% considered an offence.
Georgia	0.0	-
Germany	0.08	-
Greece	0.08	-
Hungary	0.0	-
Iceland	0.05	-
India	0.10	-
Ireland	0.08	-
Israel	0.05	-
Italy	0.08	-
Kyrgyzstan	0.0	-
Lithuania	0.04	-
Luxembourg	0.08	-
Malaysia	0.08	-
Mauritius	0.08	-
Netherlands	0.05	-
New Zealand	0.08	0.03 g% for those under 20 years of age.
Norway	0.05	-
Palau	0.10	-
Peru	0.06	Between 0.06 g% and 0.10 g% receives a misdemeanour; 0.10 g% and above receives a much higher fine.
Poland	0.03	-
Portugal	0.05	-
Republic of Moldova	0.03	-
Romania	0.0	-
Russian Federation	0.10	-
Singapore	0.08	-
Slovakia	0.0	-
Slovenia	0.05	0.0 g% for professional drivers.
South Africa	0.05	-
Spain	0.08	0.05 g% for drivers of vehicles more than 3500 kg; 0.03 g% for public service drivers, drivers of dangerous merchandise, emergency services, schoolchildren, minors, special services.
Swaziland	0.15	-

Table 31. Continued

COUNTRY	BAC LIMIT (G%)	COMMENTS ON LIMITS
Sweden	0.02	-
Switzerland	0.08	-
The Former Yugoslav Republic of Macedonia	0.05	0.0 g% for professional drivers.
Turkey	0.05	-
Turkmenistan	0.03	-
Ukraine	0.0	-
United Kingdom	0.08	-
United States of America	0.08-0.10	State option: 17 states have 0.08 g% ; 33 have 0.10 g%.
Zimbabwe	0.08	-

At least 54 countries have established permissible levels for blood alcohol when driving (Table 29). Although eight countries (mostly located in Central and Eastern Europe) have dictated that no amount of alcohol is permissible in the blood when driving, the most common upper limit is either 0.05 g% (14 countries) or 0.08 g% (18 countries). Some countries have permitted local or regional authorities to set limits. For instance, in the United States 17 states have adopted a standard of 0.08 g% while the remainder adhere to a limit of 0.10 g%. Some American states have lowered permissible BACs for younger drivers to between 0.0 g% and 0.05 g% in an effort to reduce the involvement of young drivers in alcohol-related motor vehicle crashes. Elsewhere, as in Spain, different limits are set depending on the type of vehicle driven. Spanish public service drivers are permitted no more than 0.03 g%, drivers of vehicles weighing more than 3500 kg must remain below 0.05 g%, while the general public may range up to 0.08 g%.

The effectiveness of such measures depends heavily on the level of enforcement. In developed countries, where breathalyser technology is readily available and affordable, equipping teams of police to do routine or random roadside testing increases the preventive power of the law. In developing countries, however, the gap between legislation and implementation may be greater. Zimbabwe set a legal limit for BAC at 0.08 g%, but as of January 1995, each of Zimbabwe's eight provinces had only one, non-portable breathalyzer (Jernigan, 1997).

Treatment strategies

Treatment of alcohol-related problems, including dependence, is a strategy typically targeted to the individual and not to the large population. In many countries, a wide variety of treatments exist, voluntary and compulsory, ranging from hospital-based clinics, psychiatric hospitals, outpatient treatment, integrated in primary health care, community-based approaches, self-help groups, and traditional healers, among many others. Some developed countries have organized treatment systems for alcohol problems, which are integrated and can cover a broad range of problems. Very few countries have systematically evaluated various forms of treatment and the resources allocated for treatment are often very scarce, if existent. It can be said that globally, access to affordable and effective treatment is still largely inadequate in the majority of countries.

Brief interventions have proven to be cost-effective for those with early problems related to alcohol. It is possible that these interventions, if widely disseminated in a variety of clinical and community settings, would have an impact on the aggregate levels of problems in a given society as well, but this remains an open question for future research.

Conclusion

Alcohol consumption is declining in most of the developed countries, and rising in many of the developing countries and the countries of Central and Eastern Europe. Males do most of the drinking in these countries, and evidence available regarding patterns of drinking suggests that large amounts of heavy drinking are occurring. Alcohol's contribution to the global burden of disease is significant and growing in some regions, to the point that in parts of Central and Eastern Europe, alcohol use is contributing to an unprecedented decline in male life expectancy. While there is much that remains to be learned about alcohol use and problems around the world, the evidence displayed in these pages is sufficient to suggest that alcohol is a significant threat to world health.

On the supply side, while production of various forms of alcohol for domestic consumption is widespread, production for export is concentrated in few of the mostly developed countries, and in the case of beer and distilled spirits, in the hands of a shrinking number of large global corporations. These corporations spend heavily on marketing designed to stimulate demand for alcoholic beverages. They employ sophisticated technologies to integrate their products into new markets. In many of these new markets, alcohol is recognized for its revenue-generating potential, but the substantial costs of alcohol-related problems are uncounted. The most commonly used alcohol policies seek to limit alcohol-related harm, but public health-oriented technologies to reduce demand are far more prevalent in developed than developing countries, and are in danger of being swept aside by free market reforms.

In keeping with resolutions passed by the World Health Assembly, WHO encourages its Member States to improve their monitoring of alcohol consumption and problems. A forthcoming publication from WHO/SAB will recommend standardized methodologies to improve data collection and comparability (WHO, in press). Adoption of such methodologies, along with increased monitoring of alcohol use and problems at the national level, will increase the accuracy and comprehensiveness of future editions of the Global Status Report.

WHO Member States also need to adopt comprehensive national programmes to prevent alcohol-related problems. Approaches to alcohol must be consistent with local cultures and mores. Each country must develop its own unique mix of strategies. There is substantial evidence that the serious harms from alcohol use experienced by millions of people, drinkers and non-drinkers, across the globe are not inevitable. As the country profiles in this document demonstrate, numerous strategies are being used to prevent and contain alcohol-related problems. These technologies exist, and in many cases their efficacy has been scientifically demonstrated. Increased attention to alcohol and a commitment to implementing comprehensive programmes of education, treatment and regulation will help to reduce and avert an epidemic of alcohol-related disability, disease and death worldwide.