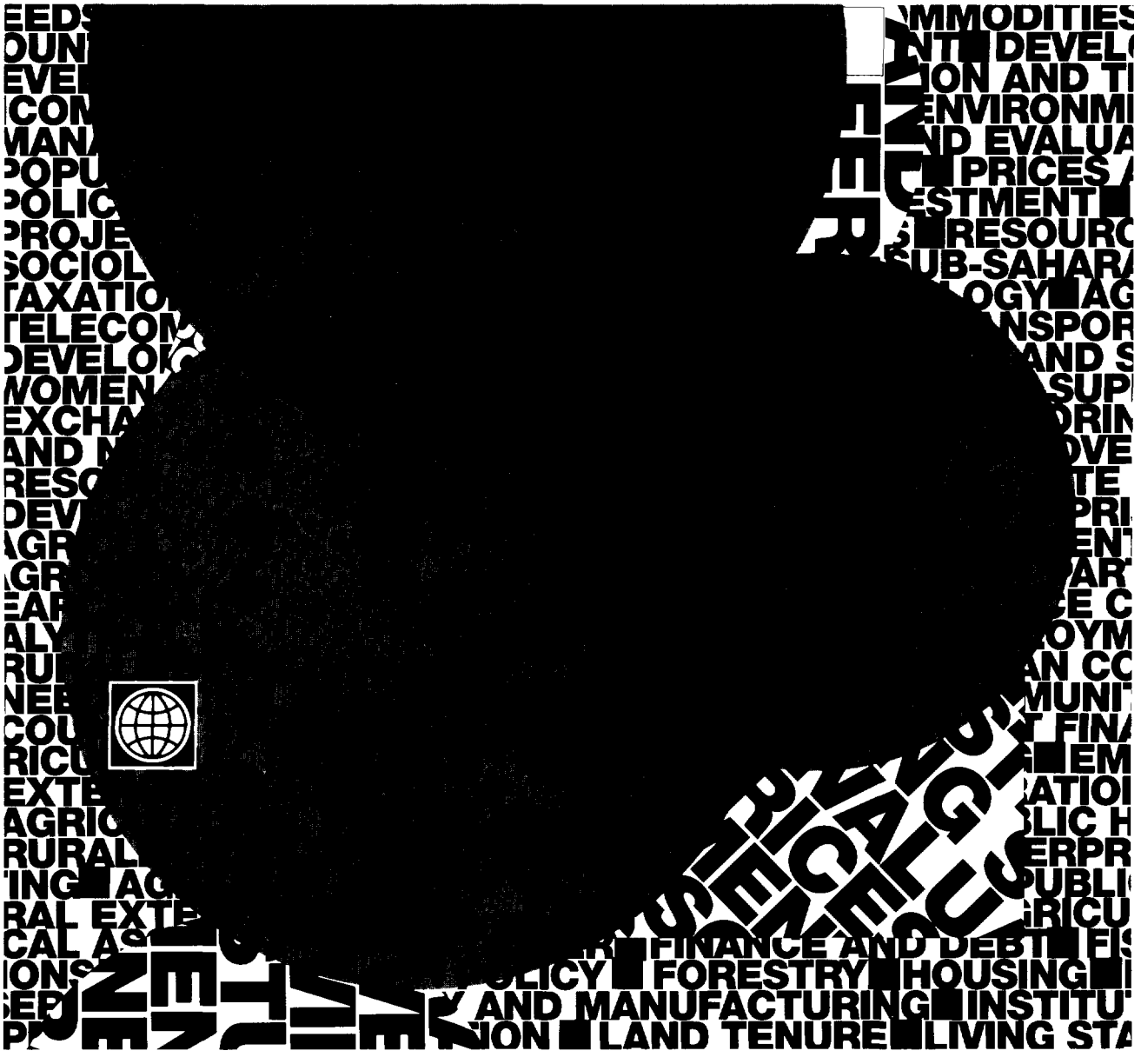
WORLD BANK TECHNICAL PAPER NUMBER 219

Alcohol-Related Problems as an Obstacle to the Development of Human Capital

Issues and Policy Options

James A. Cercone



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The World Bank
Washington, D.C.

Manufactured in the United States of America
First printing January 1994

The complete backlist of publications from the World Bank is shown in the annual *Index of Publications*, which contains an alphabetical title list (with full ordering information) and indexes of subjects, authors, and countries and regions. The latest edition is available free of charge from the Distribution Unit, Office of the Publisher, The World Bank, 1818 H Street, N.W., Washington, D.C. 20433, U.S.A., or from Publications, The World Bank, 66, avenue d'Iéna, 75116 Paris, France.

ISSN: 0253-7494

James A. Cercone is a health economist who was working as a consultant to the Population, Health and Nutrition Department of the World Bank when this report was written.

Library of Congress Cataloging-in-Publication Data

Cercone, James A., 1968–
Alcohol-related problems as an obstacle to the development of human capital : issues and policy options / James A. Cercone.
p. cm. — (World Bank technical paper ; no. 219)
Includes bibliographical references.
ISBN 0-8213-2516-7
1. Alcoholism. 2. Alcoholism—Economic aspects. I. Title. II. Series.
HV5035.C43 1993
362.29'2—dc20 93-6168
CIP

Contents

ACKNOWLEDGEMENTS

This study was originally conceived by Ann Hamilton and Anthony Measham, who provided advice and encouragement throughout its course. Although the author assumes full responsibility for the contents, the paper has benefitted greatly from the comments of Howard Barnum, Jose-Luis Bobadilla, and Jeffrey Hammer. The author would also like to thank Marta Ospina for providing editorial assistance.

FOREWORD

In recent years, policy makers in the public health arena have begun to discuss factors influencing health that lie outside of the traditional health care model. Increasing evidence points to the deleterious health effects of inadequate education, poor nutrition, excess fertility, and behavioral factors such as substance abuse. Of these determinants, tobacco and alcohol consumption account for nearly 5 million deaths annually worldwide. As levels of GNP per capita rise, third world populations age, and noxious substances are more widely marketed and distributed in developing countries, the number of deaths can only be expected to increase.

As part of a broader work program on addictive substances, the purpose of this study was to review the range and the impact of alcohol-related problems and to initiate the debate on the appropriate role of government in reducing the morbidity and mortality attributable to the use of addictive substances. While the net impact of these problems is unknown, many countries have acknowledged the significant health, social, and economic costs they impose. Using evidence from developed and developing countries, the study discusses the nature of alcohol-related problems, reviews trends in production, consumption, and alcohol-related mortality, as well as discussing the costs of alcohol-related problems. The study concludes by examining several policy options and the relative effectiveness of different interventions on alcohol-related mortality.

At a time when many countries are placing emphasis on the development of human capital, alcohol-related problems are an obstacle to development. The paper shows that government policies which lower overall consumption, such as bans on advertising, drinking age laws, and increased alcohol taxes can have a significant impact on the number of alcohol-related deaths. By incorporating some of these policies into the portfolio of interventions available to policy makers in the health sector, developing countries can reduce the social and economic burden of alcohol-related problems.

Janet de Merode
Director
Population, Health, and Nutrition Department

ABSTRACT

In the last decade, the problems related to excessive alcohol consumption have increased dramatically in many societies, both developed and developing. Worldwide, alcohol accounted for 2 million deaths in 1989. As levels of GNP per capita rise, third world populations age, and alcoholic beverages are more widely marketed and distributed in developing countries, levels of alcohol consumption can only be expected to increase. The impact of an increase in alcohol consumption extends beyond increasing levels of premature mortality, to include a myriad of secondary problems, ranging from child abuse to reduced worker productivity. Although the net impact of these problems is unknown, many countries have acknowledged the significant health, social, and economic costs they impose. This paper is an initial attempt to review the impact of these alcohol-related problems and to promote the debate on the appropriate role of government in regulating alcohol consumption.

In designing policies to maximize social welfare it is clear that alcohol consumption and the related problems of premature mortality, morbidity, and the range of secondary effects need to be addressed. These problems are particularly salient, given that people in the age group 15-24 and members of the lower income groups are the most likely to experience problems related to intoxication. Because consumers of alcohol are typically ill-informed of the impact of their consumption and, moreover, that alcohol-related problems impose significant costs on society, government intervention is justified. The reliance on supply restrictions as an effective remedy to the myriad alcohol-related problems has eroded to give way to policy instruments which target the demand for alcohol; these range from the more obvious, information campaigns, to raising prices and imposing bans on advertising. Although the impact of information campaigns on alcohol consumption has not been quantified, there is evidence that countries with bans on advertising have lower levels of consumption and about 10 percent fewer deaths due to a decline in the number of motor vehicle accidents. Moreover, empirical evidence shows that raising liquor prices can significantly reduce ethanol consumption and subsequently lower alcohol-related mortality. Liquor taxation, therefore, can justifiably be viewed as an effective policy instrument in the public health area.

At a time when most countries are trying to foster the development of human capital through investments in education and health, alcohol-related problems impose an increasingly heavy burden. And while the causality between alcohol consumption and alcohol-related problems is less than clear, the number of problems and deaths attributable to alcohol consumption will surely rise if governments do not begin to implement balanced, preventive policies to mitigate the impact of these problems. Until now, low levels of income and minimal access to beverage markets precluded developing countries from developing high levels of alcohol consumption. As these trends are reversed, the economic and social costs associated with increasing levels of consumption may be inimical to national economic development.

I. Introduction

The excessive consumption of alcohol is a problem that alarms many policy makers in the public health arena. In the last decade, the problems related to alcohol abuse increased dramatically in many societies, both developed and developing. In many countries, one in ten individuals are clinically diagnosed as alcoholic at some point during their lives. This growth in alcohol-related problems is manifest in an increasing number of alcohol-related deaths, diseases such as cancer of the liver, and lost productivity due to alcohol dependence. While the impact on morbidity and hence productivity is difficult to measure, according to WHO mortality data, alcohol-related diseases accounted for 2 million deaths worldwide in 1989. The impact of alcohol abuse, however, extends beyond premature mortality, to include a myriad of secondary problems, ranging from child abuse to reduced worker productivity. Although the net impact of these problems is unknown, many countries have acknowledged the significant health, social, and economic costs they impose on developed and developing countries. As levels of GNP per capita rise, third world populations age, and alcoholic beverages are more widely marketed and distributed in developing countries, the number of alcohol-related problems can only be expected to increase.

In spite of the apparently negative impact of alcohol on society, alcohol has been an important element in many cultures. From anesthesia in the civil war to fuel in many parts of the world, the production and consumption of alcohol has been an integral part of social, religious and medical life in societies all over the world. In fact, it is only recently, that the benefits of moderate alcohol consumption have been held in contrast with evidence of the deleterious effects of over-consumption. In response to a growing number of alcohol-related problems, many countries are now examining domestic policies related to alcohol consumption.

Over time, developed countries have experimented with a range of policy options, from prohibition to bans on advertising, drinking age laws and health promotion campaigns. While these policies have been effective in developed countries, resulting in stable or declining per capita consumption, they have also stimulated beverage companies to pursue new markets in less developed countries. As a result, alcohol problems have risen rapidly in developing countries.

The increasing number of health and social problems related to excess alcohol consumption, such as traffic accidents, spousal and child abuse, and diminished worker productivity impose an increasingly heavy burden on the developing countries. At a time when many countries are placing emphasis on the development of human capital, alcohol-related problems may be an obstacle to continued development. Furthermore, the economic costs associated with excessive alcohol consumption may be inimical to overall goals of national economic development.

This paper is an initial attempt to review the range and impact of alcohol-related problems and to promote the debate on the appropriate role of government in regulating alcohol consumption. Given that alcohol related problems are well documented in developed countries, this paper will draw on lessons learned in the industrialized countries and present only a cursory view of the problems in developing countries. Section II provides a review of the problems related to the consumption of alcoholic beverages. Section III will examine global trends in alcohol production and consumption. Section IV then follows with a discussion of trends in alcohol-related mortality and morbidity. Section V of the paper examines the various means of analyzing, within an economic framework, the cost of alcohol-related problems. Section VI provides a brief discussion of the cost-effectiveness of different interventions and then discusses the role of government in the prevention and control of alcohol related problems vis a vis the various policy options. And Section VII concludes with some final remarks and a call for additional research.

II. The Nature of Alcohol-Related Problems

The range and the severity of alcohol-related problems vary considerably from country to country as well as within countries. Perceptions of traditionally acceptable patterns of consumption which guide total alcohol consumption decisions, also vary from culture to culture; as a consequence, drinking patterns range from intermittent intoxication (e.g. weekends) to habitual, casual drinking. The variance in drinking patterns among countries makes it difficult to document the problems and conditions in which alcohol is a factor. In addition, physiological differences coupled with the range of drinking patterns make it difficult to gauge the subtle issue of how much alcohol, per se, contributes to observed alcohol-related problems.

How do we measure alcohol consumption?

Nobody knows exactly how much alcohol people drink. Although official statistics capture a portion of the consumption, in less developed countries a big share of intake is illicit home-brew which defies precise statistics. Estimates of black market production, importation, and sales for Latin America indicate that these consumption figures may underestimate true consumption by as much as one third[1]. Before entering into a discussion on the problems related to excessive alcohol consumption, it is useful to discuss how the consumption of alcohol is generally measured.

Ideally, consumption per capita would be measured through survey-based estimates, controlling for various socioeconomic characteristics which have been shown to influence alcohol consumption. Unfortunately, due to the dearth of information on *actual* consumption, these types of estimates are not generally available. In absence of true consumption data, the most commonly used proxy is an arithmetic mean of per capita consumption. Traditionally, finding the arithmetic mean would entail summing-up the alcohol consumption of a group of individuals and then dividing by the number of individuals in the group. Estimates of consumption in most countries, however, are generally based on information on the production, import and export, and sale of alcoholic beverages rather than alcohol demand studies. Thus, the figures used to describe consumption and overconsumption really measure the availability of beverages *legally* on the market, rather than the absolute level of consumption. Despite these methodological problems, per capita consumption is widely accepted as a measure of alcohol consumption.

Once an average measure of consumption is decided upon, the next step is to gather evidence of heavy drinking. Although precise figures are not readily available, data on alcohol use/abuse are available from various small sample surveys. The distribution of alcohol consumption for sample populations in the United States, Costa Rica, and Mexico, age 18 to 65 years, is displayed in Table 1. Interestingly, the distribution of consumption in the three countries is similar. In the United States 33 percent of the population are classified as "abstainers" and 9 percent are "heavy drinkers," while in Costa Rica 34 percent abstain and 10 percent are "heavy drinkers"; in Mexico 46 percent are "abstainers" and only 7 percent are classified as "heavy drinkers." In analyzing the distribution of alcohol consumption it is particularly important to examine the gender differences. In Mexico, for example, although only 7 percent of the population is classified as heavy drinkers, this is an average which reflects a 14 percent rate for the male population and only a 0.6 percent rate for the female population.

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[1] Personal communication from Dr. Leonardo Mata, INISA, San Jose, Costa Rica, May 1992.

TABLE 1
Distribution of Alcohol Consumption

Amount Alcohol in ounces	Drinking Category	United States (%)	Costa Rica (%)	Mexico (%)
0	"Abstainers"	33	34	46
0.01-0.21	"Light drinkers"-up to 3 drinks weekly	34	16	25
0.22-0.99	"Moderate drinkers"-up to 2 drinks daily	24	26	21
1+	"Heavy drinkers"-from 2-10 drinks daily	9	10	7

Source: US--Johnson et.al (1977); Costa Rica--Miquéz (1983); Mexico--Encuesta Nacional de Adicciones (1990).

In absence of survey data which reveal distributional drinking patterns and the incidence of cirrhosis of the liver, another commonly used proxy for excessive alcohol consumption is the mortality rate due to cirrhosis of the liver (Hyman, 1981). Although there is a lag between consumption and the emergence of the disease, cirrhosis mortality is a good indicator because the protracted consumption of alcohol in substantial quantities is toxic to the liver. If consumption is sustained at a toxic rate, over time the cells of the liver degenerate and this protracted degeneration produces fibrosis in the liver. If the degeneration continues, death will likely result. Of course, not all cirrhosis mortality is the result of over-consumption of alcohol. While estimates of nonalcoholic cirrhosis fatalities range from 4 to 50 percent, the literature indicates that 50 percent of all cases of cirrhosis are related to alcohol (Hyman, MM, 1981). In addition, it is important to note that only 10 to 25 percent of clinical alcoholics have well-established cirrhosis of the liver, apparently due to the long lag between the onset of heavy drinking and the manifestation of cirrhosis in the liver.

Another measure of excessive consumption, which is generally available in national mortality statistics, is the number of deaths attributable to alcohol dependence syndrome. Alcohol dependence syndrome is a clinical classification of alcoholism adopted by the International Classification of Diseases (ICD-10). Given that nearly 100 percent of the deaths under this classification can be directly attributable to a history of excessive alcohol consumption, this may, in fact, be a better proxy for excessive consumption than any of the other proposed indices. By analyzing mortality rates for either cirrhosis of the liver or alcohol dependence syndrome concurrently with per capita levels of absolute alcohol consumption, a general picture of the range and severity of alcohol-related problems in a country can be ascertained.

The influence of alcohol substance abuse on morbidity and the subsequent link to declines in productivity are other important aspects in analyzing alcohol-related problems. Special studies designed to measure the percentage of hospitalizations or emergency room cases which are alcohol related are generally the most effective measure; though detailed studies of the discharge diagnoses of patients admitted for alcohol-related problems provide a much more precise figure of the prevalence of alcohol

abuse in the population. Evidence from several studies based on hospital roster-admissions of morbidity in developing countries will be presented later in this section.

Alcohol-Related Problems

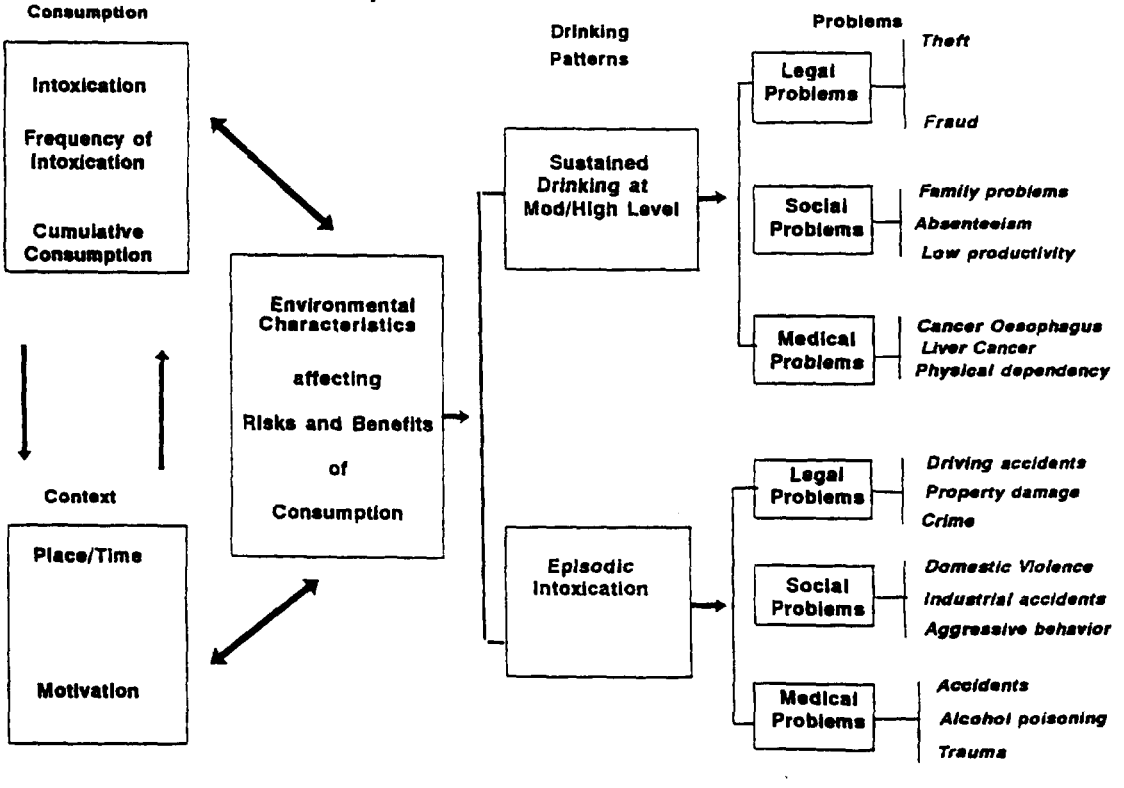
Because of the many complexities highlighted in the preceding section, an extensive accounting of the effects of drinking is well beyond the scope of this paper. Instead, this section attempts to array many of the problems related to excessive alcohol consumption in order to promote the design of relevant policy.

For analytical purposes, alcohol-related problems may be disaggregated into two sub-groups. The first group consists of primary, or internal, effects which directly affect the health of the individual and impose economic costs of lost income or productivity resulting from premature death and illness due to alcohol-related disease and trauma. The second group, which is more difficult to quantify, is characterized by problems with secondary, or external, effects on the individual and on society. The secondary effects include a wide range of social and familial problems, with implications on both the family's physical and financial welfare. To simplify the effects of alcohol consumption, the primary and secondary effects can be broken down into problems related to continuous consumption and those related to intoxication.

The classification proposed by a 1985 World Health Organization study on alcohol divided alcohol-related problems into two groups: (i) those which may be caused by extended periods of over-consumption and (ii) those which may be caused by periodic intoxication. A general description of the principal causal relationships between alcohol consumption and alcohol-related problems is described in Figure 1.

Figure 1

Diagram of Relationship between Alcohol Consumption and Alcohol-Related Problems



One aspect not captured by this dichotomization, is the lack of information on the risks associated with the excessive consumption of alcohol; this, in turn, leads to distortions in behavior and increases in consumption which would not occur under perfect information. In many regions, the problems associated with alcohol consumption are more a function of the lack of knowledge of alcohol problems and the lack of a regulatory environment (excise taxes and controls on advertising) than a function of the absolute amount of alcohol consumed. In Africa, for example, the consumption of beer and spirits has only recently become popular due to the rapidly expanding markets. As a result, many groups who previously did not drink alcohol, such as young adults and children, are now increasingly beginning to drink. At the same time, there is a misunderstanding in society toward the consumption of alcohol. In Lesotho, for example, a study of 1133 high school students aged 11-22 found that 50 percent of the students believed moderate drinking was impossible and that the fun of drinking was to get drunk. Anecdotal observations by researchers in Lesotho also suggest that these drinking patterns among the young stems from aggressive advertising directed to adolescents (Meursing and Morojele, 1989).

In general, the number of problems is proportional to the per capita consumption of alcohol in the country. If one accepts the assumption that alcohol-related problems are correlated with the per capita level of consumption within a country, the logical conclusion is that reductions in consumption should result in a decline in alcohol-related problems over time. To frame these relationships, the next two sections will examine global trends in alcohol consumption, followed by a discussion of trends in alcohol related problems.

III. Trends in Production and Consumption

Consumption of alcohol

The basic assumption of the literature on alcohol abuse and the related problems is that trends in alcohol-related problems are positively correlated with alcohol consumption. To that extent, data on country-specific consumption of beer, wine, and spirits can be used as the starting point for an analysis of the impact of alcohol-related problems. While data on beer, wine and spirits consumption are not available in every country, the Brewers' Society has compiled data on global alcohol consumption as measured in liters of absolute alcohol per person. The average liters per capita for these countries from 1970 to 1989 are shown in Figure 2. In 1989, levels of consumption across countries range from a low of 1.2 liters per capita in the Republic of Korea (beer and wine) to a high of 13.9 liters per capita in Germany. (This data is also contained in Annex table A-1)

On average, worldwide alcohol consumption per capita has been relatively constant over the last 20 years. Although consumption has increased in countries such as Germany and Japan, it has declined in France, Chile, Venezuela, Peru, and many others. Given that increases in income tend to lead to even greater increases in the consumption of alcohol (the income elasticity ranges from 1.3 for beer to 2.5 for spirits) (Clements and Selvanathan 1991), it is likely that rising per capita income accounts for most of these increases, while falling incomes contribute to declines in consumption. It is interesting to note, however, that consumption increased in several of the countries of Latin America, despite falling incomes due to the economic crisis of the 1980's. Unfortunately, it is difficult to measure whether this was caused by increased production or a decrease in the relative price of alcohol--among other things. These increases are shown in figure 2 and Annex table A-1, demonstrating that significant increases in consumption occurred between 1970 and 1989 in Colombia, 72 percent, and Brazil at 242 percent, eventhough Latin America experienced a severe economic crisis in the 1980s.

The data for total alcohol consumption obscure interesting trends among the individual beverages. Between 1970 and 1989 per capita consumption of beer increased by 61 percent worldwide (85 percent in Asia), while per capita consumption of wine fell by 16 percent and the consumption of spirits increased by 29 percent. The general trends for beer and wine consumption per capita are shown in figures 3 and 4 while Annex tables A-2 and A-3 contain consumption data for beer and wine. As discussed earlier in the section on the mortality from alcohol-related diseases, the fall in alcohol consumption is an important trend in countries such as France and Italy, which traditionally had very high levels of consumption (and fairly elevated age-standardized rates of cirrhosis).

Over the past twenty years, the consumption of spirits has increased substantially (See Annex table A-4). Unfortunately, there is little data on non-commercial spirits consumption. It may be, therefore, that production and consumption has increased even more rapidly for non-commercial beverages. Future increases in consumption will likely depend on expanding global markets for alcoholic beverages and increasing real incomes. The fact that spirits have the highest income elasticity (elasticities as high as 2.5 have been measured by Clements and Selvanathan) indicates that large increases in per capita consumption of spirits are unlikely without a significant rise in income per capita.

Figure 2

Alcohol Consumption Per Capita
By Country, highest to lowest

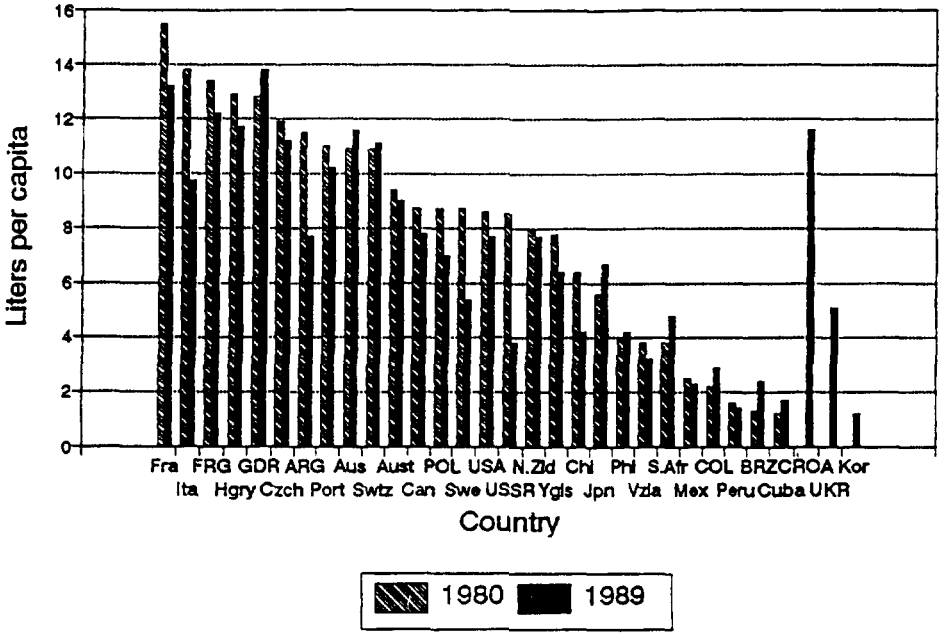


Figure 3

Beer Consumption Per Capita
By Country, highest to lowest

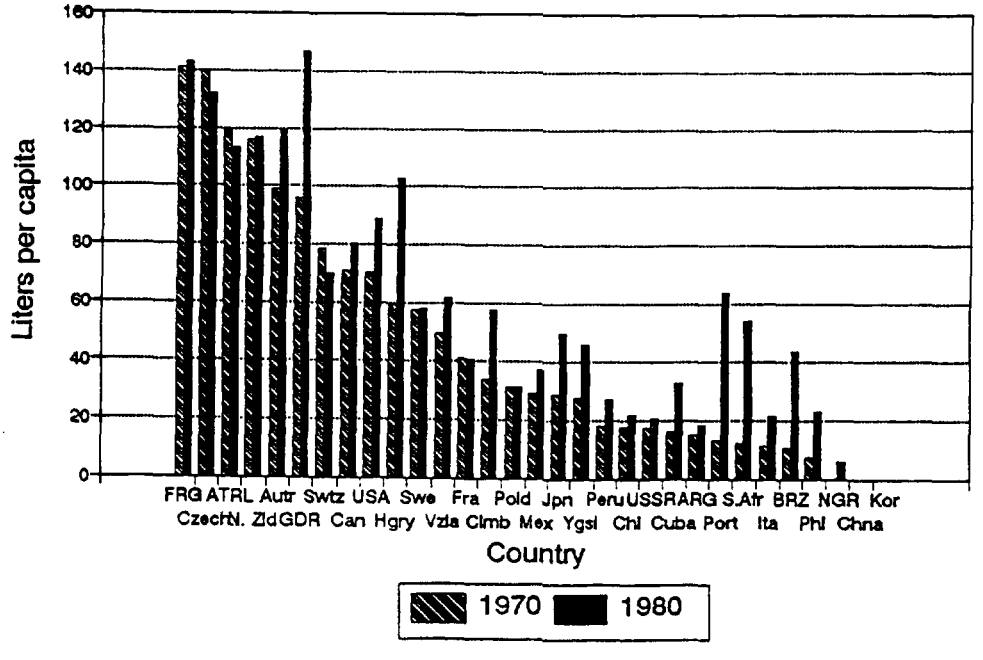
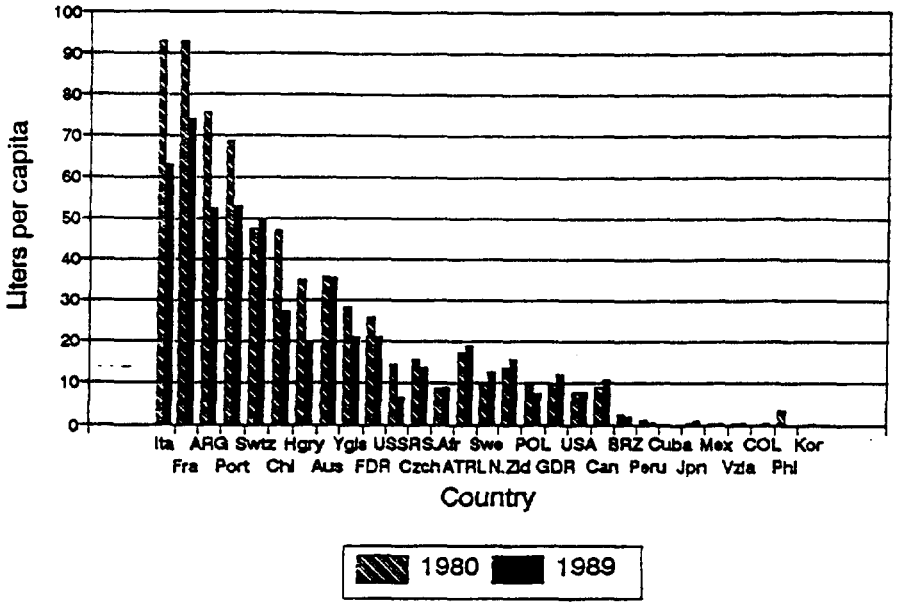


Figure 4
Wine Consumption Per Capita
By Country, highest to lowest



Production of alcohol for consumption

Total world production of beer nearly doubled between 1970 and 1989, increasing from 647 million hectoliters (mhl) in 1970 to 1115 mhl in 1989. During this period, production in Africa, Asia, and Latin America increased from 13 percent of world production to 29 percent. Increased output in a relatively small number of countries accounted for the majority of the rise in production. In Korea, for example, beer production increased from 0.9 millions hectoliters in 1970 to 12.1 mhl in 1989. Production also increased dramatically in Latin America. Between 1970 and 1989, Brazil increased production from 10.3 mhl to 55 mhl, Colombia increased from 7.2 mhl to 18.2, and Venezuela experienced a nearly three-fold increase, from 4 to 11 mhl. Regional production, which reflects these trends, is displayed in figure 5 for the period 1970 to 1989, while more detailed information is contained in Annex tables A-5.

Data on wine and spirits production are less reliable and less current. Data on wine production between 1948 and 1980, reveals that production of wine has increased considerably in Latin America, Europe and North America, while total world production has increased 23 percent. Data in Annex table A-6 for the period between 1965 and 1989 show that production of wine has increased dramatically in South Africa, Mexico, and Czechoslovakia, while it has fallen in traditionally high producer countries such as France and Italy. Although the trends are subject to fluctuations, there is a distinct upward trend in production (See figure 6). The increased wine production, combined with a concurrent fall in consumption in many of the heaviest wine drinking countries, has led to a growing surplus of production over consumption. The surplus in wine might lead to a decline in prices, which could lead to an increase in consumption in many developing countries. The underlying rate of growth is, however, much less rapid than that for beer or spirits, and the share of wine in world markets has therefore declined.

The production of spirits is concentrated in Europe, the Commonwealth of Independent States, the US and Canada. Annex Tables A-7 and A-10 present the available data on spirits production in 1965 and 1980. Total production per capita is very low for Africa, Asia (excluding Japan), and Australia and New Zealand. The available data indicate that production has declined in Latin America and increased in North America, Japan, and Europe.

Figure 5

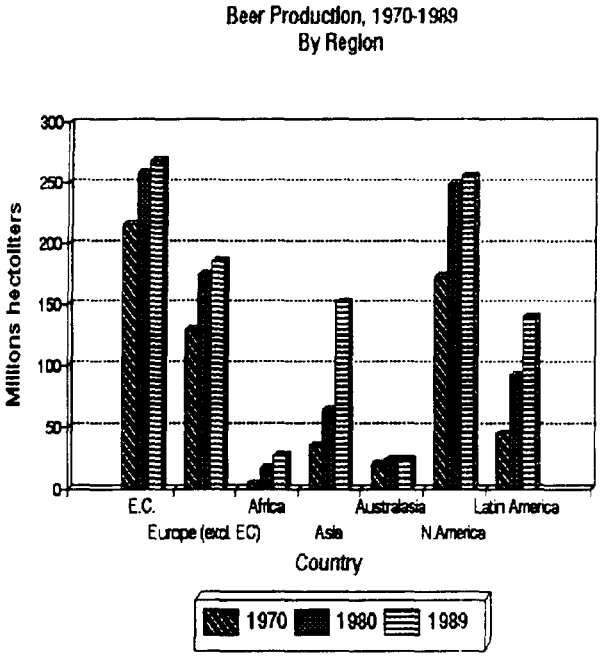
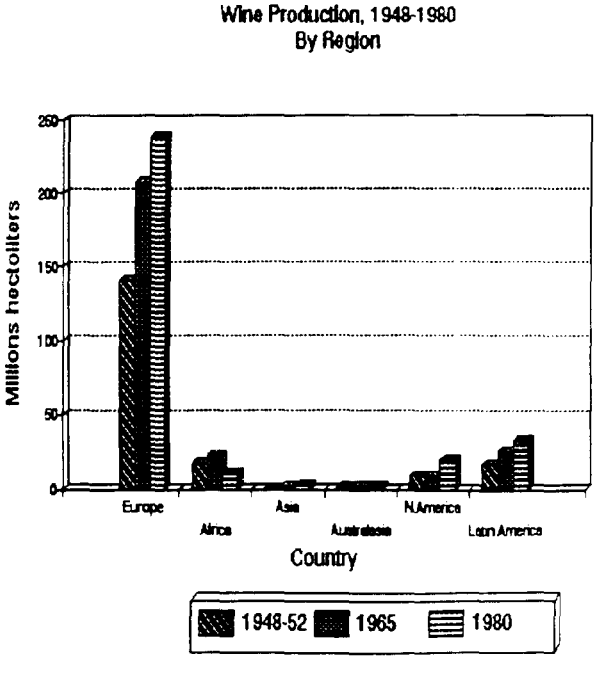


Figure 6



Trade in beer, wine, and spirits

Technical improvements in production technology, pasteurization and packaging, have made it possible to ship beer over long distances, particularly where there is recognition of imported brands. Nevertheless, only 2.4 percent of world beer production entered into international trade in 1981, compared to 1.5 percent in 1960 (WHO 1985).

Annex Table A-11 shows the import and export value of beer from 1970 to 1989. Many of the developing countries experienced dramatic export growth during this period. In Africa, for example, export increased 14,000 percent in Mali and 617 percent in Cameroon. Asia has also experienced dramatic increase in production and export. For the region as whole, production increased from 34.9 mhl in 1970 to 152.3 mhl in 1989. Much of this growth has come from China where production increased from 1.2 mhl in 1970 to 66.0 mhl in 1989 and export value increased from $4 million to $25 million.

Although many developing countries are acquiring wine growing technology, ninety percent of the supply of wine in world markets is dominated by a small group of five industrialized countries. The import of wine is also limited to a small group of industrialized countries, evinced by the fact that Great Britain, the United States, and Germany accounted for over 50 percent of all wine imports in 1980 (WHO, 1985). In general, the pattern of trade in wine is that the most expensive varieties enter the export trade, while the less expensive, lower quality wines tend to be consumed domestically.

As with beers and wines, only the higher quality and more expensive spirits tend to enter the international market. International trade is also heavily concentrated in a few countries. The primary exporter is the UK with nearly 50 percent of all exports and the principal importer is the USA with around 32 percent of the market. Once data has been collected on consumption and production and a basic list of alcohol-related problems has been decided upon, the next step is to examine the trends in alcohol-related mortality and morbidity.

IV. Levels and Trends in Alcohol-Related Mortality and Morbidity

One useful measure, in trying to assess the impact of alcohol consumption on mortality, is to calculate the age-standardized mortality rates for alcohol-related diseases and then to compare the rates across countries. Table 2 lists the age-standardized mortality rates for the four principal alcohol-related diseases across countries. Analyzing the age-standardized mortality rates in relation to the per capita consumption of a specific country may reveal interesting trends. Using Costa Rica as an example, we compare mortality data from table 2 and figure 7 with consumption data from Annex table A-1. The data are revealing. Age-standardized mortality data in table 2 indicates that Costa Rica experiences high mortality rates for cancer of the liver and cirrhosis, 7.47 and 11.96, respectively, while figure 7 shows that between 1983 and 1986 the number of deaths attributable to cirrhosis increased for every age group. These elevated rates may be partially explained by the consumption data in Annex Table A-1, which indicate that between 1970 and 1989 total alcohol consumption in Costa Rica increased from 2.2 to 3.2 liters of alcohol per person (this figure is likely much higher if only the population over 15 is considered).

Figure 7

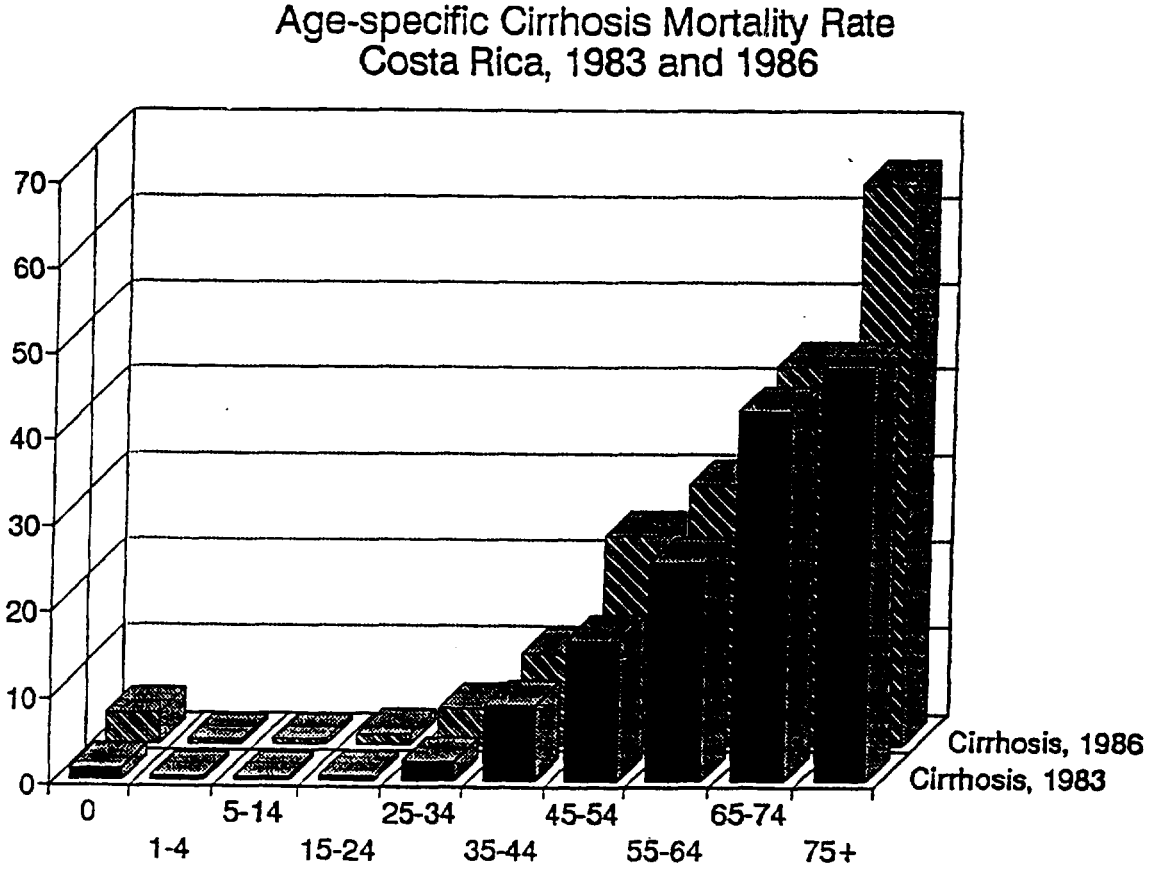


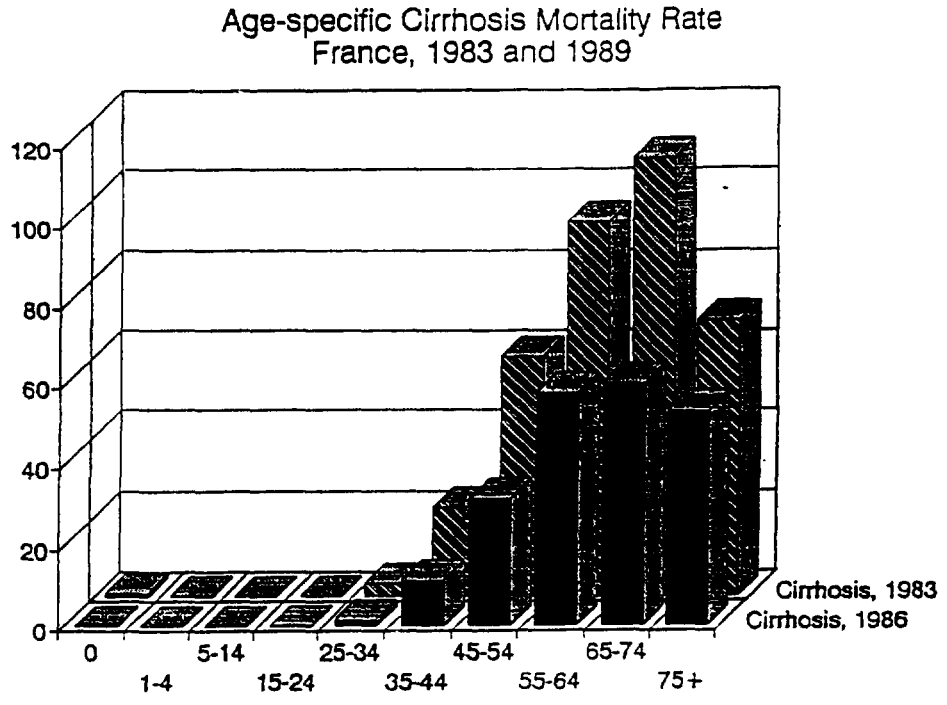
TABLE 2
Age-Standardized Mortality Rates for Alcohol-Related Diseases

Country	Cancer of Oesophagus	Cancer of Liver	Alcohol Dependence Syndrome	Cirrhosis of Liver
Argentina	5.43	4.35	2.27	9.52
Canada	2.45	1.21	1.40	6.67
Chile	5.69	3.22	1.11	23.44
Costa Rica	3.12	7.47	2.19	11.96
Cuba	3.18	1.83	0.74	7.45
Mexico	1.30	1.26	4.90	33.97
Peru	0.75	1.42	1.43	11.13
U.S.A.	2.69	0.99	1.66	8.66
Venezuela	2.10	1.72	1.33	12.25
Philippines	4.43	0.00	--	--
Thailand	--	--	--	--
Czechoslovakia	2.29	3.53	1.46	17.01
Denmark	0.77	0.26	--	--
France	5.75	3.23	3.57	13.36
Germany, D.R.	2.06	1.29	6.17	13.67
Germany, F.R.	2.80	1.63	3.68	14.58
Hungary	3.60	5.17	4.83	38.01
Italy	2.38	4.21	0.35	17.37
Poland	2.45	6.10	1.6	8.19
Portugal	3.02	1.14	0.42	17.49
Spain	2.89	1.58	0.48	15.34
Sweden	1.80	1.61	3.15	4.42
Switzerland	5.360	0.09	--	--
USSR	4.63	--	--	--
U.K.	5.22	0.83	0.37	4.25
Yugoslavia	1.83	0.00	3.57	14.50
New Zealand	3.53	1.51	0.46	2.98

Source: Mortality Data, International Classification of Disease, WHO, 1989.

In comparison, during the same period in France, alcohol consumption per capita declined from 17.3 liters per capita to 13.2 liters per capita. The consequences of this decline are shown in figure 8, which shows that cirrhosis deaths decreased for nearly every age group between 1977 and 1989.

Figure 8



The evidence from these two countries underscores the potential effect of changes in alcohol consumption on society. Changes in per capita consumption of alcohol can have a significant impact on mortality within a country. More importantly, household level effects of alcohol-related diseases may have an even greater effect on the poor, who are more exposed to other risk factors for chronic disease, harder to reach with IEC, and less likely to have access to appropriate medical care. The degree to which alcohol-related diseases affect the poor in developing countries is unknown. However, it has been shown for other diseases that premature death and disability among the poor is likely to have a more significant impact on the health and economic well-being of the household. In addition, because alcohol is an addictive substance (whether it is because of genetic, behavioral, or chemical factors) and due to a lack of information on the part of consumers, households may not be maximizing their welfare in choosing to consume alcohol over other consumer goods.

Alcohol-related mortality

The consequences of excessive alcohol consumption are alarming. Of the approximately two million people who died from alcohol-related causes in 1989, 5 percent died in motor vehicle accidents, about half died from cirrhosis of the liver, another 10 percent died of alcohol dependence syndrome and 32 percent died of either cancer of the oesophagus or cancer of the liver (See Table 3).

The use of mortality data (alcohol-related deaths/total deaths) presented in Table 3, underestimates the problem of alcohol abuse, since most of the costs of alcohol abuse arise from nonfatal

TABLE 3
Worldwide Deaths Attributable to Alcohol

Cause of Death	Total Deaths	% Alcohol Related	Alcohol-Related Deaths	Selected References
Motor Vehicle Accidents	214,208	50 %	107,104	1
Cancer Oesophagus	805,980	75	604,485	2
Cancer Liver	488,060	15	73,209	3
Alcohol Dependence Syndrome	279,930	100	279,930	4
Cirrhosis	2,094,110	50	1,047,055	5
Total			2,111,783	

Sources: (1) Parker, 1987; (2) Rothman, 1980; (3) ibid; (4) By definition; (5) Harwood, 1984; Cruze, et al., 1981; Hyman, 1981.

disease and injury.[2] Estimating the impact of these diseases and injuries related to alcohol abuse is complex, and requires surveillance data that are currently inadequate in both developed and developing countries, despite the large social and economic effects of these conditions. It is clear, however, that alcohol abuse creates increased demand for services in a variety of areas, including, *inter alia*, direct medical treatment for conditions stemming from alcohol abuse (e.g. physician fees, medication costs, and other health care charges), alcohol-related support services which include increases in program and health insurance administration, research, and medical facilities construction and reduced productivity both in terms of short-term absenteeism and on-the-job reductions in productivity due to alcohol abuse. The following section, reviews survey evidence on the prevalence of alcohol-related problems in several developing countries.

[2] As in any estimate based on a hypothetical causal relationship, these figures must be interpreted with some care. In particular, great care must be taken to use changes in mortality as an outcome measure of alternative policy options. For example, the figures on alcohol related traffic fatalities over estimate the potential lives saved from reductions in the number of accidents because the figures in Table 3 refer to reductions in the number of accidents, not directly to the reductions in the consequences of accidents. For instance, alcohol-related accidents more frequently involve only a single car and driver than do accidents in general (Reed, 1981). Consequently, a reduction in the number of people actually killed, the number of people injured, and the amount of property damage will be less than the reduction in the number of accidents implied by reducing the blood alcohol content to zero.

Evidence from developing countries

In the last decade, the level of alcohol consumption in developing countries has increased significantly. Although the social and economic costs of the problems associated with excess consumption are unknown, evidence from household surveys in LAC on the prevalence of illicit substances and from the literature in other developing countries confirms that alcoholism and alcohol-related problems have emerged as priority public health concerns in several Latin American countries.

In Colombia, for example, data from a questionnaire used to evaluate alcoholism indicate that 71 percent of the male study population (56 % of total population) used alcohol in the prior year. Specific questions used to evaluate the population at risk of alcoholism indicate that 7.3 percent of the total study population was at high risk of alcohol dependence, while another 8.1 percent was classified as alcoholic. Evidence of prevalence among adolescents indicates that a large percentage of the 16-19 age group was at high risk of becoming alcoholic. Even more alarming, is evidence of the impact of alcohol abuse on morbidity from several other studies of hospital patients in Latin America and one study in Kenya.

In 1984, 21 percent of all people treated for injuries in Mexico City's emergency rooms had positive alcohol readings (more than 10 mg of alcohol per 100 ml of blood) and similar levels were found in 22 percent of the emergency room cases in Acapulco in 1987. Additional research in La Paz, Bolivia found that 26 percent of the hospitalizations, during the survey period, were for alcohol-related problems. Studies designed specifically to gauge the prevalence of alcohol-related problems among the poor (Brazil 1965 and 1974), found that in peri-urban areas 6 percent of the persons in the survey were "pathological drinkers" and the alcoholism rate was as high as 23 percent in some of the marginal areas. A similar study at a rural district hospital in Kenya found that 54 percent of the male and 25 percent of the female outpatients met a predefined criteria for alcohol abuse and/or alcoholism.

In addition to the direct affect of alcohol on increased morbidity and mortality, alcohol also produces equally damaging secondary effects. These range from the less obvious damaging effects on the family to incarceration, suicide and even homicide. In fact, a 1985 study in Mexico found that nearly 50 percent of those convicted of homicide admitted to having consumed an excess of alcoholic beverages prior to committing the crime (Medina-Mora 1990). While it is difficult to measure the impact of these problems on society, government intervention in the form of social programs is warranted to ameliorate the burden on the families of alcoholics.

As this section and the section on the cost of alcohol-related problems show, the impact of alcohol-related problems is not insignificant and whether the problem is cirrhosis of the liver or family abuse, alcohol-related problems are an increasing problem for developing countries. Moreover, increasing levels of income and rapidly expanding populations, a general lack of regulations and low consumer information make the developing countries an excellent market for beverage companies. While these problems have a yet untold cost to less developed societies and economies, without changes in laws and regulations which govern advertising and taxation, alcohol-related problems will only increase in the years ahead.

V. How Much do Alcohol-Related Problems Cost?

To date, there has been no study of the net cost of alcohol-related problems in developing countries. In the past several years, however, research has begun to examine the prevalence of alcohol-related problems in developing countries (See Section IV, *Evidence from developing countries*, Aguilar (1990), Galvis and Murrelle (1990), and Obot (1990)) which could later form the basis of cost studies. Although, little attempt has been made to analyze the impact of these problems on society and the household, it is now widely accepted that alcohol misuse is an important correlate of a wide range of accidents, illnesses and law enforcement problems. The question that remains is, what is the cost of these problems to society and what can be done to mitigate the effects, both social and economic. This section will highlight a few of the social and economic costs of alcohol abuse and provide several estimates of the cost of alcohol-related problems in developed countries, while the next section will discuss the interventions available to government.

Costs associated with alcohol consumption

The consequences of alcohol abuse are significant, not only in terms of the adverse health effects and the health care costs, but also in terms of foregone earnings and decreased productivity. In order to justify policy changes, economists and public health specialists attempt to assess the social and economic (private) costs of alcohol related problems. The principal costs imposed by alcohol-related problems are generated by:

(1) **Economic Cost of Foregone Earnings from Premature Mortality due to Alcohol Consumption.** The cost of premature mortality (e.g. traffic accidents or cirrhosis) can be valued using the standard approach to estimate the economic cost of loss of life by assigning value to the output lost during the years that the deceased might otherwise have been living. Using the human capital method for valuing life and the standard procedures for calculating the present value of future earnings and household services the economic cost is then calculated.

(2) **Direct Cost of Increased Morbidity**. Excessive consumption of alcohol is a causal factor in the increased demand for medical services. This can be the result of increased risk from other risk factors or through a direct link between alcohol consumption and health status. Alcohol related costs secondary to the increase in medical costs created by rises in mortality and morbidity (often referred to as direct costs) include personal health care expenditures for the prevention, detection, treatment, and rehabilitation of alcohol related diseases (hospital costs, physician fees, medication costs, nursing home costs, dental services, and additional charges).

(3). **Indirect Cost of Added Morbidity.** Increased illness also contributes to a decline in the productivity of the economically active population. Moreover, alcohol has been shown to have a significant impact on unemployment and income (Mullahy, 1991).

Although it is difficult to estimate the real costs of alcohol related problems in practice, it is clear that the social and private costs are significant. The literature highlights six categories of alcohol related costs that should be considered in the net cost calculation. These categories are:

- Reduced productivity
- motor vehicular-related property damage and insurance
- incarceration

- fires
- fetal alcohol syndrome
- child abuse

Calculating the alcohol related costs associated with each of the above categories, a recent study on the social and economic costs of alcohol abuse in Minnesota for 1983 found that the total cost of alcohol related problems in Minnesota was between $1.4 and $2.1 billion for 1983. This represented between 3.9 percent of medical care costs and 26 to 39 times the revenues generated by excise taxes on alcohol. U.S. costs associated with alcohol related mortality are estimated at $9.5 billion or 4.3 percent of 1980 US personal health care expenditures (Cruze A. et al, 1981). A study completed in 1979, estimated the social costs of such problems in the US at more than $113 billion (Shrifin, 1983). The distribution of costs for each of the above mentioned studies is shown in tables 3 and 4.

Table 3
The Cost of Alcohol Abuse in Minnesota, 1983

Category	Value of Losses (US$)
Mortality Costs (indirect)	320,000,000
Medical Care Costs (direct)	195,000,000 - 363,000,000
Social Costs (direct and indirect)	
Reduced productivity	630,000,000 - 1,194,000,000
Long-term disability	72,000,000
Motor vehicle	40,000,000
Driving and liquor offenses	51,000,000
Fires	3,000,000
Fetal alcohol syndrome	42,000,000
Child Abuse	17,000,000
Total Cost (w/out employment and long-term disability cost)	679,000,000 - 847,000,000
Total (w/ employment and long-term disability cost)	1,361,000,000 to 2,113,000,000

Source: Parker, 1987.

Table 4
Estimated Cost of Alcohol-Related Problems in United States

Category	Estimate Cost (US$)
Lost Production	
Civilian	77,090,000,000
Military	454,000,000
Health Care	20,465,000,000
Road accidents	6,768,000,000
Fire losses	647,000,000
Violent crime	4,477,000,000
Social response	3,467,000,000
Total	113,368,000,000

Source: Schifrin, 1983

In addition to the costs mentioned above, society has to provide additional resources for welfare programs for alcohol abusers and their families; some of these programs are specifically designed to mitigate alcohol related problems and cover aspects such as detection, prevention, treatment, rehabilitation, research, and education. While it is extremely difficult to develop an exact estimate of the costs related to alcohol consumption, it is fairly clear that eliminating even a relatively small proportion of the costs associated with alcohol consumption would generate important savings.

Benefits associated with alcohol consumption

Over the years, various articles and studies have extolled the beneficial effects of moderate alcohol consumption. The benefits of alcohol production and consumption fall into two general categories. First, the medical and psychological benefits, followed by the less well analyzed economic benefits.

Although it is particularly difficult to quantify the health benefits from consuming alcohol, a wide body of literature discusses the positive health implications of moderate alcohol consumption, typically by analyzing the impact of drinking patterns on the incidence of various diseases associated with alcohol. The Fourth Special Report to the United States Congress on Alcohol and Health considered the moderate drinker as one who consumed 0.22 to 0.99 oz. of ethanol per day and the light drinker as one who consumed 0.01 to 0.21 oz. per day[3]. Medical evidence indicates that drinking in moderation may have positive health effects. A number of studies (Baum-Baicker, 1985) confirm a negative association between alcohol use and ischemic heart disease (IHD). Additional evidence shows that moderate intake of alcohol can also lower the risk of high cholesterol. The literature on the benefits of alcohol typically emphasizes that moderate drinking can have positive health effects, such as a lower rate of coronary heart disease (CHD).

[3] An alternative definition, dependent on body weight, is that intake of alcohol should not exceed either 0.8 g/kg of body weight on any 1 day nor an average of 0.7 g/kg of body weight in any 3 day period.

The evidence of the benefits of alcohol intake relies on the observed correlation between low levels of ischemic heart disease mortality and moderate drinking. At a macro level, lower levels of coronary death are associated with increasing consumption of wine in the United States and with above average levels of consumption in France. Furthermore, a lower risk of hypertension has been reported for moderate drinkers (0.22 to 0.99 ounces per day) rather than for abstainers or those having more than 3 drinks per day (Baum-Baicker, 1985).

The preceding section discussed a few of the medical benefits which are ascribed to the consumption of alcohol. The economic benefits are also difficult to quantify, but may be expressed in terms of consumer and producer surplus. On the consumption side, consumers of alcoholic beverages benefit from the satisfaction or utility derived from drinking. The purchasing price of alcohol is generally a price which is below the maximum price that the consumer is willing-to-pay. The difference between the price that consumers are willing-to-pay for all levels of consumption and the market price is defined as the *consumer surplus*. The amount spent on alcoholic beverages by consumers is then the minimum value of this benefit to the consumer.

In many developing countries the relative importance of the production and distribution of alcohol in the economy appears to be increasing. It has been argued that the production and distribution of alcoholic beverages can play a supporting role in development, as the beverage industry may be a significant part of employment and can encourage the development of ancillary industries which supply needed input for alcohol production but also foment the development of infrastructure for other industries. According to proponents of developing alcohol production, setting up a brewing industry in a developing country uses indigenous raw materials, introduces simple industrial discipline and techniques, stimulates construction, and reduces the flow of foreign exchange outside the country for the purchase of imported beverages. There is little evidence to support these claims, however. Moreover, the raw materials, energy sources, and capital needed by the industry are imported, and many of the profits will not be reinvested in the country.

One possible crude measure of the value of production and distribution of alcohol is *producer surplus*. Producer surplus represents the difference between the incomes and rents (profits) received for the production and distribution of alcoholic beverages at the market price minus the incremental cost of production. In addition, if the other commodity markets, i.e. the glass market, are perfect, the calculation of producer surplus includes the value of the secondary effects of ancillary industries discussed in the preceding paragraph.

Government intervention to ameliorate alcohol-related problems should be dependent on an analysis of the costs and the benefits to society versus the effectiveness with which government can reduce the burden of the alcohol-related problem. The following section will discuss the role of government with respect to alcohol-related problems and the various policy instruments available to government policymakers.

VI. Role of Government and Policy Options

The World Health Organization defines alcoholism as a disease. One interpretation of this definition is that alcoholism prevents consumers from making rational decisions, in that an alcoholic is not free to choose whether or how much he will consume. If this is accepted, alcoholism, in and of itself, is a market failure. There are other market failures associated with the consumption of alcoholic beverages. The three most notable, with respect to alcohol, are (i) externalities, (ii) lack of well-informed consumers, (iii) and public (non-excludable) goods. Government intervention to mitigate the effects of market failure is warranted, on efficiency grounds, when private markets fail to translate individual decisions based on private considerations into social values. However, even if the economy generates an efficient allocation of resources, government intervention may be justified to achieve a "fair" distribution of utility. Nevertheless, efficiency is the primary criterion for government intervention in the case of alcohol. It must be emphasized that while distributional and market failure problems provide opportunities for government intervention, they do not require it.

The fact that alcohol abuse contributes to the death of more than 2 million people annually (a tragedy in and of itself) only identifies it as a policy priority. One might argue that the consumer's ignorance (either because alcohol is addictive or because a lack of information prevents the consumer from adequately assessing risks) causes the market to fail to society's detriment, and, therefore, public sector intervention is warranted. Intervention is not justified, however, unless we can assess actual outcomes when the public sector does or does not intervene. For example, if it could be determined that by increasing the drinking age to 21, government, or the Ministry of Health, could decrease the number of traffic accidents, then public sector intervention could be considered necessary and sufficient. Alternative strategies should be implemented not on the basis of the magnitude of the problem, but rather on the basis that social welfare maximization of rational consumers is impeded by the presence of the market failure and on the likelihood that the policy change will actually reduce mortality and morbidity attributable to alcohol consumption. Some of the interventions available to the public sector will be discussed in the following section.

In designing policies to maximize social welfare, it is clear that alcohol consumption and the related problems of mortality, morbidity, and the secondary effects need to be addressed. The need to address these problems is particularly salient given that people in the age groups 15-24 and members of the lower income groups are the most likely to experience problems related to intoxication. Younger people and the poor tend to have a higher discount value and therefore systematically underestimate the effects of alcohol consumption. Moreover, the lower income groups are often more susceptible to other risk factors and are, therefore, more likely to suffer a debilitating illness due to the over-consumption of alcohol. From a policy perspective, it is also more difficult to influence the behavior of these populations (young and poor) *because* they discount the future more than other groups of consumers. The following section will discuss a range of policy levers available to decision makers.

Policy options

Interventions available to policymakers aim either to lower lifetime consumption of alcohol or to limit the number of cases of periodic intoxication. This is in accord with the classification discussed earlier (see Section II). Policy interventions related to prolonged consumption (group I) can be grouped into *ex ante* interventions designed to lower the probability of contracting cirrhosis or cancer, primarily by lowering per capita consumption, and *ex post* treatments to extend the number of years of life and to reduce pain and suffering by providing health services, such as chemotherapy or palliative care.

Given that the majority of the direct effects related to group II problems are accident and motor vehicle related, policies oriented toward a reduction in the number of cases of periodic intoxication aim to lower the morbidity and mortality associated with drinking and driving accidents. Because the number of offenses committed by an individual is inversely related to the cost of each offense, many of the policy interventions attempt to reduce drunk driving *ex post* by imposing mandatory penalties (pecuniary and non-pecuniary) for conviction of driving under the influence, open container laws, and minimum legal drinking ages for alcoholic beverages. *Ex ante* efforts to limit periods of intoxication include regulations on advertising, excise taxes, and information and education campaigns to inform consumers of the potential hazards of excessive drinking. It is in this area that the most promise for reducing alcohol-related problems lies.

It is reasonable to assume that the full costs to society of alcohol consumption in the form of negative externalities are not fully reflected in a free market price. Given that one response of government to an externality is the imposition of a tax that causes producers of the externality (alcohol abusers) to internalize the additional social cost (or benefit) of their actions (Pigou, 1947), it would seem that setting prices so that private costs and social costs are in alignment would be an excellent government policy. Moreover, existing econometric evidence suggests that the demand for beer, wine and spirits is price inelastic--between -0.11 for beer and -0.61 for spirits--and the inverse elasticity maxim of public finance would therefore suggest higher proportional taxes on these commodities[4]. However, price elasticities should not be considered in isolation from other influences of consumption. The evidence of income elasticities greater than 2.0 for spirits and as high as 1.9 for wine suggests that any effect on consumption of an excise tax could be rapidly eroded with income growth. Further, even if alcohol users face all the relevant costs of their actions consumption could still be excessive if users underestimate the potential hazard due to imperfect information.

From a public health perspective changing tax rates is also a good way to influence consumer behavior. In addition to reducing consumption, taxation of alcohol production and consumption also generates government revenues through taxes on industry and excise taxes. Heavy taxation, on the other hand, may stimulate illicit production and black market sales as witnessed by the period of prohibition in the United States, and more importantly, reduce the disposal income of heavy drinkers and their families as a larger and larger share of disposable income is spent on alcohol.

The effectiveness of these interventions can evaluated by following the *ex ante/ex post* framework developed in the previous section. The effectiveness of *ex post* treatments associated with cancer of the liver and esophagus and cirrhosis of the liver is approximated using data from Barnum and Greenberg on the change in survival rates for cancer in the United States.[5] From 1950 to 1980, the relative survival rates for esophageal and liver cancer show little improvement. Due to the level of technology needed

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[4] Evidence from econometric analyses of the demand for alcoholic beverages in industrialized countries indicates that own price elasticities range from -0.11 to -0.29 for beer, from -0.23 to -0.77 for wine and from -0.11 to -0.61 for spirits (Clements and Selvanathan, 1991).

[5] Barnum estimated the benefits in less developed countries of treatment in a higher level hospital with relatively modern technology in comparison with treatment at an entry level hospital, with no treatment, and with only palliative care. To approximate the various levels, higher level hospitals were equated with the 1975/80 level of U.S. care and low level was compared with the 1945/50 level of care in the U.S. hospitals (Barnum and Greenberg, HSPR, 1991).

to treat cirrhosis, it is likely that cirrhosis survival rates in developing countries are also low, and that the years of life gained (YLG) through curative treatments is, therefore, likely small as well.

The effectiveness of non-curative interventions can be estimated by globally measuring the number of deaths averted by various policies. Although outcomes are measured in terms of the number of deaths averted, the overall objective of these interventions is to lower the consumption of alcoholic beverages. The efficacy by which lower consumption reduces the number of alcohol-related problems is highlighted in the historical examples of Prohibition in the U.S. and wine rationing in France between 1942 and 1948. In the latter case, upon the enactment of wine rationing, the cirrhosis mortality rate in Paris declined from 35/100,000 in 1941 to a low of 6/100,000 in 1945 and 1946, quickly returning to its former level following the repeal of wine rationing in 1948 (Terris, 1967, p. 2077)

To the extent that reductions in consumption translate into reductions in alcohol-related problems, one of the most promising non-curative interventions is taxation. Evidence indicates that adjusting the tax rates to cover the social and economic costs of alcohol abuse is an effective measure in reducing the burden on society by raising the price of alcohol and consequently lowering demand. Yet, surprisingly, there are very few studies which examine the manner in which increased prices lower alcohol consumption. Cook and Tauchen examined cirrhosis mortality data and consumption by chronic heavy drinkers and found that alcohol taxation can be used as an effective policy lever. In particular, they found that a one dollar increase in the liquor excise tax per gallon proof reduces the liver cirrhosis mortality rate by 5.4 percent in the short term and perhaps twice that in the longer term. Using 1986 as the base, this translates into between 1,400 and 2,600 deaths averted. In a related study, Charles Phelps, 1988, estimated the optimal tax rates for beer in the U.S. He also concluded that beer taxation reduces both beer consumption by youths and the auto fatalities they cause; fatalities drop by 33 percent in response to a 20 percent tax and 40 percent in response to a 30 percent tax[6]. Given the weak tax administration in many developing countries, eagerness to raise taxes on alcohol should be tempered by the recognition that there are many other ways to lower alcohol consumption.

A 1991 study by Saffer and Grossman estimated the impact of a range of policy options on the number of motor vehicle fatalities in the U.S. The results indicate that the most effective policies are increased alcohol taxes and mandatory administrative license actions. Through various policy simulations, they found that increasing the beer tax to a value equivalent to the real 1951 value would have averted 5,174 deaths (32% of these deaths would be among the 18-20 year old age group); while mandatory license sanctions would have reduced fatalities by 9 percent or 4,202 deaths (19% in the 18-20 year old range). The next most effective policies were a minimum legal drinking age and relatively large mandatory fines, which reduced fatalities by about 5 to 6 percent. Laws such as seat belt requirements, mandatory jail sentences, and open container laws had a very small deterrent effect on drunk driving.

Information and education campaigns and restrictions on advertising also change behavior--though there is very little empirical evidence. The evidence that does exist (Saffer, 1989) shows that countries which have adopted bans on beer and wine advertising have about 23 percent lower alcohol consumption and traffic fatalities than countries with no bans.

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[6] Unfortunately, Phelp's study is weakened by the fact that he does not take into account substitution between beer and other alcohol substitutes, and therefore overestimates the amount by which a tax on beer alone reduces total consumption, drunk driving, and traffic fatalities. On the other hand, beer taxes may also reduce alcohol-related costs not associated with traffic accidents.

Cost-effectiveness. While a rigorous cost-effectiveness analysis is beyond the scope of this paper, the cost-effectiveness of the alternative policy options should be considered. Although the evidence presented must be interpreted cautiously, the large differences that exist in the impact per dollar spent on alternative interventions points to the appropriate government response. Analyzing the cost per YLG estimates presented by Barnum and Greenberg, it is clear that the high cost treatments associated with esophageal and liver cancer, as well as cirrhosis, are relatively cost ineffective. For example, the cost per YLG from treatment for liver cancer is over 100 times that for cancers of the breast, mouth, and cervix. Furthermore, in a developing country setting, the marginal cost of such a treatment is surely much higher, as resources directed to high cost treatments divert valuable resources from basic activities, such as immunizations and the provision of safe water, which have large positive externalities[7].

On the other hand, policy changes which either alter the consumption of alcoholic beverages, e.g. increased excise taxes or advertising, or alter the behavior of intoxicated consumers, such as a one year license sanction and a $500 fine for driving under the influence, have a low cost per death averted. In fact, in many cases the only cost associated with the policy change is the political cost plus a small increase in administrative or personnel costs. The fact that a large share of the deaths averted by such policies come from the 18-24 age group, primarily due to motor vehicle fatalities, indicates that the cost per discounted year of life gained is probably even lower expected. Because it appears the cirrhotic process can be slowed or accelerated in response to changes in the rate of alcohol consumption, policies which decrease per capita consumption are likely to be highly cost-effective[8].

Final considerations in designing government policy. Designing a government policy to diminish the impact of alcohol-related problems, using many of the policy instruments discussed earlier, is a complex, multi-dimensional problem. It is critical to remember that reductions in alcohol consumption will affect the economy in a variety of ways. To name a few: government revenues will fall (excise taxes on alcohol account for anywhere from 5 to 15 percent of government revenues), government will, therefore, need to encourage an increase in the production of other consumer goods to meet the increasing demand for goods which are substitutes for alcohol. Furthermore, reductions in alcohol-related deaths may have implications on the social security or insurance markets[9]. The following box examines the impact of alcohol policy in the former Soviet Union to highlight a few of the issues and potential problems related to the design of alcohol policy.

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[7] In considering alternative interventions, it is important to keep in mind that the treatment of cancers and cirrhosis is predominantly a private good in that most--if not all--of the gain in utility is captured by the individual being treated, as opposed to society at large (as is the case with many public goods such as safe water and immunizations). Government should therefore not be directly involved in the treatment of cancers and cirrhosis; a more appropriate role, however, is in the provision of insurance against catastrophic loss or ensuring that private insurance markets function equitably and efficiently.

[8] Studies have found that the probability of contracting cirrhosis is linearly related to lifetime consumption of alcohol, adjusted for body weight. The probability is near zero for subjects who have consumed 4 times their body weight and near unity for those who have consumed 40 times their body weight (Lelbach, 1974). Thus, any policy which interrupts this linear progression should lower the probability of developing cirrhosis.

[9] It has been estimated by the OMB of the U.S. government, that the social security fund will be depleted 47 years *ahead* of schedule due to the reduction in smoking-related deaths brought on by recent policy changes.

Alcohol Policy in Russia: Good Idea...Wrong Approach.

Between 1955 and 1984 alcohol consumption per capita rose 250 percent in the USSR. In 1984, annual consumption per person aged 15 and over was equivalent to roughly 15 liters of absolute alcohol. In a population of 280 million, the number of people dependent on alcohol was estimated at 20 million. The impact of such heavy drinking had a detrimental effect on health status, the economy and the moral climate of the country.

Notwithstanding previous failures with prohibitive policies, Mr. Gorbachev began to clamp down on the sale and production of alcohol. New limits on the production and consumption of alcohol were as follows:

- The sale of alcohol was restricted to between 2p.m.and 7 p.m., and to people over 21.
- The number of alcohol outlets was reduced; only special stores could sell vodka.
- The production of vodka was to be reduced, and fortified wines was phased out entirely.
- The price of alcoholic drinks was increased by 15-25 %.
- Alcohol factories were shut down; vines were uprooted; and liquor stores were closed.

By 1986, the campaign seemed to be working. Sales of absolute alcohol were down from 8.4 liters per capita in 1984 to 3.3 in 1987 and production fell by as much 56 %. More importantly, the campaign was said to have brought about dramatic improvements in health and efficiency; these improvements included a 37 % drop in the death rate among working-age men as a result of injuries, poisoning, and accidents, a 25 % reduction in the crime rate, and a 33 % decrease in absenteeism.

In the longer term, the early success of the program faded. By mid 1987, drunks were reappearing on the streets, home-brew had increased, sugar was being pilfered to produce illegal alcohol, and the state's finances were in a shambles. The cuts in production halved state output, but, in compensation, home-brewing had increased (some estimates indicate that home-brew entirely compensated for reduced state output). Exorbitant prices and sharply restricted supply created a further stimulus for illicit production and distribution.

The impact of these various factors was disastrous for the State's finances. According to official statistics, consumers spent 5 billion roubles less on alcohol in 1985, 15.8 billion less in 1986, and 16.3 billion less in 1987. Government policy which increased alcohol prices only exacerbated the situation, as more roubles were diverted to the black market, and the hole in the government budget expanded. To fill the gap, the government printed more roubles, thereby fueling inflation.

To absorb all the roubles that the people were not spending on state-produced alcohol, the government had planned to increase the output of other consumer goods. In reality, wages kept rising, and government output of substitute goods did not rise rapidly enough. In addition, shortages worsened, queues lengthened, black market trade increased, and consumption of surrogates, such as cologne and shoe polish, increased. These effects placed an additional burden on the police, controlling queues and chasing black-marketers, and on the health system, as the victims of surrogate and poisonous home-brews sought medical care. Over time, the costs of the anti-drink campaign clearly exceeded the benefits.

Source: Economist, December 23, 1989

VII. Conclusion

Although alcohol consumption has fallen in several countries such as France and Italy, alcohol consumption and the related problems have increased in many others. In particular, alcohol consumption seems to be increasing at a rapid pace in developing countries where drinking is a relatively new experience. As per capita incomes rise, trade barriers fall, and alcoholic beverages advance into new markets in developing countries, alcohol consumption is likely to increase. And while the causality between alcohol consumption and alcohol-related problems (deaths), is less than clear, the number of problems and deaths attributable to alcohol consumption will surely rise if governments do not begin to implement balanced, preventive policies to mitigate the impact of these problems.

At a time when most countries are trying to foster the development of human capital, alcohol-related problems impose an unnecessary burden. This burden may also be borne disproportionately by the less fortunate members of society, particularly the poor and young males. Although it is often difficult to design policies to change the behavior of these cohorts, the evidence on the efficacy of policy variables, such as tax rates, drunk driving regulations, driving age, and advertising bans on alcohol-related problems is encouraging. Using these policy instruments, policy makers can effectively target these high risks groups with well-designed policy interventions. Policy makers in developing countries, where many of these policies have not yet been implemented, thus have a baseline of policy options to consider in attempting to reduce the impact of alcohol-related problems within their respective countries.

One of the principal problems in evaluating the impact of alcohol-related problems in developing countries is the dearth of information on alcohol. Although alcohol consumption is generally included in household surveys, alcohol is rarely disaggregated into beer, wine, spirits, or other, and even less frequently analyzed. Future studies might examine household consumption by income group and attempt to assess the effect of consumption on morbidity and mortality within the household. Additional research is also needed on family budget decisions relating to alcohol consumption, the factors governing them and the ways in which the impact of spending on alcohol in "at risk" groups like children and the poor might be moderated.

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1. The * indicates selections which have been included for reference only.

Appendix Tables

TABLE A-1
Alcohol Consumption Per Capita
(Liters per capita)

Country	1970	1980	1985	1989
Austria	10.4	10.9	11.1	11.6
France	17.3	15.5	13.7	13.2
Italy	16.0	13.8	12.4	9.7
Portugal	9.8	11.0	13.0	10.2
W. Germany	12.1	13.4	12.7	12.2
E.Germany	8.0	12.8	13.0	13.8
Czechoslovakia	10.7	11.9	11.5	11.2
Hungary	9.9	12.9	12.6	11.7
Poland	5.4	8.7	7.0	7.0
Sweden	5.4	8.7	5.1	5.4
Switzerland	10.6	10.9	11.3	11.1
USSR	6.5	8.5	7.1	3.8
Yugoslavia	7.9	7.8	7.7	6.4
Nigeria	..	..	..	..
S.Africa	3.0	3.8	4.2	4.8
China	..	..	..	..
Japan(incl.sake)	4.8	5.6	6.1	6.7
Korea,R	..	..	..	1.2
Philippines	..	4.0	3.7	..
Australia	7.8	9.4	9.3	9.0
N.Zealand	6.2	8.0	7.8	7.7
Canada	6.4	8.7	8.0	7.8
USA	7.2	8.6	8.3	7.7
Argentina	..	11.5	8.9	7.7
Brazil (beer & wine)	.7	1.3	1.4	2.4
Chile (beer & wine)	5.6	6.4	5.5	4.2
Colombia (beer only)	1.7	2.2	2.8	2.9
Cuba (beer only)	1.7	1.2	1.3	1.7
Mexico	1.9	2.5	2.3	2.3
Peru (beer and wine)	2.4	1.6	1.6	1.4
Costa Rica	2.2			3.2
Venezuela (beer & wine)	..	3.8	3.1	3.2

Source: International Statistical yearbook, Brewer's Society, 1991.

TABLE A-2.
Beer Consumption Per Capita
(liters per capita)

Region	Country	1970	1980	1985	1989
EUROPE	Austria	98.7	101.9	111.6	119.3
	Belgium	131.8	131.0	121.0	115.0
	Denmark	108.5	130.7	129.8	126.5
	France	41.31	44.3	40.1	39.2
	Greece	9.4	26.3	109.0	90.3
	Italy	11.37	16.7	21.6	21.8
	Netherlands	57.4	86.4	84.4	87.6
	Portugal	13.3	37.9	36.9	63.8
	Spain	38.5	53.4	61.0	72.4
	West Germany	141.1	145.9	145.4	142.9
	Bulgaria	36.5	57.3	63.6	70.3
	Czechoslovakia	139.9	137.8	130.8	131.8
	East Germany	95.7	139.1	141.6	146.5
	Finland	48.8	57.4	61.7	80.4
	Hungary	59.4	87.0	92.4	103.0
	Iceland	13.2	14.4	17.0	30.7
	Norway	37.8	48.3	47.5	51.8
	Poland	31.4	30.4	29.5	31.3
	Romania	21.1	43.8	45.0	50.9
	Sweden	57.5	48.0	46.8	58.0
	Switzerland	78.5	69.0	69.2	69.9
	USSR	17.5	23.1	23.8	21.0
	Yugoslavia	28.0	44.2	48.8	46.0
AFRICA	South Africa	12.1	26.6	39.4	54.4
ASIA	Japan	28.7	39.0	40.6	49.7
	Korea				28.1
	Philippines		3.5		
AUSTRALASIA	Australia	119.4	132.3	114.5	113.1
	New Zealand	116.0	118.0	114.8	117.0
NORTH	Canada	74.0	86.1	82.2	80.2
AMERICA	USA	70.4	91.1	89.7	88.6
LATIN	Argentina	15.4	7.7	13.0	18.6
AMERICA	Brazil	10.6	18.9	22.3	43.8
	Chile	17.9	17.2	16.0	22.1
	Mexico	29.1	39.0	35.0	37.5
	Peru	18.2	30.4	30.0	27.4
	Venezuela	49.5	74.0	59.5	61.8

Source: Brewer's Society Yearbook, 1992

TABLE A-3
Wine Consumption Per Capita
(liters per capita)

Region	Country	1970	1980	1985	1989
EUROPE	Austria	34.6	35.8	34.3	35.2
	Belgium	14.2	17.8	22.7	23.0
	Denmark	5.9	14.0	20.7	19.2
	France	109.1	81.0	79.7	74.0
	Greece	40.0	44.9	42.5	29.9
	Italy	113.7	92.9	84.8	63.0
	Netherlands	5.2	12.9	15.0	14.8
	Portugal	72.5	68.7	87.0	53.0
	Spain	61.5	64.7	48.0	37.6
	West Germany	17.2	25.8	25.4	21.1
	Bulgaria	20.9	22.0	20.2	21.8
	Czechoslovakia	14.6	15.5	16.0	13.8
	East Germany	5.0	9.6	10.3	12.1
	Finland	3.3	4.8	4.5	6.0
	Hungary	37.7	35.0	24.8	20.0
	Iceland	1.8	6.0	7.3	5.7
	Norway	2.3	4.4	5.1	6.6
	Poland	5.6	10.1	7.9	7.7
	Romania	23.1	28.9	29.0	17.2
	Sweden	6.4	9.5	11.7	12.5
	Switzerland	41.9	47.4	49.6	49.6
	USSR	15.2	14.4	11.6	6.5
	Yugoslavia	28.3	28.2	26.5	21.1
AFRICA	South Africa	9.2	8.8	9.20	9.1
ASIA	Japan	0.3	0.5	0.8	1.2
	Korea				0.4
	Philippines		3.5	3.5	
AUSTRALASIA	Australia	9.0	17.4	21.3	19.1
	New Zealand	5.9	13.5	14.4	15.5
NORTH AMERICA	Canada	4.2	9.0	10.2	10.9
	USA	5.0	7.9	9.0	7.9
LATIN AMERICA	Argentina	91.8	75.8	60.1	52.6
	Brazil	1.8	2.6	2.5	1.8
	Chile	40.5	46.9	40.0	27.4
	Mexico	0.3	0.3	0.5	0.3
	Peru	1.1	1.0	0.6	0.6
	Venezuela		0.7	0.7	0.7

urce: Brewer's Society Yearbook, 1992.

TABLE A-4
Spirits Consumption Per Capita
(Liters per capita)

Country	1970	1980	1985	1989
Austria	1.4	1.6	1.5	1.5
France	2.3	2.5	2.3	2.4
Italy	1.8	1.9	1.2	1.1
Portugal	0.5	0.9	0.8	0.8
W. Germany	3.0	3.1	2.4	2.5
E.Germany	2.6	4.7	4.8	5.0
Czechoslovakia	2.4	3.5	3.4	3.4
Hungary	2.7	4.8	5.5	4.7
Poland	3.2	6.0	4.6	4.5
Sweden	2.6	2.7	2.1	1.9
Switzerland	2.0	2.0	2.2	1.9
USSR	3.8	5.7	4.5	2.0
Yugoslavia	3.1	2.2	2.1	1.6
Nigeria	..	..	..	..
S.Africa	1.3	1.3	1.1	1.0
China	..	..	..	..
Japan	1.1	1.8	2.4	2.1
Korea,R	..	..	..	..
Philippines	..	2.9	2.7	..
Australia	1.0	1.0	1.2	1.3
N.Zealand	1.1	1.9	1.7	1.4
Canada	2.2	3.3	2.6	2.5
USA	3.1	3.1	2.7	2.3
Argentina	..	2.0	1.0	0.4
Brazil	..	..	..	..
Chile	..	...	..	..
Colombia	..	..	..	..
Cuba	0.8	..	..	..
Mexico	0.7	0.9	1.0	0.8
Peru	1.4	3.0	3.0	..
Venezuela	..	..	..	..

Source: International Statistical yearbook, Brewer's Society, 1991.

TABLE A-5a
Beer Production
(Millions hectoliters)

Country	1970	1980	1985	1989
Austria	7.2	7.5	8.7	9.2
France	20.3	21.6	20.3	20.9
Italy	6.0	8.5	10.3	10.4
Portugal	1.4	3.6	3.7	6.8
W. Germany	87.1	92.3	93.3	93.0
E.Germany	16.6	23.6	24.3	24.8
Czechoslovakia	21.2	23.4	22.3	22.8
Hungary	5.0	7.9	8.7	9.7
Poland	10.4	12.9	11.1	12.1
Sweden	4.2	3.8	3.6	4.6
Switzerland	4.8	4.1	4.2	4.1
USSR	41.9	61.4	65.7	60.2
Yugoslavia	6.7	11.8	10.5	11.1
Nigeria	1.1	7.9	10.0	7.0
S.Africa	2.5	8.3	13.0	19.9
China	1.2	6.0	32.0	66.0
Japan	30.0	45.5	48.1	60.5
Korea,R	0.9	5.8	7.7	12.1
Philippines	2.8	7.0	8.0	13.7
Australia	15.5	19.5	18.8	19.5
N.Zealand	3.4	3.8	3.9	4.6
Canada	15.8	21.6	22.1	22.7
USA	158.0	227.8	226.8	233.6
Argentina	3.4	2.3	4.0	6.1
Brazil	10.3	29.5	30.3	55.0
Chile	1.8	1.9	1.9	2.8
Colombia	7.2	11.9	15.0	18.0
Cuba	1.0	2.4	2.6	3.3
Mexico	14.4	27.3	29.1	38.7
Peru	2.3	5.3	5.5	5.4
Venezuela	4.3	11.1	1.2	11.0

Source: International Statistical yearbook, Brewer's Society, 1991.

TABLE A-5b
Beer Production, 1987 and 1989
(million hectolitres)

Country	Population 1989 (millions)	1987	1989
Albania	3.20	0.1	0.1
Algeria	24.60	0.75	0.37
Bangladesh	106.51	0.01	0.01
Benin	4.59	0.22	0.21
Bolivia	7.19	1.18	1.0
Burkina Faso	8.76	0.50	0.5
Burundi	5.30	0.83	0.92
Cambodia	8.06	0.01	0.01
Costa Rica	2.92	0.80	0.81
Dominican Republic	7.02	0.97	1.47
Egypt	53.08	0.40	0.46
El Salvador	5.21	0.67	0.68
Ecuador	10.4	2.00	1.7
Ethiopia	49.51	0.96	0.71
Gabon	1.13	1.0	0.8
Ghana	14.57	0.53	0.61
Guatemala	8.94	0.97	0.90
Haiti	5.61	0.03	0.07
Honduras	4.95	0.60	0.74
Hong Kong	5.77	1.36	1.69
India	811.82	2.00	1.72
Indonesia	179.14	0.84	0.99
Iran	54.20	0.10	0.20
Israel	4.51	0.42	0.70
Jamaica	2.38	0.80	1.00
Jordan	4.10	0.04	0.04
Kenya	24.87	3.50	3.90
Korea	22.42	1.00	1.00
Lebanon	2.90	0.13	0.13
Lesotho	1.70	0.21	0.31
Madagascar	11.60	0.24	0.25
Malawi	8.02	0.14	0.16
Malaysia	16.96	0.51	0.71

Source: Brewer's Society Yearbook, 1992.

Table A-5b (continued)
Beer Production, 1987 and 1989
(million hectolitres)

Country	Population 1989 (millions)	1987	1989
Mali	7.96	0.08	0.08
Mauritius	1.09	0.26	0.18
Mozambique	15.33	0.21	0.30
Namibia	1.82	0.41	0.50
Nepal	18.44	0.05	0.05
Nicaragua	3.75	0.35	0.30
Niger	6.90	0.10	0.10
Pakistan	108.57	0.01	0.01
Panama	2.37	1.36	0.98
Paraguay Republic	4.16	1.20	1.00
Puerto Rico	3.66	0.38	0.59
Rwanda	6.99	0.64	0.71
Sierra Leone	4.05	0.05	0.04
Sri Lanka	16.81	0.08	0.07
Syria	11.72	0.09	0.09
Taiwan	19.80	3.86	4.00
Tanzania	24.80	0.59	0.54
Thailand	55.45	0.06	1.90
Tunisia	7.99	0.26	0.40
Turkey	56.74	2.50	2.50
Uganda	17.80	0.14	0.13
Uruguay	3.08	0.60	0.65
Vietnam	65.68	2.00	2.00
Zaire	34.49	4.31	3.17
Zambia	7.80	0.80	0.95
Zimbabwe	9.12	1.30	1.80

Source: Brewer's Society Yearbook, 1992.

Table A-6
Wine Production
(Millions hectoliters)

Country	1965	1980	1989
France	68.4	69.1	61.0
Italy	68.2	75.0	60.3
Spain	26.5	42.4	28.9
Argentina	18.3	23.3	20.3
Portugal	14.7	9.4	7.43
Algeria	14.0	2.6	..
USSR	13.4	32.2	19.9
USA	8.5	18.0	15.6
Romania	5.2	7.6	3.6
Yugoslavia	5.2	6.9	4.9
Germany, F.D.	4.6	7.1	..
Greece	4.1	4.4	..
Chile	3.6	5.7	3.9
S. Africa	3.6	6.3	9.4
Morocco	3.5	1.0	..
Bulgaria	3.4	4.0	2.6
Japan	..	..	..
Hungary	2.2	5.7	3.7
Brazil	1.9	1.9	2.7
Tunisia	1.8	0.7	..
Australia	1.8	4.7	4.9
Poland	1.6	3.0	..
Austria	1.4	3.1	2.6
Switzerland	1.0	0.8	..
Uruguay	0.9	0.5	..
Canada	0.8	.45	.57
Czechoslovakia	0.7	1.4	1.39
Turkey	0.5	0.7	..
Cyprus	0.3	0.6	..
Mexico	..	0.7	1.73

Source: WHO, Publication No. 88 and FAO Trade DATA

TABLE A-7
Spirits Production
(Millions hectoliters)

Country	1965	1980
USSR	18.5	22.0
USA	7.7	14.9
United Kingdom	3.6	4.9
France	3.4	2.8
Germany, F.R.	3.3	3.9
Japan	2.9	6.4
Spain	2.0	3.1
Poland	2.0	3.1
Brazil	2.0	..
Argentina	1.6	..
Korea, R.	0.9	5.1
Germany, G.D.	0.8	2.1
Mexico	0.6	1.5
Philippines	0.5	1.1
Canada	0.4	1.7
Bulgaria	0.4	0.5
Czechoslovakia	0.4	1.3
Sweden	0.4	0.5
Colombia	0.3	..
Hungary	0.2	1.1
Finland	0.2	0.6
Austria	0.2	0.4
Algeria	0.2	..
Cuba	0.2	0.4
Jamaica	0.2	0.2

Source: WHO, Publication No. 88.

TABLE A-8
Beer Production, by Region
(Million hectoliters)

Country	1970	1980	1985	1989
European Community	216.8	257.5	258.5	268.2
Rest of Europe	129.2	174.6	181.3	185.5
Africa	3.6	16.2	23.0	26.9
Asia	34.9	64.3	96.0	152.3
Australsia	18.9	23.3	22.7	23.5
North America	173.8	249.4	248.9	256.3
Latin America	44.7	91.7	98.7	140.3

Source: International Statistical Yearbook, Brewer's Society, 1991.

TABLE A-9
Wine Production, by Region
(Million hectoliters)

Country	1948-52	1965	1980
Africa	17.1	23.0	10.9
USA and Canada	9.2	9.2	19.7
Latin America	16.5	25.0	32.7
Asia	0.5	1.32	2.6
Europe	141.3	207.4	238.7
Australia & New Zealand	1.5	23.3	1.8
USSR	0.3	13.4	32.2
WORLD	186.4	281.1	341.4

Source: WHO Publication No. 88.

TABLE A-10
Spirits Production, by Region
(Million hectoliters)

Country	1965	1980
Africa	0.4	0.4
USA and Canada	8.1	16.6
Latin America	5.7	4.9
Asia	1.8	7.4
Australia & New Zealand	0.2	0.1
Japan	2.9	6.4
Europe	12.7	25.5
USSR	18.5	22.0
WORLD	50.5	83.3

Source: WHO Publication No. 88.

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