



REVIEW OF
NATIONAL POLICY MEASURES
TO PREVENT
ALCOHOL-RELATED PROBLEMS

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1. SITUATION ANALYSIS

1.1 Scope and purpose of document

Alcohol-related problems deplete the human and financial resources of many nations. In both developed and developing countries, they reduce life-expectancy, lower productivity, require substantial expenditures for health and other services, and ravage family and community life. These effects (which are described in detail in other publications of the World Health Organization) are experienced, in many nations, by the nation as a whole. Often, they interfere with attainment of important national goals.

But it is also true that national actions affect the development of alcohol-related problems. In every country, government influences the production, trade, and distribution of alcoholic beverages in a manner which affects their price, the conditions under which they are available, and public attitudes towards their consumption. These, in turn, influence the nature and level of alcohol-related problems experienced within the country. That such influence is generally unintended makes it no less powerful.

Other governmental actions (for example, with regard to drinking and driving, alcohol-related violence, provision of health care, and alcohol-related accidents in the workplace) define for a nation the limits of "acceptable" alcohol-related damage. And the efforts of families, communities, non-governmental organizations and other levels of government to prevent alcohol-related problems are profoundly affected (either constrained or supported) by actions at the national level.

These matters have long been of concern to WHO. In 1979, for example, the World Health Assembly affirmed that problems related to alcohol, and particularly to its excessive consumption, rank among the world's major public health problems. The Assembly also noted the serious social and economic consequences of alcohol problems.

In 1982, the Assembly convened Technical Discussions on alcohol consumption and alcohol-related problems in which delegates from more than a hundred countries participated. These discussions were marked by a high degree of consensus on the need for national programmes and policies to prevent alcohol-related problems, including the alcohol dependence syndrome. Delegates expressed keen interest in learning from each others' experiences in this area and appealed for sound data on which to base national decisions, especially information about the relative effectiveness of different prevention and treatment strategies.

In 1983, the Assembly observed that rising alcohol consumption and alcohol-related problems are incompatible with achieving the goal of the Member States of the World Health Organization: health for all by the year 2000. Taking note of the Technical Discussions, the Assembly recommended that Member States formulate comprehensive national policies, with prevention of alcohol-related problems as a priority, within the framework of their strategies for health for all.

In keeping with the expressed concerns and priorities of the World Health Assembly, WHO supports Member States in their efforts to reach decisions on prevention of alcohol-related problems which are consistent with their national needs and circumstances. In recent years, for example, it has conducted a series of studies and workshops relating to development of national alcohol policy. These efforts have been carried out at headquarters and regional levels, with collaborating governments and research institutions, and have produced a valuable body of reports and publications.

This document summarizes current scientific knowledge regarding the effectiveness of various policy measures which governments can take to prevent alcohol-related problems. It is drawn from the documented experience of Member States, primarily as reflected in scientific and professional publications over the last fifteen years. So far as possible, examples of preventive measures have been drawn from both developing and developed countries. It is apparent, however, that more documented evidence exists in some developed countries than elsewhere in the world. It is hoped that one effect of issuing this document will be to encourage others, particularly developing countries, to make available the fruits of their experience in seeking to prevent alcohol-related problems.

The main purposes of the document are, however, much wider. It is hoped that it will help inform the political debate about prevention of alcohol-related problems; that it will support Member States in their efforts to develop effective national policies; that it will encourage careful evaluation (and wide dissemination) of the results of future policy decisions; and that it will confirm Member States in their expressed desire to learn from one another's experiences in this important area of public health policy. Accordingly, it is addressed to scientists, policy-makers (both politicians and civil servants), and individuals and organizations seeking to influence national policy decisions.

1.2 Defining the objectives of national policy

Member States wishing to prevent alcohol-related problems will want to establish clear national objectives. Among the relevant objectives are the following:

(a) Reduce per capita consumption of alcohol

Evidence is now persuasive that, in many of the forms they take, across many cultures, alcohol-related problems tend to increase as per capita consumption increases and to decrease as per capita consumption declines.

(b) Encourage changes in patterns of consumption which involve particularly high risks for drinkers and/or others

Many alcohol-related problems occur when alcohol is consumed at times or under circumstances or in combination with other activities which make it riskier than it would otherwise be to consume a given amount - for example, before driving, during pregnancy, in combination with other drugs, or if one's family has a history of alcohol dependence. Other alcohol-related problems are associated with long-term heavy consumption of alcohol. And some occur when large quantities of alcohol are consumed in a brief period of time.

(c) Reduce the risk of specific alcohol-related problems when drinking and drunkenness do occur

Alcohol-related problems may be sharply reduced but they will never be eliminated, even by vigorous efforts to reduce per capita consumption and change high-risk drinking patterns. So measures to reduce the risk of harm both to and from persons who drink too much (for example, from alcohol-related violence or accidents in employment settings) will always be relevant.

The particular policy measures adopted in pursuit of these objectives will depend on many factors - among them, culture, history, available resources, and political opportunity. But the objectives themselves are pertinent across many cultures and there is now a body of experience which indicates they can be achieved (see part 2 of this document).

1.3 Considerations relevant to national policy

It is clear that Member States wishing to prevent alcohol-related problems face many difficulties - among them, diffusion of relevant governmental authorities, opposition of economic interests, and uncertain public support. These considerations are relevant in both developed and developing countries. In addition, policy-makers are often skeptical that alcohol-related problems can, in fact, be prevented.

1.3.1 Economic factors

In most countries, employment, output, imports, exports, and tax revenues from the alcohol industry are small in relation to national aggregates and, in many cases, decreasing. However, the amounts involved are generally substantial in absolute terms; in addition, the industry may be "of great importance in pockets within individual countries" (Makela et al., 1981a, p.38) and revenue from alcohol taxes is still a relatively large share of total tax revenue in some developing countries.

Perhaps more significantly, the number and diversity of interests whose livelihood is in some way related to production and distribution of alcoholic beverages is also substantial. These include: brewers, distillers, wine producers; importers and distributors of foreign alcohol products; retailers (both for on-premise and off-premise consumption); producers of wheat, barley, corn, grapes, hops; bottlers and packagers; transporters; advertising agencies; the tourism industry; and commercial mass media "in the degree to which they are supported by alcohol advertising" (ARF, 1981, p.197). The service industries are relatively labour-intensive and distribution of alcoholic beverages affects their marginal profitability. And the government itself sometimes owns production firms in whole or in part. "Thus, ... (the) full economic significance [of production and distribution of alcoholic beverages] cannot be gauged from its small share in the main economic aggregates. More generally, to those whose livelihood is derived from producing, importing, or selling alcohol, it is of vital importance ..." (Mäkelä et al., 1981a, p.38).

In a number of countries, the alcoholic beverage industry has participated vigorously in national efforts to reduce alcohol-related motor vehicle accidents. In some countries, it encourages and supports retailers in their efforts to comply with laws prohibiting the sale of alcoholic beverages to persons under the specified minimum drinking age. Not infrequently, it develops, supports, and conducts education programmes for schoolchildren and the general public¹.

However, policy-makers should anticipate that producers of alcoholic beverages, the retail networks, auxiliary industries, the tourism industry, and persons employed in any of these sectors, will generally oppose efforts to increase the price of alcoholic beverages, increase the minimum legal drinking age, restrict hours of sale and/or other conditions of availability, require warning labels, limit production or trade, reduce tax incentives for production and marketing, or restrict advertising or marketing practices. Such measures are often opposed on the following grounds:

- There are economic benefits to alcohol consumption which should be weighed against the costs.
- Reducing alcohol consumption will lead to a loss of income (both wages and profits) for those who produce and distribute alcoholic beverages.

The economic significance of the alcoholic beverage industry is clearly a central factor in development of national policies on alcohol-related problems. Nonetheless, these arguments can be refuted on a number of points.

First, with regard to the economic costs and benefits of alcohol consumption:

- "Certain key costs and benefits are not quantifiable"; others cannot be quantified with any reasonable degree of accuracy (Single, p.102).
- In any case, what is "cost" and what "benefit"? From one perspective, employment and income from the production and distribution of alcoholic beverages are benefits of alcohol consumption; from another, they are costs to the economy "because they involve resources which, in the long run, could be otherwise employed" (Single, p.102). The difficulty extends even to classifying premature death due to alcohol use. "From a social and moral point of view, such deaths are clearly undesirable, but from a strictly economic point of view, they benefit the economy by relieving society of the need to pay for pensions or health expenses in old age" (Single, p.102).

¹ Unfortunately, these programmes do not always point out that many physical, mental, and social problems associated with alcohol consumption are not necessarily related to alcohol dependence (which, though widespread, is only a small part of the total of alcohol-related problems).

- For policy-making, the relevant question is not the total costs and benefits of alcohol consumption but, rather, the costs and benefits of a particular increase or decrease in consumption (Single, p.101).

Second, with regard to the potential loss of wages and profits if alcohol consumption is reduced:

- "It is unlikely that consumers who reduce their alcohol consumption save the money previously spent on alcohol. It is more likely that they simply buy other commodities. Whether this results in a net increase or decrease in the overall number of jobs ... depends on the labour intensity of production and the import share of the different commodities affected" (Leu, p.26). Very simply, jobs lost from a particular industry are not necessarily lost to the national economy.
- The income received by owners of resources which produce alcoholic beverages has "exceeded the amount required to ensure that [these] resources ... were not transferred to some other activity... The abolition of this [surplus] entails no costs to society, whatever its political significance" (Walsh, 1983, p.176).

These arguments clearly assume "that resources can be switched from one line of production to another without serious adjustment costs" (Walsh, 1983, p.176). Where this is not realistic, governments may choose to create incentives or promote alternative uses for such resources.

In some countries, regional trade agreements are also an important factor. Such agreements generally abolish customs tariffs and quotas from the trade between member countries. Sometimes, to further reduce discrimination against imported goods, they attempt to harmonize national tax structures and levels; they may also attempt to organize the market for particular commodities. Removal of obstacles to trade, in alcohol as in other commodities, encourages international trade, "increases international competition and in some cases leads to price reductions" (Sulkunen, p.127). It can also limit the ability of national governments to prevent alcohol-related problems.

Clearly, "free trade as such is not an inducement to increased alcohol use, as its only purpose and function is to set competing products on equal terms in national and international markets". However, "where the introduction of new types of drink is an essential element in the growth of overall consumption, free trade is one of the factors that contribute to this growth, or at least do not hinder it" (Sulkunen, p.125). For example:

In the European Community, recent efforts to reduce the surplus of wine aim to reduce the total volume of wine production in the long run while increasing consumption of wine "in countries where it traditionally has been low" (Kortteinen, 1984a, p.22). The Community's action programme for the wine sector states that "sacrifices and financial burdens imposed on the production regions, particularly in the form of a considerable reduction in the areas planted, should be offset by a substantial increase in consumption, especially in those regions where it is kept down by the taxation on wine" (EEC Commission, 1978, p.10). The wine surplus is at least partly due to Community policies which guarantee price levels and support technological improvements leading to greater productivity (Sulkunen; Kortteinen, 1984b).

In 1978, the United Kingdom was "accused of 'overtaxing' wine relative to beer and thereby affording protection to domestic production of beer" (Maynard and O'Brien, p.239). At that time, the ratio of tax on wine to tax on beer was 5:1. In 1980, the European Court of Justice decided that the two beverages are "to some extent substitutable" (EEC Commission, 1980, p.43) and upheld the European Commission's view that the "proper taxation relationship between wine and beer should be based on alcoholic strength by volume" (EEC Commission, 1980, p.43). In 1983, the United Kingdom was ordered to reduce its wine/beer tax ratio. The Court order did not preclude achieving a lower ratio by increasing the tax on beer and leaving the tax on wine unchanged. Since 1978, however, the United Kingdom has been decreasing the ratio by "successively smaller proportionate rises in wine tax to beer tax. The ratio ... had fallen to 3:1 by 1984" (Powell, unpublished paper, p.49). The effects of this action on total alcohol consumption and alcohol-related problems are not yet known.

Of course, bilateral trade agreements can also constrain national efforts to prevent alcohol-related problems. For example:

In Norway, "an attempt to prohibit alcohol advertising was subject to a renegotiation of bilateral trade agreements conferring product-promotion rights upon the exporter" (Bruun et al., p.86).

It should also be noted that, trade agreements aside, countries generally have limited scope for alcohol tax policies radically different from those of their near neighbours because of the potential for smuggling.

Under such circumstances, the assertion of national interests in prevention of alcohol-related problems is very difficult. Nonetheless, in view of the magnitude of these problems, many countries will want to argue that national public health objectives be considered in the development of regional trade policy.

The Treaty of Rome offers members of the European Economic Community some formal basis for such arguments. Article 36 of the Treaty states that Articles 30-34 (prohibiting quantitative restrictions on imports and exports and all measures having equivalent effect) do not preclude prohibitions or restrictions "justified on the grounds of ... protection of health and life" provided these do not "constitute a means of arbitrary discrimination or a disguised restriction on trade" (European Communities, 1973, p.204; see also Chatterjee).

The Australia-New Zealand Closer Economic Relations Trade Agreement (Article 18) contains similar language.

In the European Economic Community, there has also been recent discussion of the possibility of developing a European health policy and a mechanism for cooperation in health matters has been suggested (European Communities, 1984).

1.3.2 Special considerations in developing countries

(a) Many developing countries are experiencing rapid cultural, social, and economic change. Such changes not infrequently "dismantle natural defences" against alcohol-related problems (among them, traditional cultural values and the influence of family and community) and offer "new economic stimulus" for drinking (Edwards, p.9).

(b) Sudden, large increases in the availability of alcoholic beverages can significantly increase both alcohol consumption and alcohol-related problems (Mäkelä et al., 1981b). Moreover, total consumption of alcohol, even if previously stable, can increase sharply with the introduction of major new types of alcoholic beverages (Walsh & Grant, p.26).

(c) In some developing countries, per capita consumption of alcohol (though low in comparison with developed countries) has been growing very rapidly (much more rapidly than in most developed countries). (Walsh & Grant, p.26).

(d) Alcohol-related problems manifest themselves differently in different cultures (in part, because drinking practices differ) and at different stages of socio-economic development. Nonetheless, in many of the forms they take, across many cultures, they tend to increase as per capita consumption of alcohol increases. In many developing countries, the general outlines of such problems are already apparent. For example:

In Swaziland, "... our outpatient departments are filled on Monday by victims of weekend drinking, our wards are filled with cases of cirrhosis of the liver, haemorrhaging gastric varicosities, ataxias and peripheral neuritides ... We also know the loss to industry and the civil service of young middle-aged men who drop out because of addiction. The mental hospital figures of psychoses directly due to alcoholism are fairly constant, at 20 to 25% of admissions ... The figures from the High Court ... are also striking. Of the 97 cases of murder or culpable homicide heard during 1978 and during 1979 till November, drink played an important role in 58, that is, about 60%. Drunken driving cases are frequent in the subordinate courts and are assuming alarming proportions." (Reinhold).

(e) The "long gestation of many of the chronic physiological consequences of drinking does not make these problems less important to developing countries; even where overall life expectancy is low, the life expectancy of those who survive to 'drinking age' is quite high" (Room, unpublished draft, p.26). Thus, developing countries in which per capita consumption of alcohol has increased greatly over the last 20 years - and whose experience of alcohol-related problems to date may have consisted largely of traffic accidents, accidents in the workplace, violence, and malnutrition of children - can anticipate, in addition, a "substantial 'epidemic'" of the long-term physiological consequences of alcohol consumption in the near future (Room, unpublished draft, p.26). The additional strain on scarce economic and social resources will be considerable and, in the absence of vigorous efforts to prevent alcohol-related problems, will continue to grow.

(f) The market for alcoholic beverages in many developed countries is contracting, even as the capacity of the alcoholic beverage industry expands. Thus, it is likely that producers of alcoholic beverages "will intensify their investment and marketing efforts in developing countries in an attempt to win new customers" (Mäkelä et al., 1981a, p.107). Such investment takes a variety of forms - among them, direct ownership, joint ownership, licensing and technical assistance agreements, and the provision of "expertise in the transformation of distribution and marketing strategies" (Room, unpublished draft, pp.18 and 19).

(g) Many developing countries are themselves eager to encourage the growth of domestic alcohol industries. Brewing, in particular, can seem an attractive proposition in the early phases of industrialization. The technology is relatively simple, the required capital investment is not large, it uses agricultural inputs, it provides a base for other industries (for example, glass and packaging). It also "serve(s) as a source of state revenue and obviate(s) the use of foreign exchange for imported beverages" (Room, unpublished draft, p.17). Furthermore, "the lessons learned and the profits earned ... could play a seminal role in fostering other industrial sectors" (Walsh, 1985, p.43). Manufacture and bottling of distilled spirits is thought to serve some of the same purposes. And the returns can be substantial. For example:

In Zambia, between 1969 and 1980, recurrent revenue to the government from the alcohol industry increased more than five-fold (as a result of annual increases in the price of alcoholic beverages) while total recurrent revenue to the government less than doubled. By 1980, revenue from the alcohol industry comprised 15% of total government recurrent revenue (up from about 5% in 1969, having peaked at about 19% in 1979). In 1979-1980, the turnover of the Breweries Division comprised an estimated 41% of the total turnover of the Industrial Development Corporation of Zambia, Ltd. (up from 23% in 1970-1971). Employment in the Breweries Division is nearly one-quarter of total employment of the companies owned by this government holding company, which produces more than half of the manufactured output of the nation (Serpell).

In 1981, "the total contribution of revenue from alcohol to the government of Western Samoa was approximately WS\$2.5 million... This is 6.8% of government revenue. The contribution of the Western Samoa Brewery to the government in 1981 in the form of excise duty, other duties and taxes (including those paid by the employees of the brewery) was WS\$1,201,642. In addition an 8% dividend was paid to shareholders of Western Samoa Brewery and the government owned 55% of the shares. The contribution from Western Samoa Brewery is expected to increase dramatically in 1984 (by WS\$7-800,000) when the five year income tax and duty concessions come to an end. Operating profits for the brewery in 1980 were WS\$195,547 and in 1981 were \$254,195" (Casswell & Smythe, p.25).

(h) Retailing of alcoholic beverages also offers attractive investment opportunities. For example:

In Botswana, "10% of the medium-sized loans made by the National Development Bank are for bottle stores and bars" (Report of a Meeting on Community and National Response to Alcohol-Related Problems, 16-21 November 1981, Lusaka, Zambia, Part II, p.5).

In Fiji, "the importance of alcohol sales is indicated by the large percentage of profits and total sales made up from alcohol, 60-80% in some supermarkets. The government-owned hotel in Tonga received 30% of its income from bar sales" (Casswell & Smythe, p.9).

In Papua New Guinea, the number of licensed premises in the country more than tripled between 1973 and 1980 (Marshall, p.25). A "dramatic" increase in the number of licensed premises in a province often followed "in the space of only one or two years" the assumption of liquor licensing functions by the provincial government (Marshall, p.19).

In Zimbabwe, in 1983 alone, the number of liquor licenses issued increased "nearly 50% for Harare District and 20% and over in 13 other districts. In one district only ... was the increase under 10%" (Zimbabwe, p.13). "Liquor licenses are only issued for clear beer and not for traditional opaque beers: they are renewed on an annual basis" (Zimbabwe, p.12).

The cash generated by the brewing and selling of beer can be important to the economies of small rural communities, as well. For example:

In Botswana, it has been estimated that "20-30% of rural households may engage in beer brewing" (Botswana, p.2, citing Arntzen).

And, in some African countries, the brewing of beer and holding of beer parties offers women the opportunity for self-employment.

(i) The needs of developing countries are compelling and their resources painfully inadequate. So the prospect of employment, production, and tax revenue from a stable, profitable industry such as production and distribution of alcoholic beverages is understandably appealing. Unfortunately, this potential is attended by the risk of sharp increases in a wide range of alcohol-related health and social problems which will undermine social and economic development and consume national resources.

(j) Domestic production of alcoholic beverages, whether commercial or non-commercial, requires agricultural products and water, which in many developing countries are in very short supply. Such countries will want to consider the implications for nutrition and health status of devoting scarce agricultural land, foodstuffs, and water to the production of alcoholic beverages. For example:

In India, "the moral question of wastefulness with foodstuffs has played a large part when alcohol has been debated publicly ... To use the inadequate production of cereals and other foodstuffs for the manufacture of alcoholic beverages is regarded as a mark of civic irresponsibility" (Armyr et al., p.163).

(k) There is recent evidence that developing countries "have become more and more dependent on the industrialized countries for supplies of raw material for brewing" (Kortteinen, unpublished). This varies from country to country, of course, but "imports of barley and malt by the developing countries as a whole have increased significantly during the past 20 years in proportion to the amount of barley and malt ... required to meet the needs of local brewing industries" (Kortteinen, unpublished).

(l) Undernourished persons may be more vulnerable to alcohol-related problems than those with an adequate diet; this may reinforce the harmful effects of alcohol consumption in developing countries in which malnutrition is prevalent (WHO Expert Committee, 1980, p.23).

(m) Fermented beverages, traditionally prepared, can be a source of nutrients. Indeed, "(s)ome crude fermented beverages or gruels make important direct nutrient contributions" to diet (varying, of course, with the materials from which they are prepared) (Darby, p.72). Commercially prepared alcoholic beverages do not offer similar nutritional benefits. Unfortunately, this is not always realized.

(n) Home-distilled spirits, whether legal or illegal, can be highly toxic. In some developing countries, illness and death associated with consumption of such beverages are considered significant problems calling for governmental action. Occasionally, increasing the availability of commercially produced alcoholic beverages is seen (or presented) as a way of reducing such problems. Governments contemplating this approach should note there are more direct (and very probably more effective) ways of achieving the objective which do not risk the development of additional and more widespread alcohol-related problems.

(o) Scientific evidence regarding the effectiveness of some measures to prevent alcohol-related problems is limited to a very few countries - most of them developed. So it may not be entirely relevant to developing countries (and/or to particular national conditions) and, in any case, may be viewed as irrelevant. For these reasons, policy-makers may wish (1) to test different approaches to the same problem (for example, alcohol-related traffic accidents) to determine if there are significant differences in effectiveness under particular national conditions, and (2) to illustrate the relevance of a particular measure (for example, closing off-premise outlets for the sale of alcoholic beverages one day a week in order to reduce alcohol-related violence) by implementing it briefly in one or two locations.

(p) In developing as well as developed countries, measures which affect the price, production, distribution and sale of alcoholic beverages can be difficult to enforce. For example:

In Mexico, a "law prohibiting the opening of liquor stores near industrial parks, health facilities, or schools has been rendered moot by the explosive growth of Mexico City and the proliferation of these facilities" (Medina-Mora, p.255).

"In most Caribbean countries, there is a legal age limit, but children walk into supermarkets and buy alcohol without being questioned" (Beaubrun, 1982, p.250).

In "many developing countries ..., centralized price policies have little bearing on the considerable non-commercial production of alcoholic beverages" (Mäkelä et al., 1981a, p.94).

Because they are generally enforced not by penalties against individual consumers "but by economic sanctions against a much smaller and more manageable population of business enterprises" such measures are "inherently ... cheaper and more effectively administered" than "strategies such as criminalization and treatment" (Room, 1984, p.305). On the other hand, those affected by such controls are "often better organized and positioned than ... individual citizens or consumers" (Room, 1984, p.311) to protect their own interest. These complexities argue not only for care in selecting prevention measures but also for attention to communicating their benefits, so that public and political commitment is sufficient to secure adequate levels of compliance.

In some cases, it may be possible to develop commitment for enforcement of existing laws and regulations which can reduce alcohol-related problems. For example:

In England, in 1978, police in a seaside resort town tested a new way of supervising licensed premises during the summer months. "The policing of the resort in the summer months had previously been undertaken by ensuring the presence of additional police officers whose prime concern was to deal with outbreaks of public disorder as they occurred." In May 1978, police "visited all licensed premises in the harbourside area considered to be potential sources of, or targets for, public disorder. In every case the licensee was told that for the forthcoming summer the police intended to pay regular and frequent visits to the premises during permitted opening hours ... The licensees were reminded of their responsibilities under the licensing legislation and full co-operation in facilitating the observance of the law was agreed between the licensees and the police.

"The promised attention then occurred throughout the summer months. Visits were normally made by two or three officers in uniform who very visibly entered licensed premises, spoke to bar staff and conspicuously checked for under-age drinking or the

presence of persons the worse for drink. The occurrence of these visits was not such as to provide a regular routine, and varied from premises to premises, but most were visited at least two or three times per week. It was deemed important right at the outset that such visits should be conducted in an amicable manner, and that each time a word or two was passed with bar staff. Another feature of the visits was the thoroughness with which the premises were checked for transgressions of the law. This was to bring home to bar staff and patrons that good orderly conduct was essential ...".

In 1978, the year of the altered policing practice, all arrests in the resort town decreased by 20.9%; they rose by 20.3% in 1979. "(T)he figures for the control town [in the same tourist region] do not reveal a similar fluctuation, with the first two years under investigation remaining constant and then rising by 25.7 per cent in 1979. ... (T)here was a significant drop in the number of arrests between the towns ... and it is possible to suggest that this was due to the alteration in police practice ...".

In addition, "alcohol related crimes [i.e., those for which over 80% of persons arrested admitted to taking alcohol in the four hours prior to their offence] decreased to a significantly greater degree than did non-alcohol related crimes ... (A) similar analysis for the control town showed no such variation ...".

It should be noted as well that "the recorded crime figures (i.e. reports of the occurrence of crime by the public to the police) also show a substantial drop in the experimental town in 1978, down 15.7 per cent ..., whereas in the control town, recorded offences fell ... only 7.3 per cent. Although this is not statistically significant ... the trend supports the view that the significant fall in arrests between the towns was not the result of less efficient policing, but due instead to a fall in the commission of arrestable offences" (Jefferies & Saunders).

(q) In many developing countries, it is possible to identify traditional cultural, religious, and social norms which will support efforts to prevent alcohol-related problems. Recognition that alcohol-related problems interfere with desired social and economic development can also encourage public support.

(r) In developing as well as developed countries, the possibilities for effective community action to prevent alcohol-related problems, independent of measures taken by government, should not be overlooked. For example:

In Honduras, in the barrio of Santa Eduvigis, "by a community decision, the local food store no longer sells alcohol. [Santa Eduvigis, a barrio of 60 houses and 300 people, is located in a district of high unemployment and low wages marked by family instability, violence, and alcoholism]. Although alcohol is still readily available from nearby outlets, the insistence that it should not be sold locally reflects a change in community values [which evolved in the course of its participation in a mental health/community development project initiated in 1975] that has been accompanied by a decrease in the frequency and severity of alcohol-related problems" (World Health Organization, 1984, p.27).

In the State of Alaska, in the Eskimo village of Napaskiak, where "travel and fishing on the river are a very important part of daily life ... (t)he combination of drunkenness and river travel in canoes had resulted in a number of drownings and near-drownings. A group of 5 village men, ranging in age from 18 to 83, set up a river patrol to patrol the village's stretch of the river and watch for drunken people in canoes. Using a borrowed motorboat, they would tow the canoe to the centre

of the village and hold the canoe until its occupants were sober. Since this was seen as a shameful occurrence, in a culture where it is important to avoid being shamed, the procedure was quite effective in reducing the number of drunken people in canoes ..." (Room, unpublished draft, p.39).

In fact, "in any community there are ... likely to be a host of small, sensible and acceptable measures that can usefully be proposed in the light of sensitive local knowledge" (Edwards, p.33). For example, "it may be a local community decision to press for stricter licensing provisions, to curtail the sale of drink to young people, to plan for other leisure activities more family-based than bar or tavern. The individual factory may wish to instigate its own preventive policy: rules for instance about sobriety at work (and its enforcement), 'dry' canteens, and cheap alcohol not seen as a bonus for managerial status." In these and many other ways, a community can "properly and caringly" look after its own health (Edwards, p.33).

2. REVIEW OF EVIDENCE ON THE EFFECTIVENESS OF NATIONAL POLICY MEASURES

Many measures which might prevent alcohol-related problems have never been systematically evaluated. And current knowledge is insufficient to permit detailed advice on a great many technical points important to the development of effective national policies. But the scientific evidence summarized here does support two confident - and hopeful - conclusions:

- Alcohol-related problems can be prevented.
- They can be prevented by measures which governments can take.

In fact, history offers ample evidence that alcohol-related problems not only rise but also fall, often very rapidly. Such changes have occurred in both developing and developed countries, in many historical periods. In recent times, national trends in alcohol-related problems have been largely upward. However, there are also clear recent instances in which they have been halted or even reversed. For example:

In France, between 1956 and 1982, per capita consumption of alcohol declined nearly 27%: from more than 26 litres of ethanol per person aged 15 years or more to just over 19 litres. And decreases in significant alcohol-related health problems have followed. Between 1975 and 1982, the death rate from cirrhosis of the liver declined 21% for both men and women. Between 1960 and 1982, the death rate from alcoholism/alcoholic psychosis declined 43% for men, 53% for women. Between 1970 and 1980, first admissions to public psychiatric hospitals for alcoholic psychosis/chronic alcoholism declined slightly.

In Sweden, between 1979 and 1982, there was a statistically significant decline in liver cirrhosis as an underlying (primary) cause of death: 28% for men, 29% for women. There was also a statistically significant decline in mortality from liver cirrhosis with alcoholism as an underlying cause (though none from liver cirrhosis as a contributory cause of death). "The decrease in mortality from cirrhosis of the liver affected people of most ages and contributed to a general reduction in mortality among adults" (Romelsjö & Agren, p.168). Between 1979 and 1982, there was also a statistically significant decline in the death rate from pancreatitis for both sexes: 30% for men, 36% for women. The death rate from alcoholic psychosis/alcoholism/alcohol intoxication has fluctuated. Most of these reductions began three years after the start of a decline in sales of alcoholic beverages: sales declined 17% between 1976 and 1982 (to about 6.4 litres of ethanol per person aged 15 years or more). Though there may have been some increase in home production of alcohol (both licit and illicit) over this period, "the general opinion by Swedish experts", supported by survey data on alcohol consumption habits, is that there has been a decrease in consumption (Romelsjö & Agren, p.167).

2.1 Measures for which there is reasonably good evidence of effectiveness

2.1.1 Increasing the relative price of alcoholic beverages

The sum of scientific evidence and historical experience affirms that, other factors being constant, an increase in the price of alcoholic beverages relative to other commodities generally reduces per capita consumption (ARF, 1981, p.162; Bruun et al., p.74; Davies, p.156; Moore, p.69; Smart, p.235).

More recently, there is also explicit evidence that the price of alcohol, acting through its effects on consumption, influences the level of alcohol-related problems. For example:

In Trinidad and Tobago, between 1966 and 1975, the number of road traffic accidents per year "rose and fell predictably ... with changes in the price of rum relative to per capita income" (Kendell et al., p.366, citing Beaubrun, 1977).

In the United States, between 1960 and 1974, there were 38 instances (in a sample of 30 States) in which State taxes on distilled spirits were increased by more than \$0.24 per proof gallon. Although the resulting price changes were of "relatively small magnitude", 63% of the tax increases were followed by a greater reduction (or smaller increase) in cirrhosis mortality than occurred in the median State in the corresponding year; 66% were followed by a greater reduction (or smaller increase) in automobile accidents than the median (Cook; see also Cook & Tauchen, 1982).

In Scotland, in 1981, a combination of tax and price increases caused the price of alcoholic beverages to increase faster than the retail price index and average disposable income. Unemployment rose simultaneously. Surveys of "regular drinkers" conducted in Edinburgh and the surrounding area in 1978-79 and again in 1981-82 indicate that, between surveys, total alcohol consumption fell by 18% and associated adverse effects by 16%. Although rising unemployment was responsible for up to one-fifth of the reduction in consumption, "the increased price of alcohol was the major influence. Heavy drinkers and dependent drinkers both reduced their consumption at least as much as light or moderate drinkers and suffered fewer adverse effects as a result." During the three-year period, the retail price index rose by 52%, the cost of all alcoholic beverages by 61%, and the cost of beer alone by 69%; average weekly earnings in the Edinburgh region and average personal disposable income in Scotland both rose more than the retail price index (Kendell et al.).

The degree to which consumption will decline in response to an increase in the price of alcoholic beverages (whether this is accomplished by taxation or, as in some countries, by direct pricing) will vary from one country to another and, within a country, over time, depending on social, cultural, and economic circumstances (Ornstein & Levy, p.331). Among the factors influencing this response are:

- the magnitude of the price increase;
- the relative prices of different alcoholic beverages;
- changes in disposable income (which may offset or reinforce the effects of price increases);
- the extent to which alcoholic beverages are available from legal home production, illegal production, and/or smuggling (subject, of course, to other governmental measures to prevent undesired side-effects); and
- the interaction of price with other influences on the availability of alcoholic beverages (for example, the type, location, and frequency of sales outlets or the days and hours when sale is permitted).

Consumption of the "most popular" type of alcoholic beverage in a particular country is generally thought to be more resistant to increases in price than is consumption of other alcoholic beverages (Maynard & Kennan, p.345; Duffy makes a similar point).

Increasing the price of alcoholic beverages may deprive the families of some drinkers who are poor. However, there is little reason to believe that poor drinkers are less likely than other drinkers to reduce their alcohol consumption in response to price increases. And, to the extent that consumption does decline in response to higher prices, both family income and the health of the drinker may improve (Moore, p.73).

In sum, increasing the price of alcoholic beverages relative to other commodities can be expected to reduce consumption (by heavy drinkers as well as others in the drinking population), and, thus, to prevent alcohol-related problems.

Studies of the impact on smokers of raising tobacco taxes suggest that increasing the relative price of alcoholic beverages might discourage young persons from starting to drink (Lewit & Coate; Lewit et al.). In addition, preliminary results of a recent study of the effects of the price of alcohol on consumption by young people indicate that higher prices reduce not only the number who drink but also the incidence of heavy drinking and of frequent drinking (Grossman et al.).

Of course, depending on their magnitude, price increases may be less effective in preventing alcohol-related problems when disposable income is rising than when it is steady or falling; however, even when income is rising, increasing the relative price of alcoholic beverages may restrain increases in alcohol-related problems which would otherwise occur.

It must be noted that higher taxes on alcoholic beverages can increase tax revenues to the State even while lowering total consumption (Walsh, p.184; Levy & Sheflin, p.936). Nonetheless, many governments have been reluctant to use alcohol taxes as a source of additional revenue. Among the reasons for this reluctance:

- Alcohol taxes are generally excise (rather than sales or ad valorem) taxes and, so, must be adjusted by "separate and politically visible decisions" (Mäkelä et al., 1981a, p.77).
- The price of alcohol is often included in national cost-of-living indices which guide or bind national decisions on wage levels (though it may have a smaller impact as consumption of alcohol declines in response to price increases).

It should also be noted that national tax policy can affect the price of alcoholic beverages in a variety of other ways - for example, by rules regarding depreciation of capital investment, tax credits for investments, allowable "business expenses", and other matters which can raise or lower the costs of production, marketing, and distribution (Mosher).

2.1.2 Sharp restrictions on the distribution of alcoholic beverages

Sharp restrictions on the distribution of alcoholic beverages (as illustrated by periods of rationing, prohibition, and strikes in the distribution system) significantly reduce alcohol-related problems. For example:

In Canada, Finland and the United States during the first few years of prohibition, with the exception of automobile accidents, "all indicators of alcohol consumption and alcohol problems reached the lowest level yet achieved in any period for which there are relevant data" (Bruun et al., p.69). It is estimated that, in the United States, total alcohol consumption declined sharply during the early years of prohibition, then rose somewhat toward the end of the 1920s (Aaron & Musto, p.164).

In France, "stringent" rationing of wine between 1942 and 1948 was followed by a dramatic decline in the cirrhosis mortality rate in Paris (from 35 per 100 000 in 1941 to 6 per 100 000 in 1945 and 1946). When wine rationing was repealed in 1948, the cirrhosis mortality rate "quickly" returned to its former level (Cook & Tauchen, 1982, p.385, citing Terris).

In Finland, in 1972, a strike closed retail liquor stores for five weeks. "Overall consumption of alcohol decreased by roughly a third" (Mäkelä, p.131), even though "alcoholic beverages were delivered in routine fashion to licensed restaurants, and deliveries of freely sold light [so-called 'medium'] beer to retail shops and licensed establishments continued normally" (Mäkelä, p.132). Home production of alcoholic beverages and consumption of surrogate alcohol also showed "some increase". Nonetheless, during this period, "arrests for drunkenness decreased to about one-half, cases of assault and battery were reduced by some 20 to 25 per cent and cases of drunken driving by between 10 and 15 per cent" (Mäkelä, p.131).

In New Zealand, in 1976, a four-week strike of beer-truck drivers (joined for two weeks by brewery workers) had "a major effect on drunkenness and other alcohol-related offences" (Smart, p.228), even though wine and spirits continued to be available and the beer supply was not entirely cut off.

In Norway, in 1978, a nine-week strike of production, storing, and transport workers at the Norwegian Wine and Spirits Monopoly stopped deliveries of wine and spirits to all retail outlets and licensed premises. However, retail sales of wine and spirits continued until stocks were exhausted and beer was on sale as usual. Sales of beer, imports of wine and spirits, home production of wine, and illegal home distilling all increased during the strike period. The estimated decrease in total alcohol supply was approximately 10-15%; the estimated decrease in total alcohol consumption was 5-10%. Nonetheless, "most measures strongly influenced by skid-row alcoholics, i.e., admission to detoxification centres, the use of detoxification rooms at the so-called protection homes, reports of drunkenness, drunkenness arrests, offences called 'home quarrels', number of drunkards in the street, and injuries caused by falling, showed a marked decrease" (Horverak, p.65).

In Poland, in 1981, the rationing of alcohol "involving a 20% overall drop in consumption, was accompanied by declines of 11% in cirrhosis deaths, 39% in admissions to sobering up stations, and 40% in first hospital admissions for alcoholic psychoses" (Room, 1984, pp.309-310, citing Wald & Moskalewicz).

These decreases occurred during periods of restricted supply ranging in length from a few weeks to several years, following "accidental" restrictions in supply as well as deliberate policy decisions, and despite often considerable opportunity for substitution of alcoholic beverages or evasion of the restrictions.

Moreover, as the examples indicate, it is not simply moderate drinkers whose consumption is influenced by such general changes in the availability of alcoholic beverages. In fact, "it is precisely the heavy drinkers most likely to appear in ... casualty and crime statistics whose behavior often seems most strongly affected" (Room, 1984, p.309; ARF, 1981, p.151 makes similar point).

In addition, historical experience suggests that preventing sudden, large increases in the availability of alcoholic beverages may actually prevent the development of alcohol-related problems. For example:

In Finland, in 1969, thousands of new outlets for medium-strength beers (which had not previously been available) were opened and the number of liquor stores and fully licensed restaurants substantially increased. In addition, minimum age limits were lowered, opening hours extended, restrictions on maximum amounts purchasable loosened, and penalties for public drunkenness reduced. Total per capita consumption increased 46% the year these changes were made (Mäkelä et al., 1981b, p.33); the number of heavy consumers increased proportionately (Smart, p.231). Between 1970 and 1975, total per capita consumption rose an additional 48% (Moser, p.108). And there were large increases in alcohol-related problems. The rate of increase varied, of course, from one problem to another, but it was in many cases substantial. Between 1968 and 1975, for example, the rate of deaths from liver cirrhosis, the rate of deaths from alcohol psychosis, the rate of arrests for drunkenness, and the violent crime rate nearly doubled (calculated from data in Mäkelä et al., 1981b, Table 1, p.38). From 1969 to 1975, hospital admission rates for several alcohol-related

diagnoses also "increased markedly" (Mäkelä et al., 1981b, p.37); these increases do not seem to be explained by changes in the number of hospital beds available, admission policies, or diagnostic practices (Mäkelä et al., 1981b, p.37 citing Poikolainen). In addition, between 1968 and 1976, "the proportion of male drinkers reporting that they had stayed off the job because of alcohol increased from 10% to 18%, and the percentage who had to change jobs because of drinking doubled" (Mäkelä et al., 1981b, p.38). "Unrecorded consumption remained at the same level throughout the period 1950-1975. Contrary to expectations, it was not substituted for by the large increase in recorded consumption" (Mäkelä et al., 1981b, p.35).

These developments were dramatic in their intensity and swiftness and are exceedingly well documented. But they may well be relevant to developing countries in which per capita consumption of alcohol is currently low and factors tending to increase the availability of alcohol (for example, large-scale migration to urban areas and rapid expansion of transportation networks, distribution systems, tourism, and a cash economy) gathering momentum.

Evidence regarding the impact of gradual rather than sudden changes in the availability of alcoholic beverages and of restrictions on distribution less dramatic than those described above is less clear. It is discussed in a later section of this document.

2.1.3 Increasing the minimum legal "drinking age"

Lowering the minimum age at which a person may legally purchase alcoholic beverages (or at which alcoholic beverages may legally be sold to him) frequently increases the rate of automobile accidents among young people (ARF, 1981, p.164; Douglass, p.359; Whitehead, 1980, p.87; Wagenaar, p.30), sometimes including young people not yet of legal "drinking age" (Wagenaar, p.23; Smart, p.236, Cook & Tauchen, 1984, p.171).

Conversely, increasing the minimum legal age generally reduces accident rates among young people (Wagenaar, p.30; Vingilis & De Genova, p.168). For example:

In the United States, eight of nine States which raised their legal minimum "drinking age" experienced a reduction in night-time fatal crash involvement among drivers in the affected age group. The average reduction in the nine States was 28% (Williams et al.).

Not surprisingly, "the magnitude of the estimated impact varies across jurisdictions ... and depends to some extent on the sophistication of the research methods used" (Wagenaar, p.30). Canadian experience suggests that the greater the number of years by which the minimum age is increased (e.g., three years rather than one), the greater the decrease in traffic accidents (Smart, p.240).

Although these findings are limited to Canada and the United States, they are relevant to many countries in which motor bicycles are widely used by the young and/or in which alcohol-related motor vehicle accidents are a major cause of death and injury among young people. They may be relevant also to countries which have very low minimum age requirements or none at all.

In some jurisdictions, the law also prohibits possession or consumption of alcoholic beverages by persons under the prescribed minimum age. It is thought likely that, in the United States, "hardly any marginal effect" derives from these additional prohibitions (Bonnie, p.172); the case may well be different in other countries.

The impact of minimum age laws on alcohol consumption and drinking patterns among young people is, at present, unclear; the scientific literature on these points is "inconsistent ... and has major methodological limitations" (Wagenaar, p.30; Whitehead, 1980, p.85-87, draws similar conclusions).

It should be noted that minimum age requirements are often seen as expressing and communicating society's view of appropriate conduct - and, for that reason, as having important symbolic effects in addition to their demonstrated impact on automobile accident rates.

2.1.4 Increasing the probability of detection and punishment for drinking and driving

Increasing the probability of detection and punishment for drinking and driving reduces deaths and injuries in traffic accidents.

Both the actual probability of detection and punishment and the public's perception of that probability are crucial to sustained effectiveness. The critical elements of action to this end include:

- making driving with a blood alcohol concentration (BAC) higher than a specific level a legal offence in itself;¹
- requiring that BAC be established by chemical tests (for example, of blood, breath, or urine);
- requiring police to test BAC at roadside if a driver is involved in an accident or a traffic violation or permitting police to stop drivers and test for BAC at roadside without any prior evidence of possible drinking; and
- imposing punishment considered "severe and depriving" (Ross, 1981, p.15) for driving with a BAC above the legal limit (for example, mandatory suspension of driver's licence) and applying it also for refusal to submit to the tests.

These conclusions emerge from the cumulative experience of several countries. In particular:

In the United Kingdom, in 1967, the law was amended to define driving with a blood alcohol concentration of 80 mg/100 ml or higher as an offence and to permit police to demand a roadside breath-test (to screen for blood-alcohol concentration) if a driver were involved in an accident or a "moving" violation of traffic law or gave reasonable cause to the police to suspect he had been drinking. "Refusal to take part in the tests was punishable as though the tests had been failed" (Ross, 1984, p.27). (Since 1962, the law had required a year's suspension of driver's license for serious motoring offences, including drinking and driving). Enactment and implementation of the 1967 law were accompanied by substantial controversy and resulting publicity and "road casualties declined impressively" in the months subsequent to its implementation (Ross, 1984, p.28). In particular, fatal and serious injury crashes on weekend nights ("in which alcohol is much more commonly involved ... than at other times") dropped 66% in the first month, "an unprecedented and highly significant decline" (Ross, 1984, p.30). "For the three months following the passage of the act, casualties from traffic accidents were reduced 16% from the same period the previous year, and fatalities were reduced 23%" (Reed, 1981, p.343, citing Ross, 1973, p.20). The percentage of all drivers killed in England and Wales who had illegal blood alcohol concentrations declined from 25% in December 1966 - September 1967, prior to the implementation of the law, to 15% in the corresponding period of 1967-68 (Ross, 1984, p.31). However, these initial effects "dissipated within a few years" (Ross, 1984, p.31). "By 1975, the percentage of drivers killed in England and Wales in road accidents with a BAC level of 0.08% or more had reached 36%, substantially above its pre-1967 level" (Reed, 1981, p.343, citing Comptroller General of US).

1 There is a "clear decrease in driving safety" at a blood alcohol concentration of 0.5 grams per liter (WHO, 1981, p.16). "Above 80 mg% the risk of accident involvement increases appreciably ... beyond 100 mg% all drinking drivers are impaired" (OECD, p.121). Moreover, "addition of any psycho-active substance to even low blood alcohol concentration may result in unexpected and severe degrees of impairment" and "at the low level of 50 mg%, inexperienced drinkers and/or drivers ... are at greater risk than average" (OECD, p.107).

The observed reductions in traffic deaths and injuries were accomplished "without a decline in alcohol consumption, apparently because drinking was being separated from driving" (Ross, 1984, p.33).

Similar measures were subsequently adopted in France, the Netherlands, Canada, and New Zealand - with some impact initially (though less than in the United Kingdom) and a similar decline in effectiveness over time (Ross). The initial effectiveness of these laws has been attributed to "overestimation of the probability of punishment" for drinking and driving, "produced by the publicity and newsworthiness of the new laws" (Ross, 1984, p. 70). The eventual decline of their effectiveness, to drivers "learning through experience" that the actual probability of punishment, even if much increased, was considerably lower than they had originally estimated, in some cases remaining "negligible" (Ross, 1984, p.70).

An earlier experience in Australia demonstrated "no effects", under conditions "unfavourable ... for both effectiveness and scientific analysis" (Ross, 1984, p.57).

The circumstances under which chemical tests for BAC may be administered have varied greatly in countries adopting laws otherwise similar to the British. This appears to explain some of the variation in effectiveness. For example:

In Canada, the drinking-driving law implemented in 1969 had a "moderate but temporary and evanescent effect" (Ross, 1984, p.48, citing others), "less marked and less prolonged than the effect" of the British law (Ross, p.51), and was "in fact as well as perception less threatening" (p.52). Among other reasons: "Police were not empowered to test a motorist's breath merely because he was in an accident or had committed a traffic-law violation, as in the United Kingdom" (p.51) but had to have "reasonable and probable" grounds to believe that a driver was impaired by alcohol before requiring a breath test. The breath test was "quantitative and evidentiary ... not requiring a subsequent blood test, but in practice requiring the use of stationary ... equipment at police stations instead of portable equipment in patrol vehicles, as in the United Kingdom" (Ross, 1984, p.48; OECD makes similar point, p.82).

In general, both the actual probability of detection and punishment and the public's perception of this probability can be expected to benefit from "a simple and fast method of determining BAC and greater powers to the police in detecting the drinking driver" (OECD, p.82) - though these must be used, of course, if they are to have any effect at all.

It is also noted that drinking and driving laws may have had "marginal or temporary" effects because they were "applied half-heartedly" (Snortum, 1984b, p.138, citing Ross). The outcomes of a number of sustained, highly publicized enforcement campaigns - which effectively diminished serious crashes - support this view. For example:

In the United Kingdom, in 1975, the chief of police in the county of Cheshire, "(c)oncerned about the apparent falling off of the drinking-and-driving law's effectiveness, decided to conduct an 'experiment ... to go as far as (he) could within the law to breathalise all people driving between 10 at night and 2 in the morning'. He required that policemen under his authority administer the screening breath tests in the course of all investigations of crashes and of traffic law violations during these night-time hours for one week during July. There resulted 284 breath tests during the 'experimental' period, compared with 31 in the same period of the previous year. Subsequently, 38 drivers were found to have had illegal blood-alcohol concentrations, compared with 13 in the prior year. Although testing in the normal year was proportionately more likely to find positive results, it appeared that numbers of alcohol-influenced drivers had been escaping detection even though involved in law violations or crashes and therefore susceptible to the requirement of breath tests." It was decided to expand the experiment and maintain the effort for most of September. However, the plan became known publicly and there was "vehement protest" - and resulting publicity. The month's effort was conducted nonetheless and "was associated with a diminution in serious crashes" interpreted as the effect of the enforced law (Ross, 1984, p.72). During this period, "the level of

breath testing in the county rose to six times the national average (Ross, 1984, p.73). There was no decrease in crashes in July when the increased enforcement was not publicized.

In Australia, in 1978 and 1979, three periods of "intensified" breath testing "with associated mass publicity" were carried out in selected areas of the capital city of Melbourne on Thursday, Friday and Saturday nights - and the risk of night-time traffic accidents in which at least one person was killed or injured and admitted to the hospital was reduced. More specifically, there was a 24% reduction in such accidents in the areas and periods of testing (relative to changes in day-time accidents of the same type in the same areas and periods). "There was also strong evidence ... that intensified [testing] had residual effects in the areas of operation" for "at least two, but less than four weeks after operations had ceased" and some evidence of reduction in the risk of such accidents "in nearby areas ... to at most four weeks after operations ceased" (Cameron & Strang).

In the United States, between January 1976 and June 1979, a "major enforcement crackdown on drunk drivers" was carried out in the city of Stockton, California. The campaign consisted of "traditional" police efforts "to detect drunk driving through the observation of unusual or unsafe driving"; police did not have authority for roadside breath testing and did not use roadblocks or checkpoints (Voas and Hause, pp.3-4). "Ten extra police officers were assigned to drunk-driving patrol on Friday and Saturday nights, raising the estimated probability of apprehension for a drunk driver to about one chance in 300. This figure, though low in absolute terms, represents more than a tripling of the estimated normal risk in the United States and most other nations ... The evaluation ... found encouraging declines in nighttime crashes ... Control series of daytime crashes and of pooled nighttime data from four comparable California cities did not show this effect. Moreover ... (t)here was a decline in the proportion of alcohol-impaired drivers on weekend nights, from 8.8 percent in a baseline period to 5 percent after the project had been in operation for two years. The evaluation also found evidence that the weekend night patrol, although limited to selected sites, seemed to have affected crashes in the entire city. Moreover, although it was active only on weekends there was a generalization of its effect to weekday nights as well" (Ross, 1984, pp. 117-118, citing Voas & Hause).

In sum, "(t)here is good evidence that if drivers in general perceive a high risk of being arrested if they drive drunk they will be deterred from doing so, and alcohol-related traffic accidents will decrease substantially" (Reed, 1981, p.361). Unfortunately, it is not currently known "what levels of [actual] risk are necessary to achieve various degrees of deterrence and what it would cost to bring about such increases in risk" (Reed, 1982, p.70).

However, assuming that police are permitted to stop drivers and test BACs without any prior evidence of drinking, it is believed possible (Jonah & Wilson, p.477) to increase the impact of enforcement efforts by

- stopping drivers to test BACs during main drinking hours (for example, weekend nights from 21.00 to 04.00) rather than throughout the day and week;
- locating road stops for BAC testing in places where drinking and driving is most likely to occur (for example, on roads with concentrations of taverns and restaurants or which connect drinking locations with residential areas);
- locating road stops for BAC testing so they will be visible to a large number of people;
- keeping the day, time, and location of road stops highly unpredictable; and
- conducting enforcement campaigns of some duration periodically rather than continuously, partly to encourage publicity.

The optimal scheduling of such periodic enforcement efforts will naturally vary over time and with cultural and other factors but can be established empirically (Jonah & Wilson, p.478; Borkenstein, p.6).

Increasing the severity of punishment without also increasing its certainty does not appear to reduce either drinking and driving or traffic accidents. Moreover, it can have "unexpected and undesired" effects on the functioning of the legal system. For example:

In a city in Australia, the imposition of "tough" penalties for drinking and driving by a local magistrate (who obtained some notoriety for his efforts) did not reduce serious crashes discernibly. However, reported crashes decreased, the average value of insurance claims increased (perhaps because small claims were less likely to be made) and proportions of crash-involved drivers charged by the police dropped significantly (Ross, 1984, p.95).

The effects of increasing the speed with which punishment is imposed are not known, partly because such changes are generally associated with changes in certainty and severity of punishment, making it difficult to distinguish effects (Ross, 1981, p.93). Nonetheless, in view of the increased burden on the judicial system likely to result from more rigorous enforcement of drinking and driving laws, it is generally thought advisable to simplify their adjudication as much as possible, for example by

- holding administrative hearings rather than criminal trials for persons who contest the results of a BAC test, and
- imposing penalties automatically if a hearing is not requested or a finding of BAC above the legal limit is sustained by a hearing officer.

"Such a move need not be accompanied by greater leniency; fines and driver's licence suspensions ... could still be issued and even jail sentences need not be excluded" (Jonah & Wilson, p.472). In particular, drinking which causes injury or death can be retained under the criminal code.

Education and rehabilitation programmes of the type sometimes required of persons arrested for drinking and driving "may be beneficial" in reducing future violations of drinking and driving laws (OECD, p.95; Mann et al., p.457) and do offer an opportunity to identify persons in need of treatment for alcohol dependence. However, there is little evidence they reduce future traffic crashes (OECD, pp.95 and 119), especially as compared with "traditional punitive measures" (Reed, 1981, p.361).

A recent review of rehabilitation programmes in the United States concluded that, on the basis of current knowledge, it "appears untenable" to use "legal sanctions, and licence suspensions in particular, as a substitute for, or as a bargaining tool to obtain, participation in a rehabilitation programme ... Legal sanctions appear to have an important positive impact ... which rehabilitation programmes should supplement, not replace" (Mann et al., p 458).

Although, as noted above, extensive publicity is seen as critical to increasing the perceived probability of punishment for drinking and driving, "no study to date has produced any evidence that public education programmes alone reduce traffic accidents or injuries" (Cameron, p.542) (emphasis added). This is generally attributed to the use of inappropriate criteria for effectiveness, weaknesses in research design, and inability to separate the effects of education programmes from the effects of changes in law or enforcement practices which often occur simultaneously (Cameron and OECD).

Nonetheless, there are some indications that long-term public education can influence social norms and values, presumably including those regarding drinking and driving (see section 2.2.1). Indeed, "social consensus" (Snortum, 1984a, p.33) and "habit formation and moral education" (Ross, 1984, pp.68-69, citing Andanaes) are viewed as contributing significantly to the prevention of alcohol-related traffic accidents in Norway and Sweden over the long term.

It should also be noted that increasing the real price of alcoholic beverages (see section 2.1.1) and increasing the minimum legal drinking age (see section 2.1.3) also prevent traffic accidents. And "technological" measures to reduce traffic accidents generally (for example, seat belts and improved roads) are likely to reduce those which are alcohol-related as well.

2.2 Measures widely believed to be effective, though little scientific evidence is currently available

2.2.1 Education of school children and the general public

Neither individual school-based alcohol education programmes nor public education campaigns via the mass media have proved effective in reducing alcohol-related problems - though, in the short-term, they not infrequently increase knowledge and sometimes change attitudes. These findings are generally attributed to methodological weaknesses in evaluations of the programmes and/or in the programmes themselves (for example, failure to define objectives or target groups with sufficient precision).

However, at least for school-based programmes, "(i)t must be kept in mind ... that much of the evidence necessary for a confident conclusion regarding impact does not exist at present" (ARF, 1981, p.136). For example, research to date has only rarely explored the possibility that different types of educational approaches may have different types of effects on different types of children (Braucht & Braucht, p.272).

A few experimental efforts to encourage and support behavioural change in a health-enhancing direction have succeeded in reducing health risks. These programmes had several critical elements in common - among them, the following:

- They attempted to change several types of behaviours associated with adverse health effects.
- They combined mass media campaigns with other measures.
- They were based in and involved the community.

More specifically:

In the United States, a programme to modify behaviours known to contribute to the risk of heart disease was undertaken in three California towns in 1972 (Stanford Heart Disease Prevention Project). "Two towns ... were selected for public health education and a third town served as a control ... (E)ducational campaigns via mass media were started in the two towns. Specifically, the programmes advocated dietary changes (a reduction in animal fats, cholesterol, sugar, alcohol, and salt and an increase in fibre), giving up cigarettes, a return to ideal weight, and a programme of regular exercise. Most of the behaviour changes advocated involved not only motivation to change ... but also the learning of new information, the acquisition of new skills, and the practice of techniques for maintaining these skills ... (M)essages were delivered through a variety of media ... In one town, a group of people found to be at high risk of cardiovascular disease were selected at random to receive an additional 14-week programme of intensive instruction. They received home counselling or took part in group classes ... Surveys and medical examinations were conducted after one, two, and three years of the campaign. As might be expected, those receiving intensive training in addition to the media campaign showed the sharpest initial reduction in risk. By the end of two years, however, the town receiving health messages through the media only had caught up with the community including the intensive instruction group. When overall risk of heart disease was calculated, participants showed reductions of between 16 and 18% after two years. In the town that received no educational campaign, the average risk had increased by 6.5%. There was some retrogression during the third year in the mass-media only town when educational programming was sharply curtailed, but not in the mass-media town that included intensive instruction. Apparently the supplemental value of face-to-face instruction had more staying power" (Moore, pp.94-95, citing Farquhar et al., 1977).

In Finland, a project to modify major lifestyle risk factors leading to coronary heart disease was initiated in North Karelia in 1972 at the initiative of the community itself. The programme focused on reducing the prevalence of smoking, serum cholesterol concentration, and raised blood pressure values. It included public education through a variety of channels, integration of the programme into existing health and social services, creation of new services when necessary, training of health personnel, and environmental changes (such as increasing the availability of low fat food stuffs and introducing restrictions on smoking in certain indoor spaces). Over a five-year period, "the decrease in risk factors was generally greater in North Karelia than in the control county" (Rootman, p.67, citing Puska et al.).

It is not known at present "whether such programmes will have lasting and consistent behavioural effects" (ARF, 1981, p.136) or whether they can be implemented with similar success on a larger scale. But they do encourage hope that alcohol-related problems can be effectively addressed through community-based education directed at a range of health-related behaviours. In addition, they suggest that mass media campaigns on alcohol-related problems might be more successful if they

- "provide explicit instructions for [behavioural] change" (ARF, 1981, p.138);
- are undertaken in combination with other measures; and
- "are sustained over a long period of time" (Rootman, 1985).

For developing countries, these findings (for example, regarding the value of face-to-face instruction) seem to imply an important role for primary health care workers, supported by the mass media, in preventing alcohol-related problems.

The implications of the literature on school-based alcohol education (whether it conveys information about alcohol and alcohol-related problems, teaches decision-making skills or attempts to "clarify values") are less clear. However, teaching and counselling by peers (rather than adults) is thought to increase impact. One recent United States review argues that school programmes should focus on current alcohol problems of young drinkers (for example, traffic accidents, fights, diminished school performance) rather than trying to shape drinking practices over a lifetime (Moore, p.92). This would be consistent with findings that efforts to prevent onset of smoking among young people are "most successful" when they emphasize "social and immediate consequences of smoking rather than long-term health consequences" (USDHHS, 1982, p.300). There have also been promising initial results from experimental efforts to teach children skills for recognizing and resisting "social pressures" toward tobacco, alcohol and drug use (e.g. McAlister et al.; Vartiainen et al.; USDHHS, 1982, pp.296-300; USDHHS, 1984).

The cumulative effect of "forces that alert, motivate, instruct, and maintain changes in public attitudes and practices" (Farquhar et al., p.412) may well be substantial, especially when they are sustained and highly visible over the course of a generation or more. For example:

In the United States, since 1964, "numerous public and private organizations have engaged in a wide variety of activities intended to encourage smokers to quit smoking, or at least to adopt less hazardous smoking behaviour, or to convince young people not to start smoking" (Warner & Murt, p.374). By 1978, the percentage of the population aged 17 or older which reported smoking was, in every age cohort, among both men and women, lower than the percentage which would have been expected to smoke in the absence of this anti-smoking campaign. "By 1978, all of the male cohorts, except the two oldest, would have been expected to include over 60% smokers had the anti-smoking campaign never materialized; yet none of the cohorts reported even a majority smoking. For the females, in the absence of the campaign, close to half of the four youngest cohorts would have been expected to be smokers, but none had as many as 40% smoking" (p.386). In addition, "(f)or both men and women, the ... gap between reported and estimated rates in 1978 grows larger as one moves from the older to the younger cohorts (except for the youngest cohort of women) (p.386). ...

If cohorts born after 1960 adopt smoking behaviour similar to the youngest cohorts in (this) study - and recent data suggest decreasing rates of smoking among teenagers - the simple passage of time will further reduce the aggregate percentage of the population that smokes" (p.387).

Moreover, the changes in values and norms reflected in such findings "may also have important effects on the outcome of specific intervention experiments" (Leventhal & Cleary, p.382), making it "easier to induce and sustain" individual changes in behaviour.

This experience suggests that, over time, sustained public education by a wide range of public and private organizations might, for example, reduce social pressures to drink, sharply discourage drunkenness and drinking in high-risk situations, and offer support to individuals who wish to drink little, if at all.

Certainly, in some cultural settings, religious and moral suasion have been significant elements in preventing alcohol-related problems.

It should also be noted that public education is often seen as relevant to accomplishing other purposes - among them, the following:

- increasing the public and political visibility of alcohol-related problems;
- fostering awareness that prevention of alcohol-related problems is a collective responsibility;
- increasing communication and cooperation among groups and organizations with complementary interests in prevention efforts; and
- developing, over time, a climate in which additional measures to prevent alcohol-related problems can be proposed and accepted.

And some authors point out the "educative function" of legal measures to prevent alcohol-related problems (Bonnie, p.178; Moore, p.90; Curran makes similar point) - for example, minimum age requirements and restrictions on advertising of alcoholic beverages.

2.2.2 Education of health professionals and other primary health care workers

Education and training of persons who provide health care might be expected to prevent or reduce a variety of specific alcohol-related problems - among them, the following:

- adverse alcohol-drug interactions;
- combined dependence on alcohol and drugs;
- adverse effects of alcohol consumption during pregnancy; and
- widespread alcohol-related problems, including the alcohol dependence syndrome, among health professionals themselves.

In addition, it could be expected to sharply increase

- the frequency with which patients are asked (as a routine part of health care contacts) how much and how often they drink;
- the ability of health professionals and other primary health care workers to associate presenting physical symptoms (or the results of routine laboratory tests) with alcohol consumption;
- the frequency of diagnoses of alcohol dependence syndrome;
- the frequency of diagnoses of other alcohol-related health problems; and

- the frequency of appropriate treatment for the alcohol dependence syndrome (whether by primary health care workers or specialists or in self-help associations).

Despite evidence that such outcomes could be greatly improved (Clare; Saunders et al., Boulton & Williams), evaluations of education and training programmes rarely attempt to explore them, partly because of the methodological problems involved. Instead, most studies simply measure short-term increases in knowledge (which routinely occur) and/or changes in attitudes toward alcoholics. There are few reports of long-term follow-up (Ewan, p.887).

Early studies of the attitudes of physicians and other health professionals toward alcoholics found these attitudes "to be pervasively negative and to limit diagnostic and therapeutic abilities" (Fisher et al., p.1686). Attempts to change attitudes were not generally successful (Fisher et al., p.1687), perhaps because "many of the programs were based on the assumption that attitudes would be favourably influenced merely by an increase in knowledge" (Ewan, p.887).

More recent studies suggest that attitudes can be improved by training which emphasizes clinical problems and provides considerable time for small group discussion (Chappel); opportunities to meet recovering alcoholics and visit alcoholism treatment programmes are also considered helpful. One study, concurring that "formal education is of limited value in changing attitudes", indicates "these deficiencies may be overcome if courses are combined with opportunities to gain support and experience" (Cartwright, p.420; Reynolds & Ried make a similar point).

The importance of improving the attitudes of health professionals toward alcoholics is weighed differently by different observers. It is argued by some that, faced with a limited amount of time in which to teach about alcoholism (for example, to medical students), the emphasis is best placed on acknowledging and exploring negative attitudes toward alcoholism and alcohol-dependent patients (Nocks, 1980); the conviction is that such efforts are "important prerequisites of positive educational outcome, particularly ... augmented clinical skills" (Grant discussing Nocks). Others have suggested abandoning attitude change as an indicator of training effectiveness and relying, instead, on "more reliable, more easily validated behavioural indices" (Waring, p.414).

Unfortunately, only a handful of studies have reported such outcomes. For example:

At the end of a seven-month (14-hour) course on alcoholism, participants in a family practice residency training programme located in a clinic for ambulatory patients had identified twice as many alcoholics as had been identified in the previous four years the clinic had been in operation. Since the identified alcoholics were all patients before the programme began, the increase could be attributed to improved diagnostic practices rather than the addition of new patients. A year after instruction ended, still more patients had been identified as alcoholics. "Although ... the number of identified alcoholics was far below that which might reasonably be expected in a representative population, the residents ... made major strides in confronting a formerly seriously neglected health problem". Instruction included diagnostic criteria and specific treatment guidelines were established (Fisher et al., p.1692).

A professional education programme about the risks of drinking during pregnancy was conducted over a two-year period. "Advice of obstetricians to patients was measured both before and after the programme. There was a significant increase in the proportion of obstetricians asking about current alcohol use of patients and in the proportion routinely recommending that alcohol be limited during pregnancy. When asked by their patients about possible effects of alcohol on the fetus, obstetricians were more likely to mention fetal alcohol syndrome as a specific risk after the educational program. Patients of these obstetricians also reported similar, although somewhat more conservative attitudes. While no control group without access to the educational program was available, sources of information about drinking and pregnancy cited by obstetricians indicated that the program was influential in the change that occurred in the 2-year period" (Little et al., p.23).

Residents and staff of a hospital department of obstetrics and gynaecology were given a one-hour lecture annually to teach them to identify women "whose level of (alcohol) consumption placed their fetus at risk" (Weiner et al., p.230). In addition, a ten-question drinking history, providing a "structured format for inquiring about alcohol use", was printed on the patient charts used in the hospital's prenatal clinic. The questions were to be incorporated into the regular procedures for registration at the clinic. Utilization of this format for taking a drinking history, measured for six time periods between September 1978 and March 1981, ranged from 92% to 33%. Since, prior to the training program, few patient charts contained drinking histories, even 33% represented a "marked increase" in the number of inquiries. "Obstetrical staff was more likely to complete the (drinking history) when ... alcoholism research staff was visible in the clinic and readily available for consultation and referral" (Weiner et al., p.230). A directive from the chief of obstetrics and gynaecology that all prenatal charts should include a drinking history "also improved compliance".

An eight-week, on-site training program on alcoholism for nurses and social workers with administrative and management responsibilities found that participants significantly increased their alcohol-related work activities during the year after training. Furthermore, their activities (previously consisting of such activities as referral for services) were more "commensurate" with their positions and the arena in which their organizations operated. For example, "trainees had modified their organizations' policies to serve alcoholics, retrained their own and other agencies' staff, offered their organizations' services, and prepared grant requests to plan and build a network of comprehensive alcoholism services within their communities" (Waring, p.413-414). Measures of attitude change "showed no appreciable differences" (p.406).

In addition, in-hospital programmes which provide hospital staff with consultation on alcoholism (and other support and assistance in identifying alcoholic patients and referring them to treatment) report improved diagnostic ability, improved coordination of treatment planning, and greater continuity of care (Galanter; Nocks, 1981; Lewis & Gordon).

Many substantial efforts to provide training about alcohol-related problems have not, to date, been formally evaluated. These include:

- training for health professionals and other primary health care workers in many developing countries;
- seminars on alcohol and drug dependence conducted by the World Health Organization for physicians and other health professionals.

Nor has there been any attempt to evaluate a sustained, long-term programme of continuing education.

It should be noted that education and training of persons who provide health care are often seen as relevant to accomplishing purposes other than prevention or early identification of specific alcohol-related problems - among them, the following:

- encouraging public education about alcohol-related problems;
- promoting the development of national policies (and community action) to prevent alcohol-related problems; and
- increasing the availability of treatment for the alcohol dependence syndrome.

Education and training about alcohol-related problems is frequently provided to other professional groups whose work offers opportunities for prevention; these include psychologists, social workers, teachers, police, lawyers, and clergy. Such programmes are rarely formally evaluated.

2.3 Measures for which evidence of effectiveness is mixed

2.3.1 Other restrictions on the distribution of alcoholic beverages

Statistical analyses of relationships between alcohol consumption, alcohol-related problems and various measures of the physical availability of alcoholic beverages (for example, density of different types of sales outlets) have produced widely varying results. This is generally attributed to differences in research design, differences in selection and definition of variables, the complexity of the question and/or the shortcomings of available methodologies.

Cumulatively, however, particularly over recent years, these studies suggest that

- differences in the availability of alcoholic beverages explain some of the observed variation in alcohol-related problems over time and place (see, for example, Lenke regarding crimes of violence), and
- different types of outlets affect different types of alcohol-related problems (see, for example, Douglass et al. and Rabow & Watts).

Studies of the actual impact of particular changes in availability offer clearer evidence of effectiveness. Such studies indicate that changes in availability considerably less dramatic than the sharp restrictions described in section 2.1.2 can also influence alcohol consumption and alcohol-related problems.

For example, there is a "major effect on consumption and problems of intoxication" if outlets for alcoholic beverages are closed for a whole day each week (Smart, p.229).¹

In 1977, State-owned stores for the off-premise sale of spirits and wines in a region of Finland were closed on Saturdays for eight months (though light and medium beer continued to be available at grocery stores). "The closure reduced public drunkenness and alcohol-related violence, as well as total consumption." There was no evidence of an increase in consumption of illicit alcohol (Smart, p.229, citing Säilä).

In Mexico, "in the month of December 1981, a decrease in the number of accidents, arrests, etc., occurred in one state that carried out an experiment to see if alcohol consumption would drop when sale of liquor was limited to certain hours and days of the week" (Medina-Mora, p.255).

In Sweden, in 1981, State-owned stores for the off-premise sale of strong beers, wines and spirits were closed on Saturdays during the summer, on an experimental basis (though light beers continued to be available at grocery stores). The closure reduced drunkenness, domestic disturbances, crimes of violence (assault) and public disturbances. The stores were then closed permanently on Saturdays from June 1982 and most of the effects observed during the experiment persisted. More specifically, "the amount of drunkenness, domestic disturbances, crimes of violence and offences inflicting damage also decreased during the summers of 1982 and 1983, as a result of the closing. The effects of the Saturday closing during the rest of the year are not equally clear-cut." In particular, "there is no positive effect on outdoors assault between unacquainted persons and on offences inflicting damage" (apparently because of an increase on Fridays greater than the decrease on Saturdays, "partly caused by a

¹ The effects of opening outlets for an additional day each week have not been equally studied. A Scottish survey found an increase in alcohol consumption among men aged 45 or younger after "public houses" were permitted to open on Sunday. The sub-groups which had the higher increases were those with the highest consumption levels (for example, young men, skilled manual workers and single men). However, the design of the study did not permit attributing the increased consumption to the additional day (Knight & Wilson).

general upward trend, which is independent of the Saturday closing"). However, "drunkenness, domestic disturbances and indoors assault between acquainted persons decrease independent of the time of year" (Olsson & Wikström, 1984, p.95).

There is also some evidence that increased availability of a particular type of alcoholic beverage can increase total alcohol consumption - even if that beverage had been available to some extent, previously.

In the United States, four states implemented regulatory changes that increased the availability of wines. The nature and extent of this increased availability varied from State to State. However, in every case, grocery stores were authorized to sell wine (or certain types of wine) for the first time;¹ in two cases, the price of wine was somewhat lower in these new outlets than in the state-controlled stores. "In three of the four states, wine consumption [per capita 21 years of age and over] was found to be significantly greater in the years of the changes than one would expect, based on the ... trends of the previous eight to thirteen years ... (S)ubstitution from beer or spirits to wine was not found The increases were specific to wine only, indicating it is highly improbable that the increases were caused by more generalized factors, such as lowering of the drinking ages or economic conditions" (Macdonald, forthcoming).

A sharp increase in the number of grocery stores licensed to sell alcoholic beverages has previously been associated with increases in alcohol-related problems among women and young people. More specifically:

In England and Wales, the number of supermarkets licensed to sell alcoholic beverages increased fourfold between 1966 and 1973. Beginning in 1967, there were sharp increases in the number of convictions for drunkenness by persons under 18 and women aged 18-30 (despite a steady or downward trend in convictions for drunkenness by people of all ages and sexes for the six preceding years which persisted after 1967 for men over 21 and women over 30). By 1973, convictions for drunkenness of women aged 21-30 had more than doubled and of women aged 18-20 had almost tripled; convictions of girls under 18 had more than tripled and of boys under 18 had more than doubled. A variety of other possible explanations for these increases were ruled out (Williams).

However, individual small changes in merchandising practices, hours of sale, and type, location, and frequency of outlets are generally found to have "small or insignificant effects" on total alcohol consumption and alcohol-related problems (Smart, p.229). For example:

In Scotland, in 1976, the law was amended to permit "licensed premises" to remain open for an extra hour in the evening on weekdays. Surveys to monitor the effects of this change found "no statistically reliable evidence of overall increase (or decrease) in [average] consumption" subsequent to the change (Knight & Wilson, p.vii). Furthermore, "examination of statistics of drink-related offences known to the police provides no evidence of increased numbers as a result of the extra permitted hour's drinking and there is some evidence of a decrease possibly associated with the change. The distribution of the timing of offences shows substantial decreases between 10 p.m. and 11 p.m. with corresponding later increases. Very similar results are found from an examination of road accident statistics" (Bruce, p.136).

¹ As a result, in the State of Idaho, the number of outlets selling wine increased from 70 to 1,000; in the State of Maine, it increased from 65 to 1,400; in the State of Washington, 4,000 grocery stores which had previously sold only Washington wine were permitted to sell wine made outside the State (previously available in about 300 outlets).

In many cases, of course, "the variation studied has not been very great" (Smart, p.227). And, where alcohol consumption is fairly high and alcoholic beverages already widely available, a small change in availability may cause an increase in consumption which is not large enough to be statistically significant but is, nonetheless, real. However, a large body of Scandinavian research suggests that, with appropriate data and research methods, the effects of "quite small changes" in availability can be demonstrated (Mäkelä et al., 1981b, p.52).

It must be remembered, as well, that the capacity of the retail trade for alcoholic beverages can (and does) increase even where the number of outlets is stable or declining: discount stores and supermarkets replace specialty stores, the average unit size of on-premise outlets increases, and self-service replaces service by shop assistants.

The cumulative effects of "gradual, incremental and perhaps synergistic changes" in the availability of alcoholic beverages (Mäkelä et al., 1981a, p.94) may well be substantial (Moore, p.76; Smart, p.225, cites ARF 1978 as making similar point) but they are, at present, unknown. Unfortunately, analysis of such change is very difficult. For example:

In Canada, in the province of Ontario, "there have been more than 30 liberalizations of minor aspects of the control laws ... during the past 20 years. Similar changes occurred in other Canadian provinces during the same (period of) time .. several changes were usually made at the same time and no changes occurred in isolation ... large increases in affluence ... also occurred, the sobering influence of the temperance movement ... declined, and advertising of alcoholic beverages ... increased" (Smart, p.225).

A recent study which took a historical rather than quantitative approach to this question concluded that "non-fiscal alcohol controls cannot be regarded as the primary cause" of increases in alcohol consumption and alcohol-related problems which occurred (between 1950 and 1975) in seven North American and Northern European societies (Mäkelä et al., 1981a, p.91). But "the policy approach taken by most governments reinforced the increasing acceptance of alcohol into people's everyday life, and made way for expanding the supply" of alcohol (Mäkelä et al., 1981a, p.111).

Indeed, as a recent study of alcohol and public policy in the United States concluded, "it seems reasonable to suppose that increased availability of alcoholic beverages in restaurants, cafeterias, in workplaces, sports arenas, theatres, and so forth would have an effect on per capita consumption; generally speaking, if the practice of drinking is integrated into a wider range of day-to-day customary activities, the quantity of consumption will increase. The question of how many and what types of public places should be permitted to accommodate drinking then becomes in part an issue of public health, albeit one that can neither be readily quantified nor simply resolved" (Moore, p.76).

The impact on alcohol-related problems of many types of changes in availability have not been studied - among them, permitting the sale, possession and consumption of alcoholic beverages in sports arenas; establishing large hotel and other tourist facilities; permitting the sale of alcoholic beverages in gasoline stations, along highways, or near places where workers are paid; and packaging alcoholic beverages in more portable containers.

Some authors suggest that increased availability of alcoholic beverages is a response to demand rather than a factor influencing consumption. However, at least with regard to significant changes in outlet density, "it appears unlikely that this describes the relationship fully" (Macdonald & Whitehead, p.482). In such cases, the time sequence of events and the strength of the association (among other factors) indicate that availability also influences consumption (Macdonald & Whitehead, p.483).

Some countries have established government monopolies to control the distribution of alcoholic beverages. These vary widely in scope. For example, they may exist at national or subnational levels; may apply to some or all alcoholic beverages; may include wholesale and/or retail trade; may cover on-premise and/or off-premise outlets. Their purposes also vary widely. Although, in some instances, such systems have been established in the belief

that State monopolies "obviate competition and the stimulation of consumption by private enterprise," there is no clear evidence that alcohol-related problems are, as a result, less prevalent than they would otherwise be (Moser, p.101, citing Popham & Christie).

It should also be noted that restrictions on the distribution of alcoholic beverages are often seen as having important symbolic effects.

2.3.2 Regulation of advertising and other promotion of alcoholic beverages

It is not known whether or to what extent advertising for alcoholic beverages influences per capita consumption of alcohol or the nature and level of alcohol-related problems.

Econometric studies (which usually consider the effects of marginal changes in advertising volume as measured by marginal changes in expenditures for advertising) usually conclude there is no significant relationship between advertising and per capita consumption. Where relationships are observed, they are generally small and often contradictory (Strickland, p.203; van Iwaarden, 1983, p.228). In brief, neither the existence nor the direction of a causal link between advertising and per capita consumption has been established.

Indeed, many studies find it "just as likely that increased sales will stimulate advertising expenditures as that advertising will stimulate sales" (Smart p.241; van Iwaarden, 1983, p.226). Some note that "in a fairly stable market the advertising budget of a certain product in general is a fixed percentage of the sales volume" (van Iwaarden, 1983, p.225, citing Schmalensee, 1972). And there is no lack of empirical support for the alcoholic beverage industry's argument that brand advertising simply shifts the distribution of market shares, without increasing total demand (van Iwaarden, 1983, p.226, Smart, p.240).

Other studies, however, point out that under certain conditions advertising may increase total demand (van Iwaarden, 1983, p.224, citing Borden) - for example, when social, economic and technological forces are "favourable to the spontaneous expansion of demand" (Whitehead, 1983, p.133, citing Lambin). For developing countries in which a large portion of the population does not presently drink alcoholic beverages, disposable income is rising (or the relative price of alcohol falling), and transportation and distribution networks developing rapidly, these findings may warrant special attention.

It must also be noted that advertising is only one element of a complex "mix" of marketing techniques (consisting, among other things, of price, quality, assortment, distribution, promotion at the point of sale, and sponsorship of sports and other events) whose combined impact may well be substantially greater.

The effects of alcoholic beverage advertising on population subgroups believed to be especially vulnerable to advertising messages (for example, young people) and/or the particular targets of such advertising (for example, women and persons in developing countries) have only rarely been studied, except perhaps within the alcoholic beverage industry.

Recently, however, two American surveys explored the impact on young people of advertising for alcoholic beverages. One of them concluded that televised advertising has "meagre effects on the level of consumption" by adolescents in school, which are "rarely translated into effects on alcohol problems"; in contrast, interpersonal influences, especially the proportion of close friends who drink, were found to have significant impact both on consumption and problems (Strickland, p.221). The other concluded that young people [in school] who say they have seen more television and magazine ads for beer, wine, and liquor "generally drink more" or, if they have never drunk, more likely to report they plan to drink in the future (Atkin et al.); peer influence "appears to play a bigger role [than advertising] in beer and wine drinking, while the contribution of advertising is relatively greater for liquor drinking" (Atkin et al., p.165). Neither study permits the inference that exposure to advertising causes consumption.

Unfortunately, there are no studies which explore the cumulative, long-term effects of advertising on alcohol consumption and alcohol-related problems - over the course of a generation, for example. And econometric analysis offers little insight into the nature and direction of changes which might follow a dramatic reduction in advertising where it has long been widespread or a dramatic increase in advertising where it has been largely unknown.

A few studies have attempted to analyse the content and/or implicit messages of advertising for alcoholic beverages - i.e., that alcohol consumption not only entails no risk but is actively associated with success, pleasure, fellowship, social status, sexual attractiveness, sportsmanship, sophistication. These studies have been criticized on both methodological and theoretical grounds, including imprecise definitions, uncertain reliability, and inferring the effects of advertisements from their content (Strickland et al.).

Despite the substantial number of countries in which restrictions on alcoholic beverage advertising have been adopted in recent years, research on the effects of such action is very limited. That which does exist offers no evidence that restrictions on advertising reduce alcohol consumption or alcohol-related problems. For example:

In Canada, in the province of British Columbia, a 14-month ban on advertising (implemented in 1971) had no effect on annual or monthly per capita consumption (ARF, 1981, p.167).

In Canada, in the province of Manitoba, beer consumption increased significantly under a 1974 ban on advertising for beer (as it did in a neighbouring province, where there was no ban, over the same time interval) (Smart, p.243).

In the United Kingdom (which has no ban) and Ireland (in which liquor commercials are prohibited), "it is difficult to demonstrate any effect of advertising on alcohol use" (van Iwaarden, 1983, p.234, citing Lynn).

The impact of the Canadian bans was influenced by continuation of print and broadcast advertising which originated in neighbouring provinces and across the United States border (Smart, pp.242 and 243); the impact of the Irish ban may be similarly influenced by advertising originating in the United Kingdom.

It is sometimes noted that high per capita consumption of alcohol and serious alcohol-related problems exist in a number of countries which have long prohibited all advertising for alcoholic beverages. This would seem to confirm the observation that advertising is only one of many elements in the marketing of alcoholic beverages.

Since national tax laws often encourage expenditures for advertising of alcoholic beverages (as for other commodities) by defining them as deductible business expenses, it is sometimes argued that amendment of such laws might help prevent alcohol-related problems. However, no research has been conducted on this point.

Studies of the impact of regulating advertising and promotion for tobacco have reached conclusions which may be relevant as well to alcohol. For example:

In France, which has a "strong partial ban" on advertising and other promotion of tobacco (Roemer, p.28), "recent evidence ... indicates that when advertising is banned as part of an overall anti-smoking campaign there is both a reduction in consumption and a change in attitude towards smoking on the part of young people" (Roemer, p.34, citing Denoix).

In several countries, "partial advertising bans and voluntary restrictive codes have been tried and found wanting as tobacco manufacturers have diverted expenditure into other forms of promotion, negotiated weak codes of practice, or found loopholes in such codes of practice as have been agreed" (WHO Expert Committee, 1979, p.55).

For 15 countries of the Organization for Economic Cooperation and Development, recent evidence suggests that countries with "legislative programmes" to reduce smoking (including, for example, restrictions on advertising and promotion, the addition of health warnings to packages, and controls on smoking in public places) "have reduced ... national tobacco consumption more" than countries "employing an approach based upon voluntary agreements with the tobacco industry" (Cox & Smith, p.578).

It should also be noted that regulation of advertising for alcoholic beverages is often seen as relevant to accomplishing purposes other than reduction of alcohol-related problems - among them, the following:

- signalling the government's conviction that alcohol consumption poses serious risks to health and social well-being;
- increasing the credibility of other governmental actions to prevent alcohol-related problems;
- creating an environment in which public education about risks associated with alcohol consumption has greater opportunity to be effective; and
- reducing the possible influence of advertising revenues on editorials and news reports about alcohol-related problems.

In addition, it is often seen as having important symbolic effects.

2.3.3 Encouraging consumption of beverages with lower alcohol content or no alcohol content at all

"Within any system of regulation, the ... structure of prices, the control of the distribution network, the setting of drinking age limits, and other restrictions generally favour beverages with a low alcoholic content" (Bruun et al., pp.71-72). Unfortunately, the effects on alcohol consumption and alcohol-related problems of systematically favouring beverages of low alcohol content in this manner have not been evaluated.

Sharp price differentials have been known to shift consumption from distilled spirits to beer, with consequent reductions in total alcohol consumption and in some alcohol-related problems. For example:

In Denmark, "during World War I, the price of ... akvavit was raised from 0.9 Kronor to 11 Kronor per litre; the corresponding increase for beer was from 0.15 to 0.24 Kronor. This drastic measure reduced the rate of per capita alcohol consumption from 6.7 to 1.6 litres of absolute alcohol within two years. The decrease was mostly due to the diminished consumption of akvavit ... Denmark was thereby transformed from a primarily distilled spirits drinking country to a beer drinking country. Not only was consumption affected, but the rate of registered cases of delirium tremens declined from 27 to 2 per 100 000 inhabitants, and there was a corresponding decrease from 12 to 2 in the death rate from [chronic alcoholism]" (Bruun et al., p.73). Per capita consumption did not reach pre-World War I levels again for nearly three decades (Frankel & Whitehead, p.65).

The Danish action was taken for reasons unrelated to prevention of alcohol-related problems. In some countries, however, governments have encouraged the substitution of beverages of lower alcohol content (usually beer or wine for distilled spirits) in an explicit effort to reduce alcohol-related problems. For example:

In Finland, in 1969, the introduction of medium beer (at the same time as the number of outlets was sharply increased and other restrictions on availability lifted) increased per capita consumption by 46% in the first year and proportionately increased the number of heavy users. There was no compensatory reduction in consumption of distilled spirits (Moser, p.108).

In Canada, the introduction of light beer in Ontario resulted mostly in substitution of one alcoholic beverage for another, but "there was some increase in consumption with the change to light beer with meals" (Smart, p.232).

These attempts are generally judged failures, "the net result being a 'cumulative pattern of increasing consumption'" (Moser, p.103, quoting de Lint). One review suggests that outcomes might be different if "appropriate changes in price and availability are made at the same time" (Smart, p.232). It appears important, however, that governments not restrict production or distribution of beverages of lower alcohol content (for example, within a beverage type).

The effects on alcohol consumption and alcohol-related problems of increasing the availability of non-alcoholic beverages have not been systematically evaluated. However, in some countries, alcoholic beverages are less expensive than fruit juices and soft drinks and non-alcoholic beverages (including water) are not always easily available.

Although the risks of some alcohol-related problems may be greater with the consumption of one alcoholic beverage than another, it must be remembered that consumption of low-alcohol beverages is no protection against development of alcohol-related problems; the more significant factor is total amount of alcohol consumed.

2.3.4 Controls on production of alcoholic beverages

Controls on production of alcoholic beverages take many forms. They include regulation of commercial production, limits on legal home production, limits on the production of raw materials used to make alcoholic beverages, and efforts to control illegal production. In general, such controls are established for economic and fiscal purposes, with little attention to their impact on alcohol-related problems, and evidence of their direct effects on alcohol consumption and alcohol-related problems is largely descriptive.

As noted above, however, they can be expected to influence the effectiveness of other measures to prevent alcohol-related problems - among them, increases in the relative price of alcoholic beverages (see section 2.1.1) and restrictions on distribution (see sections 2.1.2 and 2.3.1). In addition, it is known that restrictions on home distilling sometimes help reduce fatal alcohol poisonings.

Establishment of a State monopoly for the production of alcoholic beverages is believed to have varying effects on alcohol-related problems, depending in part on the major purpose for which it is established.

2.4 Measures for which there is virtually no evidence of effectiveness, though they seem promising

There are a number of measures which might prevent specific alcohol-related problems for which very little evidence of effectiveness currently exists, though the logical argument for their value is strong and/or efforts to date have shown promise. These include efforts: (1) to reduce alcohol-related accidents in the workplace; (2) to prevent physical and psychological problems among children whose parents are alcoholics; and (3) to modify physical and social environments so that when drinking and drunkenness do occur certain harmful consequences will not also occur.

A substantial proportion of the work force in almost every country engages in work requiring the use of fairly complex machines, tools, equipment, and products. In addition, certain occupations pose exceedingly high risks to the worker, his or her colleagues, and many others if the worker drinks on the job or has drunk recently enough to have an elevated blood-alcohol level while working; such occupations are not limited to developed countries. Some efforts have been made to address these problems. For example:

In Austria, a decision by workers in a nationalized steel enterprise to refrain from drinking during working hours resulted in a decline in work accidents (Moser, p.221). And there are laws in several countries which prohibit supervisors from permitting employees to enter the place of work in a state of inebriation (Moser, p.219).

Alcohol-related problems in employment settings are manifested not only in accidents but also in absenteeism, illness, decreased production and quality of work, poor management decisions, loss of trained personnel, and disability payments. The economic implications are substantial.

The children of alcoholics are at substantially greater risk of developing alcoholism than the general population. They may also be at greater risk for a variety of other physical and psychological problems. And there is widespread concern, in both developed and developing countries, for children neglected by parents with alcohol problems. In recent years, experimental efforts have been made to provide services which may intervene in these developments. However, it is not yet possible to assess the potential of such efforts on a large scale.

A recent American study argues that technological improvements which make the physical environment "more tolerant of inept (including drunken) behaviour" will reduce alcohol-related casualties. More precisely:

"If everyday materials are made less likely to burn, cut, trip, or gash people who are temporarily operating below normal efficiency, alcohol-related casualties will decline. Since alcohol-related casualties tend to concentrate in the most severe categories - deaths and permanent disabilities - safety improvements will affect alcohol-related injuries most dramatically" (Moore, p.102).

And some researchers argue that "the social environment can be manipulated to decrease the exposure of drinkers to alcohol-induced casualties" (Moore, p.105). Such interventions include driving an intoxicated friend home from a party or other actions "to put a social cushion between drinkers and potentially hazardous environments". These have not been systematically evaluated.

TABLE 1 Policy measures of documented effectiveness in reducing alcohol consumption and preventing specified alcohol-related problems*

| POLICY OBJECTIVES | P O L I C Y M E A S U R E S | | | | Increasing probability of detection/punishment for drinking/driving |
|--|--------------------------------------|---|---|--------------------------|---|
| | Increasing relative price of alcohol | Increasing minimum legal "drinking age" | Restricting distribution of alcoholic beverages | Sharply Not so sharply** | |
| PREVENT ALCOHOL-RELATED PROBLEMS | | | | | |
| Traffic accidents/injuries/deaths | • | • | | | • |
| Public drunkenness | | | • | | |
| Violence | | | • | | |
| Cirrhosis deaths | • | | | | |
| Hospital admissions for detoxification/other alcohol-related diagnoses | | | • | | |
| REDUCE ALCOHOL CONSUMPTION | | | | | |
| Total consumption | • | | | | |
| Heavy consumption | • | | | | |
| FOR MORE INFORMATION, SEE SECTION | 2.1.1 | 2.1.3 | 2.1.2 | 2.3.1 | 2.1.4 |

* Based on studies cited in text.

** Evidence of effectiveness is mixed, depending on the nature and magnitude of the restriction.

3. CONCLUSION

It is clear from the preceding pages that national action to prevent alcohol-related problems cannot be based on scientific evidence alone. In this area of public policy, as in many others, information is incomplete and evidence conflicting. So national decisions will require judgements - on other than scientific grounds - "about science, about values, and about the political implications of [alternative] courses of action" (Whitehead, 1976, p.39).

In some countries, "poverty, suffering, and the incidence of disease are so great that the effect of alcohol is only marginal" (Armyr et al., p.164). In others, alcohol-related problems are one of the two or three most significant public health problems. Wherever a country may be located along this spectrum at a particular point in time, perceptions within the country will vary widely on a number of critical points:

- What constitutes an "alcohol-related problem"?
- What constitutes an "alcohol-related problem" requiring the government's attention?
- How important are these relative to other health problems?
- How important are they relative to other social and economic problems?
- What measures to prevent them are relevant, workable, acceptable?
- How much of the nation's energy and attention should be devoted to the effort?

The answers to such questions will be profoundly influenced by a country's history and culture (including its drinking patterns), its social and economic conditions, its national goals, and the views and values of its citizens and political leaders.

As a consequence, the priority accorded to prevention of alcohol-related problems by different Member States will vary widely. But, in every country, this priority should be established in full knowledge that alcohol is "a drug of dependence, a toxic substance, ... a beverage with potentially negative health-impairing consequences and potentially negative effects on behaviour and social relationships" (WHO, 1980, p.34) - to the detriment of family and community life and the achievement of national goals.

The measures described above will not, of course, eliminate alcohol-related problems. But they can be expected to reduce their incidence. And the combined impact of several measures will often be greater than their separate, individual effects.

Adopting such measures does not preclude continued study of the causes of the alcohol dependence syndrome - nor the incorporation of research findings into future governmental efforts to prevent alcohol-related problems. Nor does it deny the influence of historical change on alcohol consumption, alcohol-related problems, and governmental policies about alcohol. But "(t)he fact that policy changes can be understood or even explained in terms of social history does not imply ... these same policies cannot be affected by conscious action" (Mäkelä et al., 1981a, p.110).

As public and political interest in preventing alcohol-related problems develops and national priorities become clearer, it may prove helpful to have a brief, simple way of characterizing the general direction or goal of the various measures being undertaken. For example, depending on national circumstances and decisions, the national goal might be described as follows:

- to protect and safeguard existing low levels of alcohol consumption;
- to ensure that governmental action does not increase the risk of alcohol-related problems;
- to encourage and support lower levels of consumption;

- to discourage hazardous drinking;
- to reduce disruption of family life and of social and economic development.

Such a formulation (which is obviously subject to change over time) will not obviate the need for policy decisions nor simplify them nor reduce the intensity of public and political debate. But it will provide a frame of reference for that debate and a standard against which policy decisions can be measured.

Unfortunately, given the reinforcing and addictive properties of alcohol and the strength of the economic interests in its production and distribution, it can be anticipated that, in the absence of vigorous efforts to prevent them, alcohol-related problems will continue to grow.

In issuing this document, it is the hope of WHO that Member States will be able to make use of it in the development and evaluation of their own policies to prevent alcohol-related problems. By learning from the experience of others, it may be possible to take bolder and more innovative steps. Effective national policies on alcohol-related problems can thus become an integral part of the process of national health development and planning which is central to the efforts of Member States to achieve health for all by the year 2000.

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