

Chapter 7 – The effectiveness of alcohol policy

Alcohol policies can be grouped within five headings: (i) policies that reduce drinking and driving; (ii) policies that support education, communication, training and public awareness; (iii) policies that regulate the alcohol market; (iv) policies that support the reduction of harm in drinking and surrounding environments; and (v) policies that support interventions for individuals. Since the 1970s, considerable progress has been made in the scientific understanding of the relationship between alcohol policies, alcohol consumption and alcohol-related harm.

The drinking-driving policies that are highly effective include unrestricted (random) breath testing, lowered blood alcohol concentration (BAC) levels, administrative license suspension, and lower BAC levels for young drivers. The limited evidence does not find an impact from designated driver and safe drive programmes. Alcohol locks can be effective as a preventive measure, but as a measure with drink driving offenders only work as long as they are fitted to a vehicle. The World Health Organization has modelled the impact and cost of unrestricted breath testing compared with no testing; applying this to the Union finds an estimated 111,000 years of disability and premature death avoided at an estimated cost of €233 million each year.

The impact of policies that support education, communication, training and public awareness is low. Although the reach of school-based educational programs can be high because of the availability of captive audiences in schools, the population impact of these programs is small due to their current limited or lack of effectiveness. Recommendations exist as to how the effectiveness of school-based programmes might be improved. On the other hand, mass media programmes have a particular role to play in reinforcing community awareness of the problems created by alcohol use and to prepare the ground for specific interventions.

There is very strong evidence for the effectiveness of policies that regulate the alcohol market in reducing the harm done by alcohol, including taxation and managing the physical availability of alcohol (limiting hours and days of sale and raising the minimum drinking age). Alcohol taxes are particularly important in targeting young people and the harms done by alcohol. If alcohol taxes were used to raise the price of alcohol in the EU15 by 10%, over 9,000 deaths would be prevented during the following year and an approximate estimate suggests that €13bn of additional excise duty revenues would also be gained. The evidence shows that if opening hours for the sale of alcohol are extended more violent harm results. The World Health Organization has modelled the impact of alcohol being less available from retail outlets by a 24 hour period each week; applying this to the Union finds an estimated 123,000 years of disability and premature death avoided at an estimated implementation cost of €98 million each year.

Restricting the volume and content of commercial communications of alcohol products is likely to reduce harm. Advertisements have a particular impact in promoting a more positive attitude to drinking amongst young people, and, even in advertisements that do not portray drinking of alcohol, young people perceive the characters as heavy drinkers. Self-regulation of commercial communications by the beverage alcohol industry does not have a good track record for being effective. The World Health Organization has modelled the impact of an advertising ban; applying this to the Union finds an estimated 202,000 years of disability and premature death avoided, at an estimated implementation cost of €95 million each year.

There is growing evidence for the impact of strategies that alter the drinking context in reducing the harm done by alcohol. However, these strategies are primarily applicable to drinking in bars and restaurants, and their effectiveness relies on adequate enforcement. Passing a minimum drinking age law, for instance, will have little effect if it is not backed up with a credible threat to remove the licenses of outlets that repeatedly sell to the under-aged. Such strategies are also more effective when backed up by community-based prevention programmes.

There is extensive evidence for the impact of brief advice, particularly in primary care settings, in reducing harmful alcohol consumption. The World Health Organization has modelled the impact and cost of providing primary care-based brief advice to 25% of the at-risk population; applying this to the Union finds an estimated 408,000 years of disability and premature death avoided at an estimated cost of €740 million each year.

Using the World Health Organization's models, and compared to no policies at all, a comprehensive European Union wide package of effective policies and programmes that included random breath testing, taxation, restricted access, an advertising ban and brief physician advice, is estimated to cost European governments €1.3billion to implement (about 1% of the total tangible costs of alcohol to society and only about 10% of the estimated income gained from a 10% rise in the price of alcohol due to taxes in the EU15 countries), and is estimated to avoid 1.4 million years of disability and premature death a year, equivalent to 2.3% of all disability and premature death facing the European Union.

INTRODUCTION

Evidence base

Over the last twenty five years, considerable progress has been made in the scientific understanding of the relationship between alcohol policies, alcohol consumption and alcohol-related harm (for example, see Bruun *et al.* 1975; Edwards *et al.* 1994; Babor *et al.* 2003). The evidence base includes time series analyses, econometric analyses, community studies and randomized controlled trials of interventions. Alcohol policies can be grouped within five headings: policies that reduce drinking and driving; policies that support education, communication, training and public awareness; policies that regulate the alcohol market; policies that support the reduction of harm in drinking and surrounding environments; and policies that support interventions for individuals with hazardous and harmful alcohol consumption and alcohol dependence. Although it is changing, the evidence base is still largely dominated by studies from North America, northern Europe, and Australia and New Zealand. Although there is no reason to believe that the results do not have policy significance for Europe as a whole, there is a need to broaden the evidence base across countries and cultures, a theme that we return to in Chapter 10. The chapter gives more space to discussing the evidence in relation to advertising policies, since this is a policy area of current substantial debate.

Summary sections

Each policy area is summarized with a table of effectiveness ratings. We have done this by using an updated version of the effectiveness ratings that were provided by Babor *et al.* (2003), using the classification system of Table 7.1.

Table 7.1 Effectiveness ratings used in this chapter.

Effectiveness	Breadth of Research Support	Cost Efficiency
<p>This criterion refers to the scientific evidence demonstrating whether a particular strategy is effective in reducing alcohol consumption, alcohol-related problems or their costs to society. The following rating scale was used:</p> <p>0 Evidence indicates a lack of effectiveness + Evidence for limited effectiveness. ++ Evidence for moderate effectiveness. +++ Evidence of a high degree of effectiveness ? No studies have been undertaken or there is insufficient evidence upon which to make a judgment.</p>	<p>The highest rating was influenced by the availability of integrative reviews and meta analyses. Breadth of research support was evaluated independent of the rating of effectiveness (i.e., it is possible for a strategy to be rated low in effectiveness but to also have a high rating on the breadth of research supporting this evaluation). The following scale was used:</p> <p>0 No studies of effectiveness have been undertaken + Only one well designed study of effectiveness completed. ++ From 2 to 4 studies of effectiveness have been completed. +++ 5 or more studies of effectiveness have been completed. ? There is insufficient evidence on which to make a judgment.</p>	<p>This criterion seeks to estimate the relative monetary cost to the state to implement, operate and sustain this strategy, regardless of effectiveness. For instance, increasing alcohol excise duties does not cost much to the state but may be costly to alcohol consumers. In this criterion, the lowest possible cost is the highest standard. Therefore, the higher the rating, the lower the relative cost to implement and sustain this strategy. The following scale was used:</p> <p>o Very high cost to implement and sustain + Relatively high cost to implement and sustain. ++ Moderate cost to implement and sustain. +++ Low cost to implement and sustain. ? There is no information about cost or cost is impossible to estimate.</p>

Source: Babor *et al.* (2003).

Estimates and costs of policy impact

Throughout the chapter, we also report the results of the World Health Organization’s CHOICE (CHOosing Interventions that are Cost-Effective) model, which provides estimates of the impact and cost of implementing policies in reducing Disability Adjusted Life Years (DALYs) (see Chapter 6) due to harmful alcohol use (Tan Torres *et al.* 2003; WHO 2002; Ezzati *et al.* 2002; Rehm *et al.* 2004; Chisholm *et al.* 2004; Rehm *et al.* 2003a,b; 2004; Rehm *et al.* 2001; Stouthard *et al.* 2000), re-calculated for the European Union. The CHOICE model determines intervention effectiveness via a state transition population model (Lauer *et al.* 2003), taking into account births, deaths and the impact of alcohol. Two scenarios are modelled over a lifetime (100 years): 1) no interventions available to reduce hazardous and harmful alcohol use (defined in the CHOICE model as more than 20g alcohol a day for women and more than 40g alcohol a day for men); and 2) the population-level impact of each specified intervention, implemented for a period of 10 years. The difference represents the population-level health gain due to the implementation of the intervention, discounted at 3% and age-weighted.

Costs covered in the CHOICE model are costs to governments and include *programme-level costs* associated with running the intervention, such as administration, training and media (Adam *et al.* 2003; Johns *et al.* 2003), and *patient-level costs* such as primary care visits (Fleming *et al.* 2000). The costs were calculated in international dollars (Adam *et al.* 2003; Johns *et al.* 2003) and

converted into euros, such that one euro buys the same quantity of health care resources in England as it does in Hungary. The model does not capture potential increases in workforce and household productivity among heavy drinkers following intervention, nor does it incorporate the economic consequences of alcohol-related crime, violence and harm reduction. Government's receipts from taxes are not counted.

CHOICE modelled specified interventions, which are described in each section. The models are used for illustrative purposes to give an indication of the impact and cost of certain interventions. **The fact that a specific intervention is modelled (for example reducing the availability of alcohol, or banning advertising) does not imply that the specified intervention is the one recommended for European policy (see Chapter 10).** Rather, since the model compares the intervention of a Europe without the specified intervention, its prime purpose is to provide comparisons for policy makers between the impact and costs of different types of interventions. The results are presented for three regions of the European Union, based on the WHO classification, Table 7.2.

Table 7.2 WHO classification of European Union countries based on mortality rates¹.

Europe A Very low child and very low adult mortality	Europe B Low child and low adult mortality	Europe C Low child and high adult mortality
Austria Belgium Czech Republic Denmark Finland France Germany Greece Ireland	Italy Luxembourg Malta Netherlands Portugal Slovenia Spain Sweden United Kingdom	Cyprus Poland Slovakia Estonia Hungary Latvia Lithuania

Social welfare and other sectors

Although this is not discussed in detail, alcohol policy should also be embedded in sound social welfare and fiscal policies. Social and economic policies that seek to improve conditions for the healthy development of children and youth, reduce disadvantage, increase equity, and strengthen communities will have a range of benefits including lower rates of the harm done by alcohol (Blane *et al.* 1996; Marmot and Wilkinson 1999).

REDUCING DRINKING AND DRIVING

Policies that regulate the alcohol market

Policies that regulate the alcohol market, including the price of alcohol, the location, density, and opening hours of sales outlets, controls on the availability of alcohol, and

¹ For full listing of countries in the three Europe sub-regions, see World Health Organization 2002.

on the promotion and advertising of alcohol, have an impact in reducing drinking and driving and related fatalities (see below) (Grube and Stewart 2004).

Lowering blood alcohol concentration (BAC)² levels

Lowering BAC levels consistently produces positive results in drink-driving behaviour at all levels and also leads to further reductions in alcohol road traffic accidents (Jonah *et al.* 2000).

US experience

Although many studies have been published on the effectiveness of the 0.8g/L blood alcohol concentration (BAC) laws in the US (Johnson and Walz 1994; Hingson *et al.* 1996; Hingson *et al.* 2000; Foss *et al.* 1998; 2001; Apsler *et al.* 1999; Voas and Tippetts 1999; Villaveces *et al.* 2003), they have varied in the statistical methods and the type of outcome measure used, so it is difficult to integrate the findings into an overall estimate of the effectiveness of the law (Beirness and Simpson 2002). A time-series analysis analyzed the introduction of the 0.8g/L in 19 states from 1982 to 2000, accounting for other key safety laws (administrative license suspension/revocation and safety belt laws), as well as economic conditions that might influence the effectiveness of the 0.8g/L law (Tippetts *et al.* 2005). The effect size combined across all 19 locations showed a 15% decline in the rate of drinking drivers in fatal crashes after the 0.8g/L laws were introduced. The reduction was greater in states that had an administrative license suspension/revocation law and implemented frequent sobriety checkpoints. The introduction of low BACs of 0.2g/L for young or inexperienced drivers has led to reductions in fatal crashes of from 9% to 24%. Studies in California demonstrated that publicity doubled the impact of new laws and new enforcement efforts (Voas and Hause 1987).

Australian experience

The reduction of the legal BAC limit from 0.8g/L to 0.5g/l in New South Wales found a 7% reduction in all serious crashes, an 8% reduction in fatal crashes, and an 11% reduction in single vehicle night time crashes (Henstridge *et al.* 1997). In comparison, random breath testing was associated with decreases of 19%, 48% and 26%, respectively. A simple pre-post comparison of the aggregate crash data for the three years prior to and following the introduction of the lower BAC limit from 0.8g/L to 0.5g/L in Queensland revealed net reductions of 11% for crashes which resulted in a hospital admission, 15% for injury crashes (but for which no one was admitted), and 12% for property damage crashes (Smith 1987; 1988). However, it does appear that some of the impact of lowering BAC levels wears off over time because, initially, drivers grossly exaggerate the certainty of apprehension in response to the publicity, but gradually become used to the new law and realize that their chances of detection are, in fact, not very high. Making motorists uncertain about the real risk of detection may paradoxically be the key to cost-effective deterrence (Homel 1988; Nagin 1998).

² BAC (sometimes called BAL, blood alcohol level), represents the amount of ethanol in a given amount of blood, and is noted as "weight by volume." The most commonly used measurements are grams of ethanol per 100 millilitre of blood (g/100ml), sometimes expressed as percentage by volume commonly used in the United States, and milligrams of ethanol per millilitre of blood (mg/ml), equivalent to grams per litre (g/L), used in much of Europe. For example, 0.05 g/100ml=0.05%=0.5 mg/ml=0.5g/L. In this report, g/L is used.

European experience

Lowering the BAC level from 0.5g/L to 0.2g/L level in Sweden in 1990 led to a reduction of fatal alcohol-related accidents by between 8% and 10% (Ross and Klette 1995; Norström 1997; Norström and Laurell 1997; Lindgren 1999; Borschos 2000). Denmark reduced its BAC from 0.8g/l to 0.5g/l on 1st March 1998. There

was some evidence for a reduction in all motor vehicle injury accidents and in accidents involving a driver with a BAC of greater than 0.5g/L in 1998, compared with 1997 (Bernhoft and Behrendorff 2003), but no change in fatal accidents.

Drink driving laws

The World Health Organization has modelled the impact and cost of unrestricted breath testing compared with no testing; applying this to the Union finds an estimated 111,000 years of disability and premature death avoided at an estimated cost of €233 million each year.

Unrestricted (random) breath testing

Unrestricted or random breath testing means that motorists are stopped with no restrictions by police and required to take a breath test, even if they have not been suspected of having committed an offence or been involved in an accident. Any motorist, at any time, may be required to take a test, and there is nothing that the driver can do to influence the chances of being tested. Testing varies from day to day and from week to week, and refusal to submit to a breath test is equivalent to failing. Twenty three studies of unrestricted breath testing and selective testing have found a decline of 22% (range 13%-36%) in fatal crashes, with slightly lower decreases for non-injury and other accidents for such enforcement strategies (Shults *et al.* 2001).

Australian experience

Australia is one of the countries with the most experience of random breath testing. In 1999, 82% of Australian motorists reported having been stopped at some time, compared with 16% in the UK and 29% in the US (Williams *et al.* 2000). The result was that fatal crash levels dropped 22%, while alcohol-involved traffic crashes dropped 36%, and remained at this level for over four years (Homel 1988; Arthurson 1985). A time series analysis for four Australian states found that unrestricted breath testing was twice as effective as selective checkpoints (Henstridge *et al.* 1997). For example, in Queensland, unrestricted breath testing resulted in a 35% reduction in fatal accidents, compared with 15% for checkpoints. Since their implementation, the drink driving enforcement and publicity campaigns in Victoria have persisted in their effectiveness in reducing serious crashes during peak alcohol consumption times (Tay 2005a; 2005b).

European experience

In the Netherlands, the implementation of experimental random breath testing resulted in a reduction of drivers with alcohol in their blood, but especially drivers with BAC levels above 0.5 g/L, the national legal limit (Mathijssen and Wesemann 1993).

License suspension

Suspending the license of those convicted of impaired driving is only partially effective as a way to reduce drink driving recidivism and alcohol-related crashes. Without some form of education, counselling or treatment program, the effects of suspension upon alcohol-impaired driving last only as long as the driver is incapacitated by the license suspension, and these periods can be relatively short (McKnight and Voas 1991; Ross 1992). The deterrent effect of any penalty is

benefited by certainty and immediacy (Ross 1984; Ross 1992; McKnight and Voas 2001). A review of 46 studies on license suspension found that suspension was followed by an average reduction of 5% in alcohol-related accidents and a reduction of 26% in fatal accidents (Zobeck and Williams 1994).

There is little evidence that prison sentences or fines have a specific deterrent effect by promoting avoidance of future offences (Voas 1986). Nevertheless, the authority to impose a prison sentence may provide the legal basis for referring offenders to treatment programs, which have been shown to reduce recidivism of drink driving in first and multiple offenders (Voas and Tippetts 1990). A meta-analysis of 215 independent evaluations of remedial programs found them to yield an average reduction of 8%-9%, both in recurrence of alcohol-impaired driving offences and in alcohol-related accidents (Wells-Parker *et al.* 1995).

Alcohol locks

One action to prevent drink driving offenders from driving while impaired is to place interlocks in the ignition to prevent an impaired driver from operating the vehicle. To operate a vehicle equipped with an ignition interlock device, the driver must first provide a breath specimen. If the breath alcohol concentration of the specimen exceeds the predetermined level, the vehicle will not start. As a measure to reduce circumvention of the device (i.e. someone else blows into the mouthpiece), random retests are required while the vehicle is running. Interlocks can also be used as a preventive measure, by being fitted to public service and heavy goods vehicles.

One review of eight studies of interlock programs conducted under the authority of a local court or a motor vehicle department found them to be more effective than full license suspension in preventing recidivism among alcohol-impaired drivers (Voas *et al.* 1999). However, seven of the studies found that, once the interlock is removed, offenders have the same recidivism rate as suspended offenders.

A systematic Cochrane review identified one randomised controlled trial (RCT), ten controlled trials, and three ongoing trials (Willis *et al.* 2004). In the RCT, recidivism was lower in the intervention group while the device was still installed in the vehicle, but the benefit disappeared once the device was removed. In all 13 non-randomised controlled trials, interlock participants again had lower recurrence of offences than the controls. However, the favourable results did not extend to the time period after the interlock was removed.

In 2000, a European research consortium explored the feasibility of alcolock programs in EU countries and concluded that impaired driving offences were reduced during interlock program participation and that accident rates were also reduced (Mathijssen 2005). As a result of the feasibility study, alcolock initiatives are being implemented in Belgium, Finland, Germany, Netherlands, Norway, Spain and Sweden. In the Netherlands, the target group will consist of DWI offenders who undergo a medical/psychiatric assessment and are declared "not unfit to drive", which represents about 10% of the multiple recidivists or those with a BAC above 1.8g/L, who are assessed. The alcolock program will be mandatory under administrative law and will have a duration of two years with the possibility of a six-month extension. It is estimated that the cost per installed alcolock is €2,200. Based on an estimated 65% reduced crash rate for alcolock users, the estimated benefit of the program is an annual reduction of 4-5 fatalities, at an annual program cost of €0.9 million.

Alcolock devices and programs were introduced in Sweden in 1999, with two types of programs (Bjerre 2005). A primary prevention strategy was initiated to prevent alcohol impaired driving in three commercial transport companies (buses, trucks, taxis). A secondary prevention trial was begun as a voluntary 2-year program for drink driving offenders involving strict medical requirements, including counselling and regular checkups by a medical doctor. Alcolocks in commercial vehicles have been well accepted by professional drivers, their employers, and their passengers, and the number of vehicles with alcolocks as a primary prevention measure is rapidly growing in Sweden. Three of 1000 starts in the primary prevention program were blocked by the alcolock after measuring a BAC higher than the legal limit and lock point of 0.2g/L. Only 11% of eligible drink driving offenders took part in the voluntary, secondary prevention program, of whom 60% had a diagnosis of alcohol dependence. During the program, alcohol consumption decreased as measured by five biological alcohol markers, and the rate of drink driving offences fell sharply from a yearly rate of approximately 5% to almost zero. However, those dismissed from the program appeared to return to their previous drink driving behaviour.

Restrictions on young or inexperienced drivers

Reviews have found that lower BAC limits for young drivers (for example, 0.1g/L to 0.2g/L) reduce injuries and crashes (Hingson *et al.* 1991 1994; Zwerling and Jones 1999), with reductions of between 9% and 24% for fatal crashes (Shults *et al.* 2001). A national study of US states found a net decrease of 24% in the number of young drivers with positive BACs as a result of lower BAC limits for young drivers (Voas *et al.* 1999). A combination of raising the minimum legal drinking age to 21 years and establishing zero tolerance (<0.2g/L BAC) for drivers younger than age 21 years are associated with substantial reductions in alcohol-positive involvement in fatal crashes in drivers younger than age 21 years in the United States from 1982 to 1997 (Voas *et al.* 2003). Graduated driver licence programmes place restrictions on the circumstances under which young or novice drivers are allowed to drive, such as prohibiting driving during certain hours or driving with other young people in the vehicle. Such programmes, which frequently have BACS of <0.2g/L, are effective in reducing motor vehicle fatalities among 15-17-year-old drivers by up to 19% (Morrisey *et al.* 2005).

Server training and civil liability

Training programmes for servers and bartenders for preventing impaired driving by identifying impairment, refusing service and providing transportation have been evaluated in North America, Australia, and the Netherlands. These have demonstrated a significant improvement in server knowledge and attitude, as well as discouraging over-consumption and encouraging alternative beverages. This effect is particularly strong when coupled with a change in the serving and sales practices of the licensed place, and with training for managers (Rydon *et al.* 1996; Saltz 1997). Success in reducing the risk of drink-driving has not been found in all studies, even when mandating the training of servers as a condition of licensing (Lang *et al.* 1998). However, when implemented as part of more comprehensive community-based programmes, responsible server programmes have been found to be effective, particularly for night time crashes for young people (Holder and Wagenaar 1994; Wagenaar *et al.* 2000).

The civil liability of alcohol retail establishments, who serve alcohol to intoxicated customers, has been established, particularly in the United States, often based upon common law, with very limited spread to other countries, but including Australia and Canada.

The importance of enforcement

An enforcement activity in which plain clothes officers visited licensed establishments that were serving visibly intoxicated customers showed a three-fold increase in refusals of service to pseudo-customers simulating signs of intoxication and a one-fourth drop in the percentage of arrested drivers coming from bars and restaurants (McKnight and Streff, 1994). The savings in accident costs were estimated at €75 for each Euro cost of enforcement.

This liability has been primarily reactive, that is, as a means of legal redress after service to an intoxicated person resulted in personal loss or injury (Mosher 1979 1987). This may, for instance, occur when an intoxicated driver, served by a retail establishment, crashes and injures or kills an innocent bystander. However, server liability can also be a preventive policy to encourage safer beverage serving practices and to prevent drink driving (Mosher 1983; 1987; Holder *et al.* 1993). States within the US that hold bar owners and staff legally liable for damage attributable to alcohol intoxication have lower rates of traffic fatalities (Chaloupka *et al.* 1993; Ruhm 1996; Sloan *et al.* 1994a) and homicide (Sloan *et al.* 1994b), compared to states that do not have this liability. When one State deliberately distributed publicity about the legal liability of servers, there was a 12% decrease in single-vehicle night-time injury-producing traffic crashes

(Wagenaar and Holder 1991), mediated by the effects of legal liability on the attitudes and behaviour of bar owners and staff (Holder *et al.* 1993; Sloan *et al.* 2000).

In many jurisdictions, it is illegal to sell an alcoholic beverage to purchasers considered to be at risk of injury, including the underage and the intoxicated. Violations can result in criminal actions and fines against sellers and administrative action, such as fines and license suspensions, against the establishments. Enforcement of laws prohibiting service to an intoxicated customer is rarer than enforcement of laws prohibiting sales to an underage customer. Most actions against servers appear to occur when the illegal service results in some form of harm, rather than from routine enforcement activity. The efficiency of alcohol-control efforts can be enhanced by focusing enforcement on establishments that are the most persistent violators. Arrested drivers queried for the sources of their last drink can identify the greatest sources of trouble.

Designated Driver and safe ride programmes

There is no universal definition of a “designated driver.” The most common definition requires that the designated driver abstain from all alcohol, be assigned before alcohol consumption, and drive other group members to their homes (see Ditter *et al.* 2005). Other definitions employ a risk and harm reduction strategy, in which the primary goal is not necessarily abstinence, but to keep the designated driver’s blood alcohol content (BAC) at less than the legal limit.

In practice, it appears that only a minority of designated drivers remain completely abstinent, and many people may apply the designated driver concept in ways that are unsafe. In a California survey, only 56% of respondents said that the designated driver should be chosen before drinking begins, and only 64% expected the driver to abstain from alcohol for 4 hours before driving (Lange *et al.* 1998). Also in some

cases, the “designated driver” may be chosen based on who in the group is the least intoxicated (Knight *et al.* 1993; DeJong and Wintzen 1999). Timmerman *et al.* (2003) found that the mean BAC for 66 designated drivers leaving university bars was 0.6g/L.

A systematic review was conducted to assess the evidence of effectiveness of designated driver programs for reducing alcohol-impaired driving and alcohol-related crashes by evaluating population-based campaigns that encourage designated driver use, and programs conducted in drinking establishments that provide incentives for people to act as designated drivers (Ditter *et al.* 2005). Only one study of a population based designated driver promotion campaign was identified. Survey results indicated a 13% increase in respondents “always” selecting a designated driver, but no significant change in self-reported alcohol-impaired driving or riding with an alcohol impaired driver (Boots and Midford 1999). Seven studies (five of which were reported in the same journal article, and six of which were by the same two principal authors) evaluated the number of patrons who identified themselves as designated drivers before and after programs were implemented, with a mean increase of 0.9 designated drivers per night (Brigham *et al.* 1995; Meier *et al.* 1998; Simons-Morton and Cummings 1997). An eighth study reported a 6% decrease in self-reported driving or riding in a car with an intoxicated driver among respondents exposed to an incentive program (Boots 1994).

Interpretation of these results was complicated by the fact that only two of the studies (Brigham *et al.* 1995; Simons-Morton and Cummings 1997) reported the number of patrons or groups of patrons in the bar during each observation period. Thus, although the incentive programs generally found small increases in the number of patrons identifying themselves as designated drivers, the extent to which these changes related to actual designated driver use was unclear. Finally, it was impossible to estimate the public health effects of observed changes in the number of self-identified designated drivers without information on what their behaviour would have been in the absence of a designated driver program. Thus, due to the small effect sizes observed, and the limitations of the outcome measures, the present evidence is insufficient to draw any conclusions about the effectiveness of either type of designated driver promotion program evaluated.

Further, no study has evaluated whether the use of designated drivers actually decreases alcohol-related motor vehicle-related injuries. However, some studies of designated drivers have assessed their BACs, which are strongly associated with crash risk. Studies indicate that the BACs of designated drivers are generally lower than those of their passengers and also lower than those of other drivers who are not acting as designated drivers (Lange *et al.* 2000), but still often higher than the legal limit for drinking and driving (Timmerman *et al.* 2003).

The potential impact of designated driver programs on alcohol consumption is another important consideration. Several studies indicate an increase in passenger alcohol consumption when a designated driver is available. One study estimated that the mean increase in the BACs of passengers of designated drivers was 0.17 g/L, (Harding *et al.* 2001), with young and high-risk drinkers particularly likely to increase consumption (Knight *et al.* 1993; DeJong and Wintzen 1999; Boots and Midford 1999).

Several communities have organizations that provide free rides largely to individuals who drive while being alcohol impaired. A survey of 335 ride services in response to calls from passengers or the drinking places serving them found the biggest obstacle to be the inability of more than 15% of the programs to transport the driver's vehicle

The Saving Lives Project

The Saving Lives Project conducted in six communities in Massachusetts, USA was designed to reduce alcohol-impaired driving and related problems such as speeding (Hingson *et al.*, 1996). In each community a full time coordinator from the local government organized a task force representing various city departments. Programs were designed locally and involved a host of activities including media campaigns, business information programs, speeding and drunk driving awareness days, speed watch telephone hotlines, police training, high school peer-led education, Students Against Drunk Driving groups, college prevention programs, and other activities. During the five years that the program was in operation, sites that received the Saving Lives intervention produced a 25% greater decline in fatal crashes than the rest of Massachusetts, a 47% reduction in the number of fatally injured drivers who were positive for alcohol as well as a 5% decline in visible crash injuries and an 8% decline in crash injuries affecting 16-25 year olds. In addition, there was a decline in self-reported driving after drinking (specifically among youth) as well as observed speeding. The greatest fatal and injury crash reductions occurred in 16-25 year old age group.

(Harding, Apsler and Goldfein 1998). Drivers were reluctant to leave their vehicles behind or return to the drinking location to collect their vehicles. Ross (1992) suggested that one approach to individuals could be to provide them with free taxi rides to drinking places. This would ensure their inability to drive away and, consequently, a heavy drinker would be forced to find alternative transportation to return home, as the vehicle would not be at the drinking location. One study found that if the safe ride program had not been in place 44% of drinkers would have driven themselves home (Sarkar *et al.* 2005). One third of the drinkers did not feel they had control over their choice to avoid drinking and driving.

School based education courses

A systematic review of the literature to assess the effectiveness of school-based programs for reducing drinking and driving and riding with drinking drivers identified thirteen peer reviewed papers or technical reports which met specified quality criteria and included evaluation outcomes of interest (Elder *et al.* 2005). The papers evaluated three classes of interventions: school based instructional programs, peer organizations, and social norming campaigns. For instructional programs, whereas the median effects of five studies found no effect on self-reported drinking and driving (Harre and Field 1998; Klepp *et al.* 1995; Shope *et al.* 1996; D'Amico and Fromme 2002; Sheehan *et al.* 1996), the median effects of four studies found a reduction in self-reported riding with drinking drivers (Harre and Field 1998; Newman *et al.* 1992; Wilkins 2000; Sheehan *et al.* 1996). Only one study looked at crashes and found no effect (Shope *et al.* 2001). Two studies of the effectiveness of peer organization programmes were unable to provide evidence for effect (Leaf and Preusser 1995; Klitzner *et al.* 1994). Two studies of social norming programmes appeared to reduce drink driving, and led to more frequent use of designated drivers (Cimini *et al.* 2002; Foss *et al.* 2001).

Community programmes for safe driving

Although commonly used, public information programs that disseminate information about drinking and driving through the mass media have, by themselves not demonstrated any benefit in reducing alcohol-related accidents (Haskins 1985). However, broad based community prevention programmes that include public information seem to be effective (Hingson *et al.* 1996; see below).

Policies to reduce drink-driving

Summary

The drinking-driving policies that are highly effective include lowered blood alcohol concentration (BAC) levels, unrestricted (random) breath testing, administrative license suspension, and lower BAC levels and graduated licenses for young drivers Table 7.3. Whilst alcolocks can be used as a preventive measure, their use for drink driving offenders lasts for only as long as the device is fitted. There is no evidence for an effective impact from designated driver and safe drive programmes or from school-based education courses. To be effective, drink driving laws must be publicized. If the public is unaware of a change in the law or an increase in its enforcement, it is unlikely that it will affect their drinking and driving. When incorporated as part of community programmes, drink driving measures appear to have increased effectiveness.

Table 7.3 Effectiveness ratings for drink-driving countermeasures

	Effectiveness ¹	Breadth of Research Support ¹	Cost Efficiency ¹
Lowered BAC levels	+++	+++	+++
Random breath testing (RBT)	+++	++	+
License suspension	+++	++	++
Alcohol locks	+	+	+
Low BAC for youth	+++	++	+++
Graduated licensing	++	++	+++
Server training and civil liability	+	++	+
Designated drivers and ride services	O	+	++
School based education courses	?/O	+	+
Community programmes	++	++	+

¹For definitions see Table 7.1
Source: Babor *et al.* (2003) (modified).

Impact and costs of drink drive measures

The World Health Organization's CHOICE modelled two independent effects on alcohol-related traffic injuries: drink-driving laws, estimated to reduce traffic fatalities by 7% if widely implemented within a region (Shults *et al.* 2001), adjusted for the current level of implementation; and enforcement via random breath testing (RBT), estimated to reduce fatalities by a further 6-10% (Peek-Asa 1999; Shults *et al.* 2001). The model found that the full implementation of random breath testing (compared to no random breath testing) throughout the European Union (EU) prevents between 161 (EuroB countries) and 460 (EuroC countries) DALYs per million people per year, at an estimated cost of between €43 (EuroC countries) and €62 (EuroB countries) per 100 people per year (see Figures 7.11 and 7.12 at end of chapter). The model estimated that unrestricted breath testing in Europe, compared with no breath testing, can avoid 111,000 years of disability and premature death at an estimated cost of €233 million each year (adapted from Chisholm *et al.* 2004).

EDUCATION, COMMUNICATION, AND PUBLIC AWARENESS

This section discusses four areas under the heading of education, communication, training and public awareness: mass media and counter-advertising, low-risk drinking guidelines, warning labels on alcohol products and school-based education.

Mass Media and Counter-Advertising

Although most media portrayals of alcohol are in the form of commercial advertisements, public health and safety perspectives are also portrayed in the mass media. Public service announcements on television or radio, paid counter-advertisements, billboards, magazine articles, newspaper pieces, and news or feature stories on television and radio all attempt to provide information about the risks and complications associated with drinking.

Public service announcements (PSAs) are messages prepared by nongovernmental organizations, health agencies or by media organizations for the purposes of providing important information for the benefit of a particular audience. In contrast to paid advertising, PSAs depend upon donated time or space for distribution to the public. When applied to alcohol, PSAs usually deal with "responsible drinking," the hazards of driving under the influence of alcohol, and related topics. Despite their good intentions, PSAs are considered an ineffective antidote to the high-quality pro-drinking messages that appear much more frequently as paid advertisements in the mass media (see Ludwig 1994; Murray *et al.* 1996).

In many cases the messages in PSAs are intended to be particularly relevant to drinking by youth (Connolly *et al.* 1994; Holder 1994). Reviews point to the limited impact on alcohol use and alcohol-related problems from mass media interventions that use a universal strategy (Gorman 1995). Nevertheless, a Canadian study (Casiro *et al.* 1994) found that after a T.V. campaign on the dangers of alcohol consumption during pregnancy, more women concluded that drinking would put their baby at risk, and attributed this information to television. In general, there is a need for more research to find out what audiences perceive and understand from mass media campaigns (Martin 1995). Looking at how media set the public policy agenda is potentially more fruitful (Casswell 1997). For example, portrayal of alcohol issues in the news media (print, T.V. and radio) tends to be simplistic, sensational and dramatic (Gusfield 1995), and focuses on stories about individual people rather than

alcohol in its social perspective. These portrayals raise interesting questions about the way news reporting may shape public attitudes and policy about alcohol, but this area has not been extensively researched.

Counter-advertising involves disseminating information about a product, its effects, or the industry that promotes it, in order to decrease its appeal and use. It is distinct from other types of informational campaigns in that it directly addresses the fact that the particular commodity is promoted through advertising (Stewart 1997). Tactics include health warning labels on product packaging and media literacy efforts to raise public awareness of the advertising tactics of an industry, as well as prevention messages in magazines and on television. Counter-advertising may also be a module in community or school prevention programs (e.g., Giesbrecht *et al.* 1990; Greenfield and Zimmerman 1993), and be used as part of the multiple agenda of government spirits board retail systems (Goodstadt and Flynn 1993).

In most countries, the number of public service announcements and counter-advertisements on alcohol issues are at best a small fraction of the volume of alcohol advertisements (see Fedler *et al.* 1994; Wyllie *et al.* 1996) and are rarely seen on television. Moreover, the quality of counter-advertising is often poor. A study of high school students in the Moselle region in France (Pissochet *et al.* 1999) found that respondents considered alcohol risk prevention advertising to be less effective than alcohol advertising, and daily drinkers were more critical than intermittent and non-drinkers.

Media advocacy However, mass media marketing can be used to reinforce community awareness of the problems created by alcohol use and to prepare the ground for specific interventions (Casswell *et al.* 1990; Holder and Treno 1997). Education and public information approaches can be used not just to seek to persuade the individual drinker to change his or her behaviour, but also to mobilise public support for prevention approaches that have demonstrated effectiveness (Casswell and Gilmore 1989), including limiting the availability of alcohol, drinking and driving countermeasures, and regulation and harm reduction in and around drinking environments. Media advocacy can also be used to support a shift in public opinion for policy changes (Wallack *et al.* 1993), for example, the introduction of standard drinks labelling on all Australian alcohol containers (Stockwell and Single 1997).

Low risk drinking guidelines

Epidemiological research on the effects of moderate drinking on cardiovascular problems (see Chapter 5) has created political pressures in some countries to provide the public with promotional and educational material about the benefits of moderate alcohol use. Surveys in several countries have noted an increase in the number of adults who are aware of these health benefits. For example, in New South Wales, Australia, the proportion identifying health benefits increased from 28% in 1990 to 46% in 1994, with relaxation (54%) and cardiovascular benefits of moderate drinking (39%) most often mentioned (Hall 1995). In this context, official or semi-official guidelines have been adopted in a number of countries on “moderate” drinking or “low-risk drinking” (e.g., Bondy *et al.* 1999). Given the complex considerations that underlie any such guidelines, it is not surprising that the guidelines vary considerably from one country to another (Stockwell 2001). There is, at present, little research on the impact of these messages (Walsh *et al.* 1998). Furthermore, it is unclear whether such messages should be expected to lead to

decreases or increases in alcohol consumption and problems (Casswell 1993). In both Denmark (Strunge 1998) and England (Cabinet Office 2003), sensible drinking messages based on the concept of unit drinks, whilst having an impact on knowledge, have had a very limited impact on behaviour.

Warning labels on alcohol products

Warning labels on beverage containers that are required in Canada and the United States typically emphasize the potential for birth defects when alcohol is consumed during pregnancy and the danger of alcohol impairment when drinking and driving or operating machinery. Health risks are also mentioned. Some states require posted warnings of alcohol risks in establishments that serve

or sell alcohol. In the US, the appearance on labels or in advertisements of any positive health-related statement is prohibited (Alcohol and Tobacco Tax and Trade Bureau 2003). Reasons for such a ruling include (1) there are serious health risks associated with alcohol consumption, even moderate consumption; (2) the health benefits of moderate alcohol consumption do not apply universally, but only to a discrete segment of the population; (3) there are many groups of people who should abstain from, or minimize, their consumption of alcohol; (4) allowing health claims would undermine the Government warning label; and (5) explanatory statements are insufficient to clarify a misleading health claim.

A fairly extensive amount of research has been conducted in connection with mandated warning labels on alcoholic beverage containers in the United States, (Kaskutas 1995). Studies have found that a significant proportion of the population report having seen warning labels (Hilton 1993; Graves 1993; Greenfield *et al.* 1993; Kaskutas and Greenfield 1992), and there is some evidence that warning labels may increase knowledge regarding the risks of drinking and driving and drinking during pregnancy (Kaskutas and Greenfield 1992; Greenfield 1997; Greenfield and Kaskutas 1998; Greenfield *et al.* 1999; Kaskutas and Greenfield 1997), with some evidence for a dose-response relationship between pregnancy-related conversations about drinking while pregnant and the number of types of messages seen (Kaskutas *et al.* 1998). No direct impacts of warning labels on consumption or alcohol-related

US warning labels

GOVERNMENT WARNING: (1) According to the Surgeon general, women should not drink alcoholic beverages during pregnancy because of the risk of birth defects. (2) Consumption of alcoholic beverages impairs your ability to drive a car or operate machinery, and may cause health problems.

problems have been reported (MacKinnon *et al.* 2000; Grube and Nygaard 2001; Agostinali and Grube 2002). However, where there is a risk to health in consuming alcoholic beverages, and, in particular, during pregnancy, when taking medication or when driving or operating machinery, consumers should be informed about the risks, even if the evidence is limited for the impact of warning labels.

French Loi Evin

A health message must be included on all alcohol advertisements:

L'abus d'alcool est dangereux pour la santé

(Alcohol abuse is dangerous for health)

Although there is limited evidence for the impact of warning labels on alcoholic products in reducing the harm done by alcohol, European consumers should still receive accurate and consistent information on the potential of the harms done by alcohol.

School based education

The goal of most school-based alcohol education programs is to change the adolescent's drinking beliefs, attitudes, and drinking behaviours, or to modify factors such as general social skills and self-esteem that are assumed to underlie adolescent drinking.

Informational approaches Earlier school-based interventions relied solely on informational approaches and taught students about the effects and the dangers of alcohol use. Such programs have not been found to be effective (Botvin *et al.* 1995a 1995b; Hansen 1994; Tobler 1992). Although they can increase knowledge and change attitudes toward alcohol use, actual use remained largely unaffected. In addition, there is some evidence that simply providing information about the dangers of different substances may, in some cases, actually increase use (Hansen 1980 1982).

School based education

Despite many years of research, the effect sizes for most school based programmes are small and program failures are common. This suggests that, until there is more evidence for effectiveness, it is not a good use of scarce resources to invest heavily in school based education programmes.

Resistance and normative education approaches Scientific evaluations of school and university based resistance and normative education interventions have produced mixed results with regard to alcohol, with some evidence for effectiveness (Dielman 1995; Botvin and Botvin 1992; Hansen 1992 1993 1994; Ellickson 2003), including those aimed at reducing harmful alcohol consumption in university students (Baer *et al.* 1992, Marlatt *et al.* 1995, Marlatt *et al.* 2002), some of which are screening and intervention programs (Marlatt *et al.* 1998, Baer *et al.* 2001) (see below), and educational programmes based on the social norm concept (e.g. the need to conform to what is acceptable to their peers) (Mattern and Neighbors 2004;

Project Northland

Project Northland, was a school and community intervention designed to prevent or delay the onset of drinking among young adolescents in 10 communities in north-eastern Minnesota (Perry *et al.* 1993, 1996). The primary intervention was a series of school-based resistance-skills, media literacy, and normative education sessions. The program also provided parents with information on adolescent alcohol use. Task forces in some communities were involved in local policy actions such as the passage of local laws requiring responsible beverage service training. Evaluation of the project found that although it had a positive influence on alcohol knowledge and family communication about alcohol, it had no sustained impact on alcohol use (Williams *et al.* 1995; Perry *et al.* 1996; Perry *et al.* 1998).

Kypri and Langley 2003, Perkins 2002); but also criticisms of the methodology and discounting of the effectiveness (Brown and Kreft 1998; Foxcroft *et al.* 1997; Gorman 1996 1998; Paglia and Room 1999).

The Alcohol Misuse and Prevention Study (AMPS) is typical of school-based education programs that focus on pressures to use alcohol, risks of alcohol use, and ways to resist pressures to drink (Shope *et al.* 1996a 1996b). The AMPS program had positive effects on alcohol knowledge (Shope *et al.* 1992), but few effects on drinking behaviour (Shope *et al.* 1996a). Other school-based alcohol resistance skills programs have produced similar results (Botvin *et al.* 1995a; Klepp *et al.* 1995).

A good example of a well-designed study is the School Health and Alcohol Harm Reduction Project (SHAHRP study) from Australia, which aimed to reduce alcohol-related harm in secondary school students (McBride *et al.* 2004). The study found that the intervention group (which received eight to ten 40 to 60 minute lessons on skill-based activities to minimize harm at age 13 years, and twelve further skills based activities delivered over 5-7 weeks at age 14 years) consumed significantly less alcohol at 8-month follow-up, after the first phase of the intervention (31% difference). However, at final follow-up, 17 months after the intervention, the total amount of alcohol consumed by intervention and comparison had lessened to a 9% difference. After the first phase of the programme at 8-month follow-up, intervention students were less likely to consume to risky levels (26% difference), but by seventeen months after programme completion, the difference was only 4%, Figure 7.1. There was a significant difference between the study groups in the harm they reported associated with their own use of alcohol after both phases of the intervention, which was maintained 17 months after the intervention (23% difference).

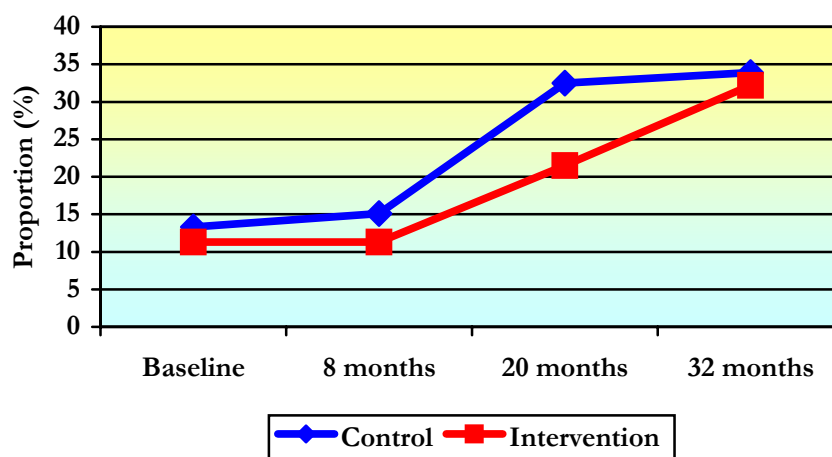


Figure 7.1 The impact of 2 education sessions (after baseline and one year later) in the intervention group compared to the control group (no education sessions) on binge drinking in 13-15 year olds. Source: McBride *et al.* (2004).

Media literacy Other school based initiatives have used media literacy efforts to teach young people to resist persuasive appeals of alcohol advertising, with some small positive effects (Austin and Johnson 1997) on resistance to such advertising (Slater *et al.* 1996) and reductions in drinking and in the number of times young people went to high-risk social environments where alcohol consumption was likely (Canzer 1996).

Midwestern Prevention Project

The Midwestern Prevention Project was implemented in 50 public schools in 15 communities in the State of Kansas (USA). A replication was conducted in 57 schools and 11 communities in another state. The intervention consisted of five components: (a) a 10-13-session school-based program with 5 booster sessions, (b) a mass media program, (c) a parent education and organization program, (d) training of community leaders, and (e) local policy changes initiated by the community organization. Differences between program and comparison schools in self-reported prevalence of monthly drinking were significant after one year (MacKinnon *et al.* 1991; Pentz *et al.* 1989) but they did not differ after 3 years (Johnson *et al.* 1990).

Family and community interventions Some programs include both individual-level education and family or community-level interventions (Werck *et al.* 2003; Bauman *et al.* 2002; Turrisi *et al.* 2001). Well-designed evaluations suggest that even comprehensive school-based prevention programs may not be sufficient to delay the initiation of drinking, or to sustain a small reduction in drinking beyond the operation of the program. (Perry *et al.* 1993 1996 1998; Williams *et al.* 1995; MacKinnon *et al.* 1991; Pentz *et al.* 1989; Johnson *et al.* 1990).

Over the longer term (more than 3 years), the Strengthening Families Programme (SFP), showed promise as an effective prevention intervention, with a number needed to treat (NNT) for three alcohol initiation behaviours (alcohol use, alcohol use without permission and first drunkenness) of 9 (Spath *et al.* 2001a; 2001b), Figure 7.2. This means that nine students have to receive the programme for one to benefit. One other study also highlighted the potential value of culturally focused skills training over the longer-term (NNT = 17 over 3.5 years for 4 + drinks in the last week) (Schinke *et al.* 2000). This means that 17 students have to receive the programme for one to benefit.

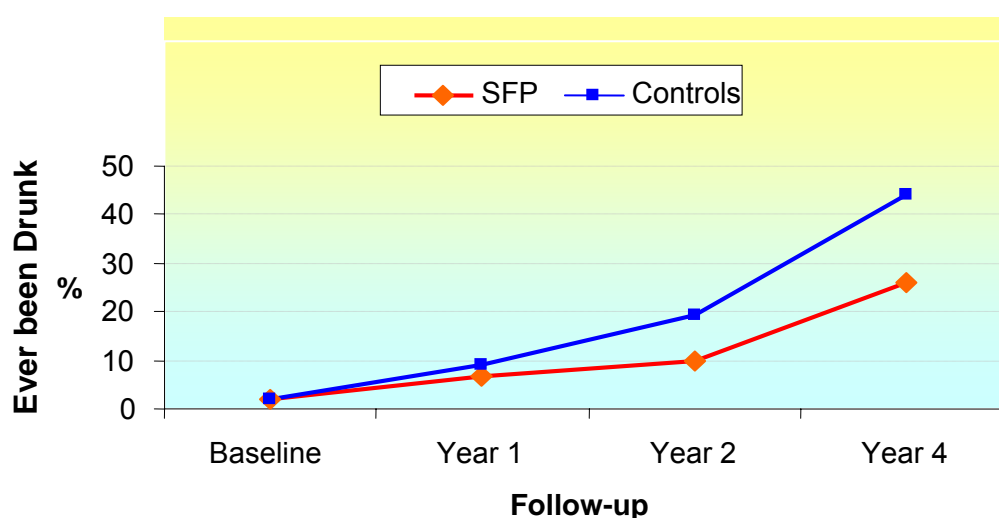


Figure 7.2 The impact of the Strengthening Families Programme on ever having been drunk. Source: Spoth *et al.* (2001a 2001b).

A **Cochrane review** of long term prevention for the primary prevention in young people found that 23 of 56 studies reviewed were ineffective in the short term, Table 7.4 (Foxcroft *et al.* 2003). The review was unable to make any firm conclusions about the effectiveness of prevention interventions in the short- and medium term.

Table 7.4 Effectiveness of primary prevention programmes for young people in the short, medium and long term. Source: Foxcroft *et al.* 2004.

Follow-up:	Partially effective	Ineffective	“Negative” effect
Short-term (1 year or less)	14	23	3
Medium-term (1-3 years)	13	19	2
Long-term (over 3 years)	3	6	0

Can the success of education programmes be improved? A number of suggestions have been made as to how the impact of school based education programmes might be improved (Marlatt *et al.* 2002, Hawks *et al.* 2002, McBride 2002; 2003; 2005). Based on the evidence of effective programmes, it is suggested that programs can be improved by:

- adopting adequate research design;
- encouraging program planners to adopt a formative phase of development that involves talking to young people and testing the intervention with young people and teachers;
- providing the program at relevant periods in young people’s development;
- ensuring programs are interactive and based on skill development;
- setting behaviour change goals that are relevant and inclusive of all young people;
- including booster sessions in later years;
- including information that is of immediate practical use to young people;
- including appropriate teacher training for interactive delivery of the program;
- making effective programs widely available; and
- adopting marketing strategies that increase the exposure of effective programs.

These improvements to school education research and program development cannot occur in isolation from the practical implementation of programs at the school level. Identification of barriers and strategies that lead to effective alcohol education are important. Evidence based implementation and practice research will enhance this development and reinforce school alcohol education as an important strategy in a community approach for dealing with youth alcohol issues. Public investment in school alcohol education should be accompanied with both research expenditure to improve practice and with adequate training to ensure quality standards are met.

Policies to support Education, Communication, Training and Public Awareness

Summary

Public service announcements, public education campaigns, and particularly those that focus on low risk drinking guidelines have limited evidence for effectiveness, although media advocacy approaches are important to gain public support for policy changes, Table 7.5. Although there is limited evidence for the impact of warning labels, there is an argument for their use in relation to consumer protection and consumer rights. Although there are individual examples of the beneficial impact of school-based education, systematic reviews and meta-analyses find that the majority of well-evaluated studies show no impact even in the short-term. A policy that fails more often than not cannot be considered an effective policy option. One family-based programme may show some promise, but has only been evaluated in a particular US context and needs a large amount of further research. There is considerable experience of what might be best practice in school-based education programmes, but currently unconvincing evidence for their effectiveness. This is not to imply that education programmes should not be delivered, since all people do need to be informed about the use of alcohol and the harm done by it, but school based education should not be seen as the only and simple answer to reduce the harm done by alcohol.

Table 7.5 Effectiveness ratings for education and public awareness

	Effectiveness ¹	Breadth of Research Support ¹	Cost Efficiency ¹
Public service messages	O	+++	++
Warning labels	O	+	+++
Alcohol education in schools	O/+	+++	+

¹For definitions see Table 7.1
Source: Babor *et al.* (2003) (modified).

Impact and costs of education type measures Due to lack of convincing evidence, the CHOICE model did not assess the impact or costs of education-based interventions.

REGULATION OF THE ALCOHOL MARKET

This section considers the impact of three different measures to regulate the alcohol market; price and tax measures; restrictions on availability; and advertising, promotion and sponsorship. Although each is considered in turn, these policy measures do not act in isolation.

Price and tax measures to reduce the harm done by alcohol

The impact of price changes on alcohol consumption and the harm done by alcohol has been more extensively investigated than any other potential alcohol policy measure (Ornstein 1980; Ornstein and Levy 1983; Godfrey 1988; Leung and Phelps 1991; Österberg 1995; USDHHS 1997; Österberg 2001).

Alcohol taxes

If alcohol taxes were used to raise the price of alcohol in the EU15 by 10%, over 9,000 deaths would be prevented during the following year and around €13bn of additional excise duty revenues would be gained.

Econometric studies are available at least from the following European countries: Austria, Belgium, Denmark, Germany, Finland, France, Ireland, Italy, the Netherlands, Norway, Poland, Portugal, Spain, Sweden, and the United Kingdom (Ahtola *et al.* 1986;

Huitfeldt and Jorner 1972; Lau 1975; Ornstein 1980; Ornstein and Levy 1983; Olsson 1991; Edwards *et al.* 1994; Österberg 1995; 2000). The price-elasticities for alcoholic beverages estimated in different studies have shown that when other factors remain unchanged, an increase in price has generally led to a decrease in alcohol consumption, and that a decrease in price has usually led to an increase in alcohol consumption, with the size of the elasticities sometimes dependent on the relative presence or absence of other alcohol policy measures (Farrell *et al.* 2003; Trolldal and Ponicki 2005).

An analysis of annual data from Australia, Canada, Finland, New Zealand, Norway, Sweden, and the United Kingdom from the mid 1950's to the mid 1980's found price elasticities of -0.35 for beer, -0.68 for wine, and -0.98 for spirits (Clements *et al.* 1997). This means that if the price of beer is raised by 10%, beer consumption would fall by 3.5%; if the price of wine was increased by 10%, wine consumption would fall by 6.8%; and if the price of spirits increased by 10%, spirits consumption would fall by 9.8%. There are differences between countries and within countries over time, in the way that alcohol consumers react to changes in the price of alcoholic beverages. This is reflected in the diversity of price elasticity values cited across studies from any given country (Österberg 1995; Chaloupka, Grossman and Saffer 2002). Reviews of demand models from 1989 and 1990 in the United Kingdom found that the demand for beer, wine, and spirits was generally price-inelastic, with the demand for wines and distilled spirits being more responsive to prices than the demand for beer (Godfrey 1989 1990). More recent estimates found price

Box 7.1: Price elasticities

Economists and econometric studies use the term **elasticity** to measure how much alcohol consumption or alcohol-related harm changes when the price of alcohol changes.

Price elastic Alcohol is described as **price elastic** when the percent change in the amount of alcohol consumed is **greater** than the percent change in price.

Price inelastic Alcohol is described as **price inelastic** when the percent change in the amount of alcohol consumed is **less** than the percent change in price.

For example, an elasticity of -2 would mean that a 10% rise in the price of alcohol would lead to a 20% fall in consumption, and would be described as 'price elastic'.

Price inelastic does **not mean** that consumption is not responsive to the price. It only means that the proportional change is less.

elasticities of -0.48 for beer consumed on premises, -1.03 for beer purchased and consumed off premises, -0.75 for wine, and -1.31 for spirits (Huang 2003).

Changes in alcohol consumption are not only determined by changes in price, but also by changes in income. The European Comparative Alcohol Study analyzed price and income (as measured by expenditure) elasticities for alcohol during the period 1960s to 1990s for 14 European countries, Table 7.6 (Lepannen *et al.* 2000).

Table 7.6 Mean elasticities of alcohol demand for selected European countries, averaged for the years 1980-1995.

Country	Elasticities	
	Price of alcohol	Income (measured as expenditure on alcohol adjusted for consumer purchasing power)
Austria	-0.026	0.930
Belgium	-0.438	1.083
Denmark	-0.573	0.414
Finland	-0.680	0.761
France	-0.308	0.520
Greece	-0.199	0.469
Ireland	-0.392	0.542
Italy	-0.087	0.890
Netherlands	-1.688	0.769
Norway	-1.308	0.879
Portugal	-0.166	0.917
Spain	-0.314	0.868
Sweden	-0.855	1.200
UK	-0.681	0.620
Mean	-0.551	0.776

Source: Lepannen *et al.* (2000).

The price elasticities indicate that demand for alcoholic beverages is more easily controllable by excise taxes in the northern European countries than elsewhere. Demand appears to be least sensitive to prices in the southern European countries. Although in the northern European countries the prices of alcoholic beverages are set at a relatively high level by taxes, the estimated value of the price elasticities indicated that the taxes were not set at their tax revenue-maximizing level even in these countries. That is, taxes could be set higher to generate further tax intakes for the governments. Between the 1960s and 1990s, the price elasticities converged separately across the northern and the southern European countries.

The similar values of the income elasticities indicate that consumers view alcoholic beverages as normal goods, and not luxuries. Between the 1960s and 1990s, the expenditure elasticities converged across all the European countries.

The price of alcohol and consumer expenditure on alcohol accounted for over half (56%) of the variation in alcohol consumption between the countries (Lepannen *et al.* 2004). However, when taking into account the different cultural characteristics of the countries themselves, price and expenditure were responsible for 11% of the variation in alcohol consumption between the countries. Finally, the variation in alcohol consumption levels decreased when prices were set at an equal level between the countries, but appeared to increase slightly when real expenditures were equalized between the countries. This shows that price is more important than expenditure in bringing about a convergence of alcohol consumption between countries.

Price and beverage preferences Examining a series of purposeful price adjustments by Systembolaget (the Swedish alcohol monopoly) throughout the years 1984 to 1993, allows the responses of consumers to changes in patterns of prices to be examined (Ponicki *et al.* 1997; Gruenewald *et al.* 2000a). Beverages were classified into “low”, “medium” and “high” quality groups by beverage type (beer, wine and spirits, based on 1990 real prices) and the impacts of changes in the real prices of these beverages within quality classes upon consumption within and between quality classes were examined. Increasing the prices within quality classes decreased sales within classes, increased sales in lower quality classes within beverage types, and increased sales in lower quality classes between beverage types. A flat price increase across all beverages led to a 1.7% drop in sales, a price increase that resulted in higher prices for higher quality beverages led to a 2.8% increase in sales, and a price increase that resulted in higher prices for lower quality beverages led to a 4.2% drop in alcohol sales.

Another natural experiment occurred in Switzerland with its reform of spirits taxes, which came into effect on 1 July 1999. Previously, the tax rate per litre of pure alcohol for domestic spirits was Swiss francs 26.00 and for foreign spirits between Swiss francs 32.00 and 58.00, according to the type of beverage and its alcohol content. The fiscal reform also liberalized the import of spirits. The result was a reduction of between 30% and 50% in the retail price of foreign spirits. Prices of domestic spirits, however, did not change. Spirits consumption increased significantly (by 28.6%) in the total sample, and specifically in young males and in individuals who were low-volume drinkers at baseline (Heeb *et al.* 2003). Consumption of alcohol overall, or of wine or beer, did not change significantly. No indication of effects of substitution was found. Alcohol-related problems also increased significantly; the significance disappeared, however, after controlling for spirits consumption, indicating that the increase of alcohol-related problems at follow-up was mainly mediated through the increased consumption of spirits.

Price effects in young people and heavy drinkers Studies have found that increases in the price of alcohol reduce the alcohol consumption of young people, with a greater impact on more frequent and heavier drinkers than on less frequent and lighter drinkers (Grossman *et al.* 1987; Coate and Grossman 1988; Laixuthai and Chaloupka 1993; Chaloupka and Wechsler 1996; Cook and Moore 2002). Beyond levels of drinking, price has also been found to influence drinking to intoxication. One large survey in the US found that a 10% increase in price would decrease the number of intoxication episodes per month by 8% (defined as consuming 5+ drinks on one occasion; Sloan *et al.* 1995). The impact of alcohol taxes differs with age,

with the impact of increasing age in youth possibly swamping the impact of price (Gius 2005).

Although alcoholic beverages appear to behave in the market like most other consumer goods, the demand for alcoholic beverages in some consumers may differ from other products because of the addictive nature of alcohol. The addictive nature of alcohol implies that an increase in the past consumption of alcohol would raise the current consumption; and thus the price elasticity in the short-term, which holds past consumption constant, would be smaller in absolute value than the price elasticity in the long-term, which allows past consumption to vary. For example, a price increase in 2004 would reduce consumption in 2004, with consumption in previous years held constant. Because of the addictive nature of alcohol, it would be expected that consumption in 2005 and in all future years would also fall. Consequently, the reduction in consumption, observed over several years (i.e., in the long term) after the price increase, would exceed the reduction observed in 2004 (i.e., in the short term). Studying the relationship between price and alcohol consumption by young adults ages 17 to 29 has found this to be the case (Grossman *et al.* 1998). Ignoring previous years' consumption (and thus the addictive aspects of alcohol) the price elasticity of demand for alcohol was -0.29. However, when previous years' consumption (and thus the addictive aspects of alcohol) was taken into account, the estimated long-term price elasticity of demand was more than twice as high at -0.65, indicating that price had a much greater influence on alcohol consumption. This also means that about one half of the reason that heavy drinking young adults do not reduce their consumption is the difficulty (costs) of overcoming the addictive nature of alcohol.

Price of alcohol and use of other drugs It is also important to know the impact of price changes of alcohol on the use of other substances. An English study of 43 polysubstance users investigated the influence of price upon hypothetical purchases of alcohol, amphetamine, cocaine and ecstasy. As the price of alcohol rose, it was found that amphetamine to some extent substituted the use of alcohol, more cocaine was used in addition to alcohol, and the use of ecstasy remained independent (Sumnall *et al.* 2004). How this translates to the real world and amongst non-poly-substance users is not known.

Effects of price on dependence and frequency of drinking Increasing the price of alcohol reduces heavier drinking (Coate and Grossman 1988; Kenkel 1993 1996; Manning *et al.* 1995), as well as alcohol dependence (Farrell *et al.* 2003).

Effects of price on the harm done by alcohol A wide range of studies have found that increasing the price of alcohol and beer reduces road traffic accidents and fatalities among people of all ages, but particularly for younger drivers (Saffer and Grossman 1987a,b; Kenkel 1993; Ruhm 1996 Chaloupka and Laixuthai 1997 Dee 1999; Mast *et al.* 1999; Dee and Evans 2001; Chaloupka *et al.* 2002 Saffer and Chaloupka 1989; Evans *et al.* 1991; Chaloupka *et al.* 1993; Sloan *et al.* 1994a; Mullahy and Sindelar 1994a). For example, a policy adjusting the US beer tax for the inflation rate since 1951 to the mid-1980s would have reduced total road traffic fatalities by 11.5 percent and fatalities among 18- to 20-year-olds by 32.1 percent (Chaloupka *et al.* 1993).

Increases in alcohol prices reduce cirrhosis death rates (Grossman 1993; Cook and Tauchen 1982), intentional and unintentional injuries (Sloan *et al.* 1994; Grossman and Markowitz 1999), workplace injuries (Ohsfeldt and Morrisey 1997) and sexually transmitted disease rates (Chesson *et al.* 2000). In the United Kingdom, it has been estimated that a 10% rise in the prices of alcoholic beverages would lead to a drop of

7.0% in male and 8.3% in female cirrhosis mortality, a drop of 5.0% for male victims and 7.1% for female victims of homicide, and a drop of 28.8% for male and 37.4% for female deaths from explicitly alcohol-involved causes (alcohol dependence, poisoning, etc.) (Academy of Medical Sciences 2004). Higher beer prices have been shown to lead to reductions in rapes and robberies (Cook and Moore 1993), homicides (Sloan *et al.* 1994), crime (Saffer 2001), child abuse (Markowitz and Grossman 1998; Markowitz and Grossman 2000), wife abuse (Markowitz 2000) violence at universities (Grossman and Markowitz 2001), and violence-related injuries (Matthews *et al.* 2005).

Impact and costs of tax measures Using the elasticities of the ECAS project (Leppänen, Sullström, and Suoniemi 2001), it is possible to estimate the effect of a tax rise that would raise the price of alcohol by 10% in each country. It should be stressed that this takes no account of any rise in smuggling or cross-border shopping due to a lack of data; in practice, policy decisions will take account of anticipated changes in these areas. Using the ECAS report analysis, it can be predicted that countries in Southern Europe would experience a drop in consumption of 2%, while the fall in Central Europe would be 5% and that in Northern Europe 8%. If these estimates are combined with the ECAS analysis of the effect of changes in consumption on health outcomes (Norström *et al.* 2001), it can be estimated that a 10% price rise would save over 9,000 deaths in the EU15 each year. This would include over 4% fewer deaths from liver disease for men (and 3% for women), 1% fewer deaths among men and women from accidents, and 5% fewer deaths among men due to homicide. Furthermore, in Finland, Sweden and Norway – where the effects of both price (on consumption) and consumption (on harm) are stronger – it is estimated there would be a 6-7% fall in suicide deaths and accidents, together with a 20% decrease in directly alcohol-related deaths for men and a 40% fall in women.

When looked at from the public accounts view, it can be roughly estimated that a 10% price rise would also give around €13bn of additional excise duty revenues within the EU.³ This is likely to be something of an overestimation, given that it takes no account of smuggling/cross-border shopping or the effect of price rises on all beverages at the same time (compared to individual beverage elasticities). Even accounting for the former and only looking at one beverage though,⁴ a detailed official UK analysis shows that spirits duties could be raised by 40% before the maximum revenue is achieved (Huang 2003). The potential for increased tax revenues even in a relatively high-tax country such as the UK was further demonstrated when beer and wine were examined – the current duties were so much lower than the maximum revenue point that it proved impossible to say exactly where this would be.

³ The tax rise from a 10% change in price is estimated from data on the share of tax in price given in the WHO Global Status Report on Alcohol 2004 (WHO 2004). The changed tax take is then calculated for each beverage separately from the tax rate per litre of pure alcohol (taken from the spirits industry organisation CEPS), changes in consumption from tax rises (above), adult per capita consumption, and adult population (both from the WHO's HFA database).

⁴ The UK estimate for spirits includes the effect of *spirits* price changes on *beer and wine* consumption (known as 'cross-price elasticities'). This has the effect of lowering the tax rate at which the maximum tax revenue is obtained in this case. However, it is extremely difficult to model the effect of simultaneous price rises in multiple beverage types, which is why the effects of beverage-specific rises are given here.

Price measures

Summary

An increase in the price of alcohol reduces alcohol consumption, hazardous and harmful alcohol consumption, alcohol dependence, the harm done by alcohol, and the harm done by alcohol to others than the drinker, Table 7.7. The exact size of the effect will vary from country to country and from beverage to beverage. There is very strong evidence for the effectiveness of alcohol taxes in targeting young people and the harms done by alcohol.

Table 7.7 Effectiveness ratings for pricing and taxation

	Effectiveness ¹	Breadth of Research Support ¹	Cost Efficiency ¹
Taxes	+++	+++	+++

¹For definitions see Table 7.1
Source: Babor *et al.* (2003).

Impact and costs

The World Health Organization's CHOICE modelled the impact of a tax on alcohol set at the current level increased by 25%, compared with no tax at all, and adjusted for the observed or expected level of unrecorded use (taken as a close proxy measure for untaxed consumption) due to illicit production and smuggling, using published price elasticities (Ornstein and Levy 1983; Babor *et al.* 2003). The model estimated that the current level of taxation plus a 25% increase can prevent between 503 (EuroB countries) and 1576 (EuroA countries) DALYs per million people per year, at a cost of between €18 (EuroC countries) and €38 (EuroA countries) per 100 people per year (see Figures 7.11 and 7.12 at the end of the chapter). The model estimated that the current level of tax with a 25% increase in the tax rate throughout Europe, compared with no tax on alcohol, can prevent an estimated 656,000 years of disability and premature death at an estimated cost of €159 million each year (adapted from Chisholm *et al.* 2004).

Restrictions on the availability of alcohol

Total or partial bans on the sale of alcohol It is clear from historical evaluations of the prohibition periods in North American and the Nordic countries (Aaron and Musto 1981; Paulson 1973) and from studies of current more limited prohibitions, that total bans on alcohol production and sales can reduce alcohol-related problems (Chiu *et al.* 1997; Bowerman 1997). However, where there has been a substantial demand for illicit alcohol, it has been met partly by illegal operators, often with associated violence in the enforcement of the illegal market (Johansen 1994; Österberg and Haavisto 1997).

Total prohibition is clearly politically un-acceptable in contemporary Europe, even if the potential for reducing alcohol problems does exist. However, that is not to say that bans on alcohol sales for specific persons in the population (e.g., children and adolescents, see below), or in specific circumstances (d'Abbs and Togni 2000) cannot be applied with demonstrated success.

Restrictions on eligibility to purchase and sell alcohol During the mid twentieth century, broad restrictions on who could purchase alcohol were fairly common. The most elaborate example of such controls was the Bratt system in Sweden, where a rationing scheme assigned a limit to each adult on how much spirits could be purchased (Tigerstedt 2000). Other types of schemes included those where drinkers convicted of violent assaults could be banned from bars and cafés.

Whilst rationing is clearly politically unacceptable in contemporary Europe, there is no doubt that general alcohol rationing schemes, such as the Bratt system in effect in Sweden until 1955 (Norström 1987) and the system in effect in Greenland from 1979 to 1982 (Schechter 1986) were responsible for reducing liver cirrhosis mortality, violence, and other consequences of heavy drinking. In Poland during the early 1980s, when alcohol rationing limited each adult to half a litre of spirits per month, episodic heavy drinking was reduced, mental hospital admissions for alcoholic psychosis fell by 60%, deaths from liver diseases dropped by 25%, and deaths from injuries by 15% (Moskalewicz and Swiatkiewicz 2000).

Sales to minors For young people, laws that raise the minimum legal drinking age reduce alcohol sales and problems among young drinkers (Grube and Nygaard 2001; Babor *et al.* 2003).

Although legal restrictions on the age at which young people may purchase alcohol vary widely from country to country, ranging typically from 16 to 21 years of age, almost all countries legally restrict these sales. A review of 132 studies published between 1960 and 1999 found very strong evidence that changes in minimum drinking age laws can have substantial effects on youth drinking and alcohol-related harm, particularly road traffic accidents, often for well after young people reached the legal drinking age (Waagenar and Toomey 2000). Many studies have found that raising the minimum legal drinking age from 18 to 21 years decreased single vehicle night time crashes involving young drivers by 11% to 16% at all levels of crash severity (Klepp *et al.* 1996; Saffer and Grossman 1987a,b; Wagenaar 1981 1986; Wagenaar and Maybee 1986; O'Malley and Wagenaar 1991; Voas and Tippet 1999). Changes in the minimum drinking age are related to changes in other alcohol-related injury admissions to hospitals (Smith 1988) and injury fatalities (Jones *et al.* 1992). One study from Denmark, where a minimum 15-year age limit was introduced for off-premise purchases, found that there was an effect in reducing teenagers' drinking, but that the drinking of those above as well as below the age limit was affected (Møller 2002).

The importance of enforcement The full benefits of a higher drinking age are only realized if the law is enforced. Despite higher minimum drinking age laws, young people do succeed in purchasing alcohol (e.g., Forster *et al.* 1994 1995; Preusser and Williams 1992; Grube 1997). In most EU countries in the ESPAD study (see Chapter 4), a majority of 15-16 year old students thought that getting any type of alcoholic beverage was fairly easy or very easy, rising to 70-95% for beer and wine (Hibell *et al.* 2004). Such sales result from low and inconsistent levels of enforcement, especially when there is little community support for underage alcohol sales enforcement (Wagenaar and Wolfson 1994 1995). Even moderate increases in enforcement can reduce sales to minors by as much as 35% to 40%, especially when combined with media and other community activities (Grube 1997; Wagenaar *et al.* 2000).

Regulating retail outlets for alcohol Alcohol can be purchased through "off-premise" or "on-premise" sales. For off-premise sales, where alcohol is consumed elsewhere, regulations can be made on the type, strength and packaging of the

alcoholic beverage and the time, costs and location of alcohol sales. For on-premise sales, where alcohol is consumed in the bar or café, regulations can specify drink sizes, disallow discount drink promotions or require on-premise staff to receive training in responsible beverage service. They may also regulate the design of the bar or café, and include specifications on such matters as food service, availability of entertainment, and other non-alcohol-related matters (see section on reducing harm in drinking and surrounding environments below).

A **licence** issued by a local or central administration is required in many countries before some types of alcoholic drinks can be sold, either on licensed premises or from off-licences. In some countries the licensing of outlets selling spirits is much stricter than regulations on the retail sale of beer and wine. There are many reasons and benefits for licensing retail sales (Lehto 1995). One is to make sure that outlets observe other regulations such as age limits and opening times. Another is to ensure that tax is collected on every drop of alcohol sold. When the system is used to restrict the number of outlets, most often the aim is to prevent health and public order problems by limiting the alcohol supply. Licensing systems have also been used to control the standard of licensed premises, for instance to deny licences to places that are perceived to encourage harmful drinking and to grant licences to outlets that appear to encourage less harmful drinking.

One means to regulate sales of alcohol is through government-owned alcohol outlets, **retail monopolies**, which still operate in parts of the US and much of Canada, as well as in the Nordic countries. Off-premise monopoly systems reduce alcohol consumption and alcohol-related problems. Studies of privatisation of sales of alcoholic beverages in the United States show substantial variations in increases in consumption (cf, Mulford, Ledolter and Fitzgerald 1992; Wagenaar and Holder 1991), with observed increases ranging between 13% and 150% (Wagenaar and Holder 1995). When Finland changed from selling beer only in government monopoly stores to selling it also in grocery stores in 1968, alcohol consumption rose by 46% in the following year, alcohol problem rates increased (Mäkelä *et al.* 2004), and drinking among 13 to 17-year-olds increased (Valli 1998). Noval and Nilsson (1984) found that total alcohol consumption in Sweden was substantially higher when medium-strength beer could be purchased in grocery stores between 1965 and 1977, rather than only in state monopoly stores.

Number of retail outlets/outlet density Outlet density refers to the number of outlets available for the retail purchase of alcohol. The smaller the number of outlets for alcoholic beverages, the greater the difficulty in obtaining alcohol, a situation that is likely to deter alcohol use and problems (Gruenewald *et al.* 1993). This can be seen in practice in Finland, Sweden, Britain and North America.

Finnish studies have found an overall impact on alcohol consumption from changes in the number of outlets (Kuusi 1957; Lehtonen 1978; Mäkinen 1978). The most dramatic change was observed in 1969, when beer up to 4.7% alcohol was allowed to be sold by grocery stores, and it also became easier to get a restaurant license. The number of off-premise sales points increased from 132 to about 17,600, and on-premise sales points grew from 940 to over 4000 (Österberg 1979). In the following year, alcohol consumption increased by 46%. In the following five years, mortality from liver cirrhosis increased by 50%, hospital admissions for alcoholic psychosis increased by 110% for men and 130% for women, and arrests for drunkenness increased by 80% for men and 160% for women (Poikolainen 1980).

Swedish studies have also found an overall impact on alcohol consumption and alcohol-related harm from changes in the number of outlets (Noval and Nilsson 1984;

Hibell 1984). A time-series analysis found that motor vehicle accidents were significantly reduced in three of four age groups when the right to sell 4.5% beer in groceries was retracted; there was a significant fall in hospital admissions for alcohol-specific diagnoses among those aged under 20 years, but no effect on assaults, suicides and falls (Ramstedt 2002).

However, **Norwegian studies** of the effects of opening wine and spirit outlets in places where beer was already available found a shift away from other beer and home produced spirits, with little effect on overall consumption. This suggests that, where there is already some availability of alcohol, the effects on total consumption of changes in the number of off-sale stores selling one or another type of beverage are minor (Mäkelä *et al.* 2002).

Recent years have seen the transformation of the night-time economy in **British cities** and towns (Hobbs *et al.* 2003; Chatterton and Hollands 2003), with older pubs being replaced by large branded drinking warehouses run by national or international chains. In Manchester City Centre, for example, the capacity of licensed premises increased by 240% between 1998 and 2001, whilst the number of assaults reported to the police increased by 225% between 1997 and 2001 (Hobbs *et al.* 2003).

North American studies have looked at the association of outlet density with rates of drinking driving collisions (Blose and Holder 1987; Gruenewald *et al.* 1993). Four studies report no impact of outlet density on drinking-driving or collision measures (Gruenewald and Ponicki 1995; Kelleher *et al.* 1996; Meliker *et al.* 2004; Lapham *et al.* 2004). However, a larger number of studies (eight) have reported a significant impact of outlet density on alcohol consumption and drinking driving collision (Scribner, MacKinnon and Dwyer 1994; Gruenewald *et al.* 1996; Gruenewald *et al.* 1999; Gruenewald, Johnson and Treno, Jewell and Brown 1995; 2002; LaScala *et al.* 2001; Treno, Grube and Martin 2003; Escobedo and Ortiz 2002; Cohen, Mason and Scribner 2002), and assaults, particularly in high population density areas (Gruenewald *et al.* 1996). On balance, the research indicates that increasing numbers of outlets will increase alcohol-related collisions and fatalities (see Mann *et al.* 2005 for a more detailed description). Outlet density has also been associated with an increased risk of pedestrian injury collisions (LaScala *et al.* 2000), and violent assaults (Alaniz *et al.* 1998; Stevenson *et al.* 1998; Zhu *et al.* 2004).

The distribution of alcohol-related crashes (single-vehicle night-time crashes) is also related to the distribution of on-premise outlets and rates of these crashes decrease with greater distance from concentrated areas (Gruenewald *et al.* 1996). Further, greater outlet concentrations have a greater impact on alcohol-related crashes in areas with greater amounts of highway traffic (Gruenewald and Johnson 2000), and in lower income areas (LaScala, Gruenewald and Gerber 2000).

Research has examined the associations between outlet density and measures of student and underage drinking. Outlet density has been found to be closely related to heavy drinking and drinking-related problems among college students (Weitzman *et al.* 2003); other associations were found for the number of commercial sources of alcohol and binge drinking and drinking in inappropriate places for students age 16 to 17 years (Dent *et al.* 2005).

The impact of changes in availability will depend on local circumstances (Abbey, Scott and Smith 1993). Thus, whereas changes occurring across a country have an impact (Gruenewald, Ponicki and Holder 1993; Wagenaar and Holder 1996), when changes in availability are more local, there may be no impact (Gruenewald *et al.* 2000b). In the first case, it is difficult to avoid the effects of reduced availability. In the

local case, it is possible to travel outside the local geographic area to obtain alcohol. Further, equivalent reductions in local areas can have different effects. A 10% reduction in the number of outlets in high density areas will have negligible effects on the distances between people and outlets. A 10% reduction in the number of outlets in low density areas may result in the elimination of the only outlets easily accessible by drinkers.

In sum, outlet density is, in general, positively associated with alcohol consumption and alcohol-related problems: the higher the density, the higher consumption and problems will likely be, (Her *et al.* 1998; 1999), Figure 7.3, although the extent to which changes in densities over time affect rates of problem outcomes is not always certain (Gorman *et al.* 2001).

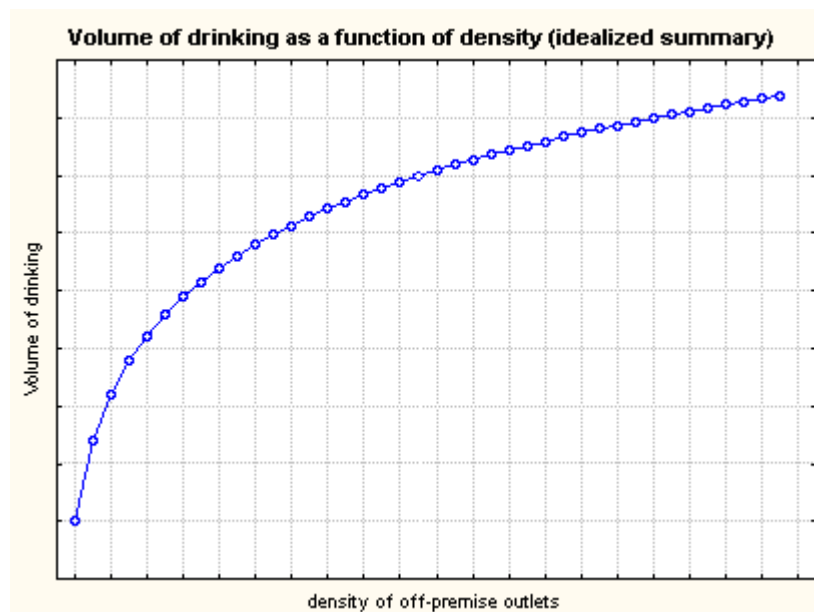


Figure 7. 3 Illustration of the relationship between volume of drinking as a function of outlet density (Source: Her *et al.* 1999a)

Hours and days of retail sale A number of studies have indicated that although changing either hours or days of alcohol sale can redistribute the times at which many alcohol related crashes and violent events related to alcohol take place (e.g., Smith 1988; Nordlund 1985), it does so at the cost of an overall increase in problems. Around-the-clock opening in Reykjavik, for instance, produced net increases in police work, in emergency room admissions and in drink-driving cases. The police work was spread more evenly throughout the night, but this necessitated a change in police shifts to accommodate the new work (Ragnarsdottir *et al.* 2002). A study in Western Australia showed that extending opening hours from midnight to 1.00am increased violent incidents at the later night venues by 70% (Chikritzhs, Stockwell and Masters 1997; Chikritzhs and Stockwell 2002), Figure 7.4. The increased problems associated with the late trading venues appeared to result from increased alcohol consumption rather than increased opportunity for crime to occur, since there was no apparent difference between the two groups after controls for alcohol sales. The blood alcohol levels (BALs) of drivers in road crashes, who had been drinking at the extended trading premises, were significantly higher than those drinking at the control premises. Similar studies have also found that assaults at licensed premises are much more likely to occur during extended trading periods, with the most frequent time being midnight to 3am (Briscoe and Donnelly 2003a).

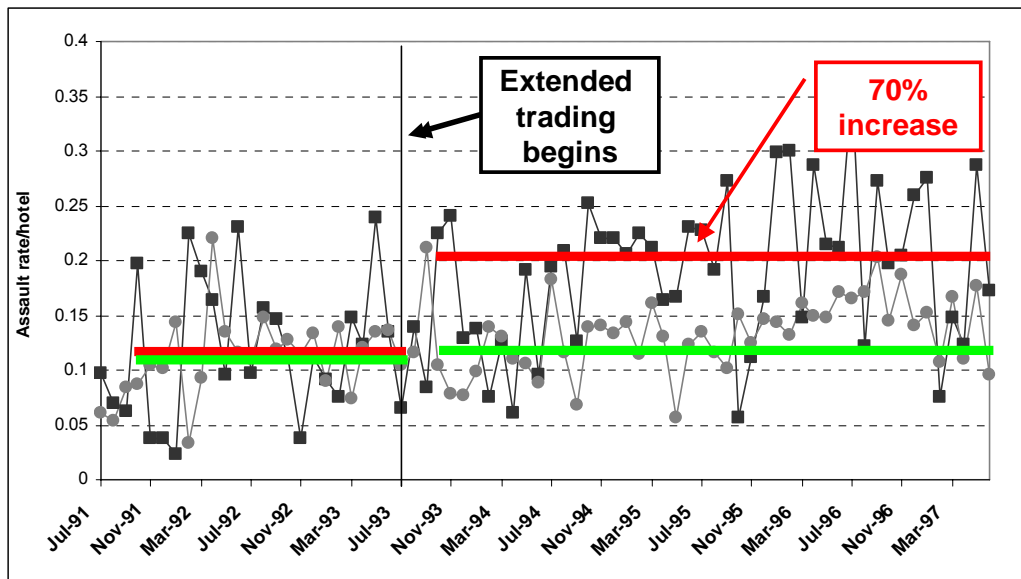


Figure 7.4 Assault rates for hotels that closed at 1 am [■] and those that closed at midnight [●] Perth, WA. Source: Chikritzhs and Stockwell (2002).

A study in Sweden (Norström and Skog 2001 2002 2005) found a net 3.6% increase in alcohol sales with Saturday opening of government alcohol stores, although the changes in harm were not big enough to be significant. The Saturday opening occurred at a time when alcohol was more readily available from other sources, including restaurants and bars, groceries (up to 3.5% alcohol concentration) and travellers' imports.

There is also evidence that restricting days and hours of sale reduces problems. In the 1980s Sweden re-instituted Saturday closing for spirits and wine off-premise sales after studies showed that Saturday sales were associated with increased rates of domestic violence and public drunkenness (Olsson and Wikström 1982). In 1984, Norway reintroduced Saturday closing, with a resultant decrease in domestic violence and disruptive intoxication (Nordlund 1985).

Restricting availability

Summary

Raising and implementing a minimum age of purchase for alcohol, and reducing the availability of alcohol through restrictions on the number and density of outlets and the days and hours of sale all reduce alcohol related harm, Table 7.8.

Table 7.8 Effectiveness ratings for restrictions on the availability of alcohol

	Effectiveness ¹	Breadth of Research Support ¹	Cost Efficiency ¹
Minimum drinking age	+++	+++	++
Government retail outlets	+++	+++	+++
Number of outlets	++	+	+++
Density of outlets	++	++	+++
Hours and days of sale	++	+++	+++

¹For definitions see Table 7.1
Source: Babor *et al.* (2003) (modified)

Impact and costs

The World Health Organization's CHOICE modelled reduced access to and availability of alcohol through estimating what would happen if alcohol could not be purchased for a 24-hour period at the week-end (although not politically acceptable across contemporary Europe, this option was chosen by the WHO team, based on Scandinavian data, which has been shown to reduce consumption and alcohol-related harm (Leppanen 1979; Nordlund 1984; Norström and Skog 2003)). Based on these studies, a modest reduction of 1.5-3.0% in the incidence of hazardous drinking and 1.5-4.0% in alcohol-related traffic fatalities was modelled. If implemented throughout the European Union, the model estimated that such an intervention can prevent between 251 (EuroA countries) and 689 (EuroC countries) DALYs per million people per year, at a cost of between €12 (EuroC countries) and €23 (EuroA countries) per 100 people per year (see Figures 7.11 and 7.12 at the end of the chapter). Although it is not known for how long the effects might last, the model estimated that such an intervention throughout Europe can prevent an estimated 123,000 years of disability and premature death at an estimated cost of €98 million each year (adapted from Chisholm *et al.* 2004).

Alcohol advertising, promotion and sponsorship

Introduction

Beverage alcohol is prominent among the many branded consumer goods that young people, in particular, increasingly use as a way of signalling their identity and place in the world. The producers and marketers of beverage alcohol, many of whom are global players (Babor *et al.* 2003, Jernigan 1997), use sophisticated promotional practices to target specific groups such as those starting to drink, regular young drinkers and established young drinkers (Academy of Medical Sciences 2004). This marketing utilizes multiple channels (youth radio, television, events, websites, mobile phones) and diverse modalities (advertising, sponsorship, branding) (Jernigan and O'Hara 2005). Such marketing of alcohol to young people is at the forefront of what is termed post-modern marketing (Cooke *et al.* 2004; Jernigan and O'Hara 2005). Advertising and branding are crafted to mirror and express dominant representations of youth culture and lifestyles (Klein 1999; Jackson *et al.* 2000). Promotion is never static, even in established markets, as new cohorts of young people become available as targets for marketing activity on a continual basis as they mature (Saffer 2002).

A total marketing strategy has five steps: product development, pricing, physical availability, market segmentation and targeting, and advertising and promotion campaigns (Cowan and Mosher 1985; Kotler 1992). This section will consider the impact of each of the five marketing steps on alcohol consumption, with the greater discussion on the impact of advertising and promotion campaigns, and will discuss some aspects of regulating marketing practices, and in particular self-regulation.

New product development

New product development has been particularly active since the 1990s (Jackson *et al.* 2000; Mosher and Johnsson 2005), and started with designer drinks characterised by brightly coloured and innovative packaging, delivering the product benefits of strength, flavour and portability, such as bottled ciders and fortified fruit wines. The boom in designer drinks lasted until the mid-1990s, when a new range of alcoholic soft drinks, which became known as 'alcopops', emerged. Alcopops were then superseded by 'pre-mix cocktails' (blends of spirits, soft drinks and other unique flavourings that are not readily concocted by consumers themselves), and a trend towards mixing high energy soft drinks (such as Red Bull) with spirits (such as vodka). A development of this trend has been the introduction of 'ready-to-drink' alcoholic energy drinks that are sold on the basis of their stimulant properties. These drinks contain a blend of vodka, caffeine, glucose and taurine and have an average alcohol content of 5.4%. Another type of product – strong spirits designed to be consumed in one mouthful from small 'shot' glasses - is becoming increasingly popular. Brands include 'Aftershock' and 'Goldshlager', and are chosen by young drinkers because their strength gives an immediate hit, and their strong flavours (for example cinnamon), brand names and packaging have created associations with daring behaviour (see Hastings *et al.* 2005).

Whether they be wine coolers, (Goldberg *et al.* 1994), designer drinks (McKeganey *et al.* 1996), or alcopops (Barnard and Forsyth 1998), studies of young people's attitudes and behaviour in several countries have documented that such new products are the drinks of choice of young people and can contribute both to heavier drinking and to lowering the age of onset of drinking. In some instances, these products seem to be competing directly with the youth market for illegal drugs (Jackson *et al.* 2000).

The brand imagery of designer drinks - in contrast to that of more mainstream drinks - matched many 14 and 15 year olds' perceptions and expectations of drinking, with consumption of designer drinks tending to be in less controlled circumstances and associated with heavier alcohol intake and greater drunkenness (Hughes *et al.* 1997). Data from the Health Behaviour in School-aged Children study found that in Wales, alcopops consumption matched the entire increase in weekly drinking of alcohol between 1994 and 1996 among 11 and 12 year olds, half the increase for 13 and 14 year-olds, and most of the increase for 15 and 16 year old girls (Roberts *et al.* 1999). Swedish surveys have found that alcopops and sweet ciders accounted for more than half the recorded increase in alcohol consumption among 15 and 16 year old boys between 1996 and 1999, and two-thirds of the increase in consumption among girls, at a time when alcohol consumption among Swedish adults remained stable (Romanus 2000).

Industry representatives do not deny the importance of new products designed to reach "new drinkers" or "entry-level drinkers" or some similar term: "*No matter where in the world they are drunk, and at what kind of occasion, there is no doubt that FABs (flavoured alcoholic beverages) are consumed by younger drinkers. The*

combination of packaging, taste and alcoholic content gives them little appeal to older drinkers” (Euromonitor 2004; 6, Section 22.15).

Pricing

The impact of price on consumption has been discussed above. There has been a considerable trend towards popular drinking venues offering promotional deals and ‘happy hours’ (temporary price-cuts) on products regularly consumed by young drinkers (see Hastings *et al.* 2005). Examples include: a never ending vodka glass (purchase one glass of vodka and refill it as often as you like); buy-one-drink and get-one-free happy hours, and cheap deals on popular drinks on particular nights of the week. Alcohol price promotions are associated with increased binge drinking (Kuo *et al.* 2003)

Availability

The impact of availability on consumption has been discussed above. Alcohol advertising can also take place at the **point of purchase**, including exterior and interior advertisements for alcoholic beverages; alcohol-branded functional objects provided free to retailers (e.g., counter change mats with an alcohol company logo); beer placement (e.g., single cans or bottles chilled in buckets near checkout locations); and the presence of low-height advertisements (i.e., advertisements placed in the sight line of children and adolescents as opposed to adults) (CDC 2003). For non-drinkers aged 12-13 years, exposure to in-store beer displays are predictive of drinking onset by age 14-15 years (Ellickson *et al.* 2005).

Market segmentation and targeting

Research in the United States shows that alcohol companies have placed significant amounts of advertising where youth are more likely per capita to be exposed to it than adults (Jernigan *et al.* 2005). In 2002 in the US, underage youth saw 45% more beer and ale advertising, 12% more distilled spirits advertising, 65% more low-alcohol refresher advertising, and 69% less advertising for wine than persons 21 years and older (Jernigan *et al.* 2004). Girls aged 12 to 20 years were more likely to be exposed to beer, ale, and low-alcohol refresher advertising than women in the group aged 21 to 34. Girls' exposure to low-alcohol refresher advertising increased by 216% from 2001 to 2002, while boys' exposure increased 46%.

Magazines are the most tightly targeted of the measured media. Two studies to date have looked at alcohol advertising in this medium. Following on research suggesting that cigarette brands popular among youth ages 12 to 17 were more likely than other brands to be advertised in magazines (King *et al.* 1998), Sanchez *et al.* (2000) selected a convenience sample of 15 magazines, 11 with the highest youth readership (greater than 1.9 million readers) and 4 with the lowest youth readership (less than 0.8 million), and assessed the volume of influence by counting advertising pages for alcohol and tobacco in each magazine. The authors found a relationship between the size of youth readership and alcohol and tobacco advertisements, with magazines with more youth readers containing more alcohol and tobacco advertisements. Similar findings were made by Garfield *et al.* (2003), who found that after adjustment for other magazine characteristics, the advertisement rate ratio was 1.6 more times for beer and spirits for every additional one million adolescent readers. Wine industry advertising was not associated with adolescent readership, Figure 7.5.

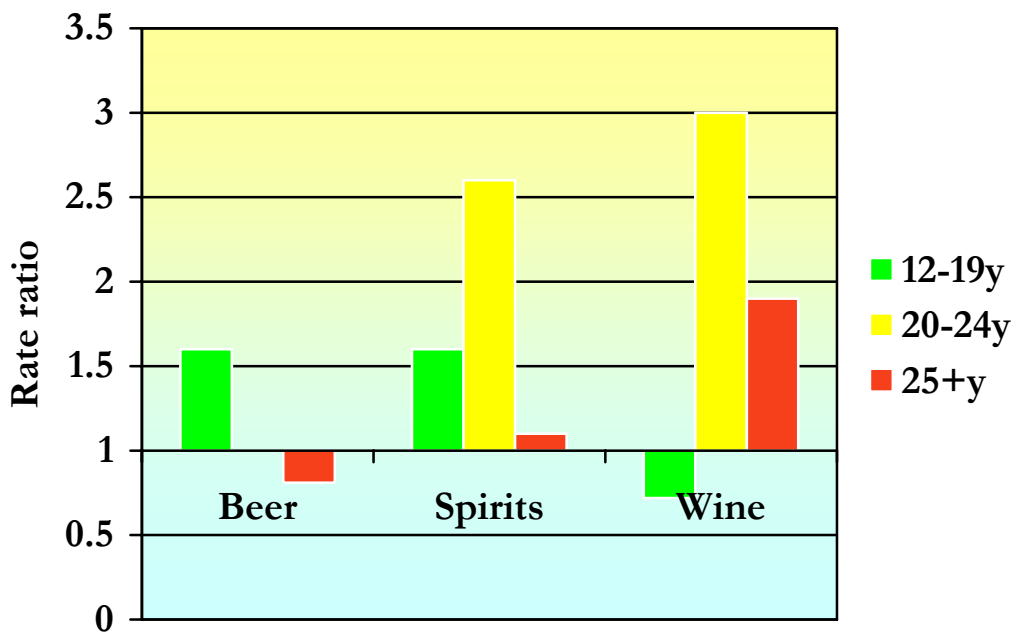


Figure 7.5 Magazine readership and alcohol advertisements. The advertisement rate ratio for every additional 1 million adolescent readers. For example, a US magazine that has 1 million more readers aged 12-19 years than another US magazine will have 1.6 times the number of beer and spirits advertisements. Source: Garfield *et al.* (2003).

Advertising and promotion campaigns

Television portrayal of alcohol use has been given a lot of attention. When people are seen drinking on television they seem to be drinking alcohol most of the time (Brown and Witherspoon 2002). Pendleton *et al.* (1991), for example, found that every 6.5 min a reference to alcohol was made in their sample of 50 programmes on British television. Especially in fictional series the consumption of alcohol was prominently present. Furnham *et al.* (1997) concentrated on the portrayal of alcohol and drinking in six British soap operas and concluded that 86% of all programmes contained visual or verbal references to alcoholic beverages. More alcohol was consumed than any other kind of drink, but the sample of programmes almost never referred to the hazards of alcohol consumption.

Content analyses of portrayals of alcohol use on television suggest that incidences of drinking occur frequently and that these portrayals present drinking as a relatively consequence-free activity (Christenson *et al.* 2000; Grube 1993; Mathios *et al.* 1998; Wallack *et al.* 1990). Television characters who drink tend to be “high status” characters who are wealthy, successful, attractive, and in senior-level occupations. Their drinking is often associated with happiness, social achievement, relaxation, and camaraderie (Hundley 1995; Wallack *et al.* 1990).

Content analyses of the appeals used in alcohol advertisements suggest that drinking is portrayed as being an important part of sociability, physical attractiveness, masculinity, romance, relaxation and adventure (Grube 1993; Finn and Strickland 1982; Madden and Grube 1994). Many alcohol advertisements use rock music, animation, image appeals, and celebrity endorsers, which increase their popularity with underage television viewers (Aitken 1989; Grube 1993; Jones and Donovan

2001; Martin *et al.* 2002; Waiters *et al.* 2001). Not surprisingly, then, alcohol commercials are among the most likely to be remembered by teenagers and the most frequently mentioned as their favourites (Aitken 1989; Aitken *et al.* 1988; Aitken *et al.* 1988; Grube 1993).

A number of studies have attempted to understand the process by which exposure to alcohol advertising and incidental portrayals of drinking on television and music videos (DuRant *et al.* 1997; Robinson *et al.* 1998) influence alcohol-related beliefs and behaviours in children and adolescents. Aas and Klepp (1992), Atkin (1990), and Austin and Meili (1994) have argued that alcohol use is a learned behaviour, part of the adolescent socialization process. They contend that adolescents, particularly those who have not yet begun to experiment personally with alcohol, actively and deliberately seek information about alcohol from cultural sources as well as family and peers. One of the primary sources is television, which may present only a distorted view of the realities of alcohol use (Atkin 1990; Austin and Nach-Ferguson 1995; Christenson *et al.* 2000; Grube 1993; Kelly and Donohew 1999; Mirazee *et al.* 1989; Wallack *et al.* 1990).

High school boys who are heavier television viewers drink more than lighter viewers (Tucker 1985; Atkin 1990), although this is not the case for all programme viewing (Klein *et al.* 1993). Heavier viewers are more likely than lighter viewers to agree that “people who drink are happy” and “you have to drink to have fun at a sporting event” (Neuendorf 1985). More recently, it was found that television viewing was related to initiation of drinking over an 18-month period (Robinson *et al.* 1998) Each 1-hour increase in television viewing at baseline was associated with a 9% increased risk for initiating drinking during the following 18 months.

Music and music videos An analysis of music that is popular with youth found that 17% of lyrics across all of the genres contained references to alcohol (Roberts *et al.* 1999). Alcohol was mentioned more frequently in rap music (47%) than in other genres, such as country-western (13%), top 40 (12%), alternative rock (10%), and heavy metal (3%). A common theme is getting intoxicated or high, although drinking also is associated with wealth and luxury, sexual activity, and crime or violence. As with television and film, consequences of drinking are mentioned in few songs and antiuse messages occur rarely. Product placements or brand name mentions occurred in approximately 30% of songs with alcohol mentions and are especially common in rap music (48%). From 1979 to 1997, rap music song lyrics with references to alcohol increased fivefold (from 8% to 44%); those exhibiting positive attitudes rose from 43% to 73%; and brand name mentions increased from 46% to 71% (Herd 2005). There were also significant increases in songs mentioning champagne and liquor (mainly expensive brand names) when comparing songs released after 1994 with those from previous years. In addition, there were significant increases in references to alcohol to signify glamour and wealth, and using alcohol with drugs and for recreational purposes. The findings also showed that alcohol use in rap music was much more likely to result in positive than negative consequences.

A similar pattern is found for music videos. DuRant *et al.* (1997) found that rap music videos contained the highest percentage of depictions of alcohol use, whereas rhythm and blues videos showed the least alcohol use. Additionally, alcohol use was found in a higher proportion of music videos that had any sexual content than in videos that had no sexual content. Both the content, which has been shown to glamourize the use of alcohol, and the advertisements surrounding the music videos have a potential to make drinking alcohol more enticing to young viewers.

Use of alcohol by adolescents has been associated with higher levels of music video exposure (Robinson *et al.* 1998; Durant *et al.* 1997; Brown and Witherspoon 2002). Robinson *et al.* (1998) found a 31% increased risk of drinking initiation over 18 months for each 1-hour increase in watching music videos. Another study of the effects of popular music videos on adolescent risk behaviour found a positive association between exposure to rap music videos and an increased likelihood of alcohol use among African American female adolescents (Wingood *et al.* 2003). Results of a 12-month follow-up showed that adolescents with a greater exposure to rap music videos were 1.5 times more likely to have used alcohol than were adolescents with less exposure to rap music videos. A Dutch study examined the association between music video viewing and the amount of drinking in adolescents (Van Den Bluck and Beullens 2005). The results showed that the quantity of alcohol consumed while going out in February 2004 was related to the adolescents' overall TV viewing and their music video exposure a year earlier. Even after controlling for gender, school year, and drinking in 2003, these results remained significant.

Films Content analyses indicate that alcohol is shown or consumed in most films. Thus, 92% (185) of the 200 most popular US movies for 1996–1997 contained images of drinking (Roberts *et al.* 1999). Underage use of alcohol occurred in approximately 9% of these films. In general, drinking was associated with wealth or luxury in 34% of films that contained alcohol references and pro-use statements or overt advocacy of use occurred in 20% of these films. Statements that advocated against drinking appeared in only 9% of the films with alcohol references. In all, 57% of films with alcohol references portrayed no consequences to the user at all. Similar findings have emerged from other content analyses (Everett *et al.* 1998). Surprisingly, an analysis of children's animated feature films found that 47% of them depicted alcohol or drinking (Thompson and Yokota 2001). None of these animated films contained an overt health warning about alcohol use and good or neutral characters accounted for most of the drinking portrayals.

In terms of images of drinkers, a content analysis of 100 films from 1940 to 1989 compared drinkers with non-drinkers; drinkers were depicted more positively than non-drinkers (McIntosh *et al.* 1999). Specifically, drinkers were rated as having a higher socio-economic status, being more attractive, having more romantic and sexual involvements, and being more aggressive than non-drinkers. These films, however, presented negative consequences associated with drinking, such as death and loss of loved ones, on an equal basis with positive consequences, such as wealth and romance. A similar analysis of films produced from 1906 to 2001 found alcohol use to be portrayed predominantly in a normalized fashion, compared with demonized portrayals of illicit drugs, such as cannabis (Cape 2003).

Studies of the effects of exposure to depictions of drinking in films on youth are rare (Thompson 2005). In one study, college students were exposed to one of two versions of *A Star is Born*; one depicted the negative consequences of drinking for the lead character, whereas the other version had the negative consequences deleted (Bahk 1997; 2001). Viewing the version that had deleted scenes led to more favourable attitudes toward drinking and to stronger intentions to drink. In a similar study, college students were exposed to a series of film clips that depicted negative consequences of spirits consumption, positive consequences, or a control condition with no drinking (Kulick and Rosenberg 2001). Results indicated that participants who viewed the clips that showed positive consequences of drinking had significantly higher positive alcohol expectancies compared with controls. The control group and the group that viewed the clips that showed negative consequences did not differ in their intentions to drink spirits in the next week. Other research showed a positive correlation between parental restrictions on non-childhood movies and a decreased

likelihood of adolescent drinking. Dalton *et al.* (2002), for example, found that the prevalence of drinking among middle school students decreased as parental restrictions that were placed on viewing films increased. The prevalence of having tried alcohol was 46% for youth with no parental viewing restrictions, 16% for youth with partial restrictions, and 4% for those with complete restrictions. These prevalence rates held constant, even after controlling for other variables, such as student and parenting characteristics.

Paid placements Paid placements of products in films, television, books, and video games is another way to embed alcoholic beverages in the daily lives of young people. Media placement decisions are the result of extensive market research and the use of standard market research databases to assess the demographic profiles of the audiences for various media vehicles, as well as the effectiveness of such vehicles in delivering target audiences to firms interested in placing advertising in them (Jernigan and O'Hara 2005).

Internet The rapid rise of information technology and, in particular, the Internet has given manufacturers a new promotional opportunity. Sophisticated web sites have been created using technology to produce interactive arenas with impressive graphics and eye-catching animation. Research on alcohol portrayals on the Internet has focused on youth access, exposure to alcohol marketing, and the potential attractiveness of commercial alcohol web sites to youth. Research has not addressed the content of non-commercial web sites that focus on alcohol products or drinking cultures. Similarly, no study has addressed the potential effects on consumption by youth of exposure to alcohol portrayals and promotion on the Internet. The Center for Media Education (quoted in Grube and Waiters (2005)) found that commercial alcohol web sites are easily accessible to youth, and are often accessed from search engines through nonrelated key word searches for games, entertainment, music, contests, and free screensavers. Content analyses of web sites that are registered to large alcohol companies revealed that young drinkers are targeted through a glorification of youth culture that offers humour, hip language, interactive games and contests, audio downloads of rock music, and community-building chat rooms and message boards. Overall, these sites were found to promote alcohol use. Only a handful of them included any information on the harm done by alcohol.

Grass roots and viral Grass-roots level marketing has also increased during the 1990s through the use of technologies such as the Internet, the adoption of racial, ethnic, and other holidays and celebrations and the expansion of sponsorship from sporting events to popular music concerts as alcohol marketing opportunities (McBride and Mosher 1985:143; Alaniz and Wilkes 1998), to events in which alcohol is often a central part of the activities, thereby embedding products in young people's lifestyles and daily practices (Aaker 1996; Fleming and Zwiebach 1999). Viral marketing techniques are also popular to encourage users to bring their friends to Internet sites, including features that permit users to send e-mail and mobile phone text messages to friends (Cooke *et al.* 2002). Little research has been done to date on the impact of such marketing on young people.

Sports sponsorship Commercial sponsorship has expanded greatly since the 1980's, led by the tobacco industry, but with the alcohol industry in second place (Meenaghan 1991, Meerabeau *et al.* 1991). As a result, alcohol sponsorship has become common across the world in all the key areas of youth culture: music, sport, dance, film and television (see Table 7.9).

Sponsorship brings a number of potential benefits to the sponsor. It can provide a means of avoiding regulations on direct advertising (Meerabeau *et al.* 1991). It is an

inexpensive form of advertising which can easily reach favoured market segments (young men are both the keenest sports fans and the heaviest drinkers), and these consumers are less critical of it than traditional forms of advertising. Further, sponsorship of large international sports events can allow a company's brand to cross borders into countries where direct alcohol marketing may be severely restricted or even banned.

Table 7.9 Examples of alcohol sponsorship activity.

Company	Sponsored Event	Country
Athinaiki Zithopiiia (Athenian Brewery S.A.)	Athens 2004 Olympic Games	Greece
Steinlager	All Blacks (http://www.steinlager.com/allblacks/)	New Zealand
Amstel	UEFA Champion's League (http://www.uefa.com/competitions/ucl/)	Europe
McDowell brands	Football events and teams, and the Derby (http://www.mcdowellindia.com/frame_events.html)	India
Bailey's	'Sex and the City'	UK
Anheuser-Busch	Olympic Games and the United States' three Olympic Training Centres (Van Komen 2000)	USA
Smirnoff Vodka	Night-club events and linked radio shows which are branded as 'The Smirnoff Experience' (http://www.smirnoffexperience.com/intro.htm)	Global

Source: Cooke *et al.* (2002)

Research on the effects of sponsorship is limited, and much more is needed. Sponsorship produces higher levels of awareness than advertising amongst both users and non-users of the brand being examined (Hoek *et al.* 1997). For non-drinkers aged 12-13 years, exposure to beer concession stands at sporting events displays is predictive of drinking onset by age 14-15 years (Ellickson *et al.* 2005). Further, attendance at family entertainment venues associated with sporting events is predictive of alcohol consumption amongst 12-13 year olds (Thomsen *et al.* 2004).

Changing expectancies, beliefs, and attitudes

Social norms reflect one's beliefs about both the normality and appropriateness of particular beliefs and behaviours and, as a result, often create pressure to conform and behave in a particular way (Aas and Klepp 1992; Austin and Johnson 1997a; 1997b; Austin and Knaus 2000; Austin and Meili 1994; Austin and Nach-Ferguson 1995; Thomsen and Rekve 2004). In most cases, this pressure is internal and reflects what we think others will expect of us in particular situations. As suggested by social cognitive theory, social norms are often learned through observation and vicarious experiences. Teenagers, for example, who see other teenagers drink – on

television or in a real-life setting – may come to believe that all teenagers drink, in turn creating pressure to conform to this normative standard (Aas and Klepp 1992). The problem is that teenagers tend to overestimate the frequency of drinking by other teenagers, thus creating beliefs and related pressures that are not consistent with reality (Aas and Klepp 1992).

For children and adolescents who have not yet begun to drink, **expectancies** are influenced by normative assumptions about teenage drinking as well as through the observation of drinking by parents, peers, and models in the mass media (Aas 1993; Ary *et al.* 1993; Cumsille *et al.* 2000; Curran *et al.* 1997; Grube and Wallack 1994; Jackson *et al.* 1999; Webb *et al.* 1996). A growing body of research has linked exposure to portrayals of alcohol use in the mass media with the development of positive drinking expectancies by children and adolescents (Andsager *et al.* 2002; Austin and Johnson 1997a; 1997b; Austin and Knaus 2000; Austin and Meili 1994; Aitken 1989; Aitken *et al.* 1988; Austin and Knaus 2000; Austin and Meili 1994; Austin and Nach-Ferguson 1995; Austin *et al.* 2000; Dunn and Yniguez 1999; Grube and Wallack 1994; Kelly and Edwards 1988; Kotch *et al.* 1986; Martin *et al.* 2002; Hill and Caswell 2001).

Many studies suggest that **portrayals of incidental drinking** in entertainment media and messages and images in advertising influence beliefs and behaviours in those who are under the legal drinking age (Aitken 1989; Atkin 1990; Connolly *et al.* 1994; Jones and Donovan 2001; Martin *et al.* 2002; Waiters *et al.* 2001; Wyllie *et al.* 1998). Positive alcohol expectancies, in turn, have also been linked to current adolescent alcohol use (Aas 1993; Aas *et al.* 1995; Aas *et al.* 1998; Austin and Johnson 1997a; 1997b; Brown *et al.* 1987; Connelly *et al.* 1994; Grube and Wallack 1994; Kotch *et al.* 1986). Some of these studies, however, have been criticized in that they have not provided sufficient empirical support to assert a causal link between media exposure and attitudes and behaviours (Kohn and Smart 1984; Smart 1988), and also because some have reported very small effect sizes (Beccaria 2001; Grimm 2002; Nelson 1999; Strickland 1983).

Content analysis suggests that many alcohol advertisements link drinking with valued personal attributes (e.g., sociability, elegance, physical attractiveness) and with desirable outcomes (e.g., success, relaxation, romance, adventure) (Strickland *et al.* 1982). In general, children and adolescents find alcohol advertising with celebrity endorsers, humour, animation, and popular music to be particularly appealing (Chen and Grube 2002; Atkin and Block 1983). Adolescent boys are especially attracted to alcohol advertisements that depict sports (Slater *et al.* 1996; 1997).

One relatively large study looked into connections between **children's awareness** of alcohol advertising and their knowledge and beliefs about drinking (Grube 1995; Grube and Wallack 1994). The students' awareness of alcohol advertising was ascertained through presentations of a series of still photographs taken from television commercials for beer, with all references to the product or brand deleted. The children were asked if they had seen each advertisement and, if so, to identify the product being advertised. Children who were more aware of advertising had increased knowledge of beer brands and slogans as well as more positive beliefs about drinking, which was maintained with statistical accounting for the possibility that prior beliefs and knowledge could affect the children's awareness of the advertising.

Thus, a recent study found that young people with more **positive affective responses** to alcohol advertising held more favourable drinking expectancies,

perceived greater social approval for drinking, believed drinking was more common among peers and adults, intended to drink more as adults, and drank with higher frequency and in greater quantities (Chen and Grube 2002). These results were maintained, even though the reciprocal effects of alcohol consumption, intentions, and beliefs on positive effect toward alcohol advertising were controlled statistically.

Amongst 15 to 20 year olds, alcohol advertising is influential in shaping young people's attitudes and perceptions about alcohol advertising messages, which are in turn predictive of both positive expectancies and intentions to drink, suggesting that the effects of alcohol advertising on intentions to drink are mediated by cognitive responses to advertising messages and positive expectancies (Fleming *et al.* 2004). Fourteen year olds with greater exposure to advertisements in magazines, at sporting and music events and on television are more advertisement-aware than those with less exposure, as were teens who watch more TV, pay attention to beer advertisements and know adults who drink (Collins *et al.* 2003). Amongst 10-17 year olds, the perceived likeability of beer advertisements is a function of the positive affective responses evoked by the specific elements featured in the advertisements. Liking of specific elements featured in beer advertisements significantly contributed to the overall likeability of these advertisements and subsequently to advertising effectiveness indicated by purchase intent of product and brand promoted by these advertisements (Chen *et al.* 2005).

Changing behaviour

The impact of alcohol advertisements in changing behaviour can be measured by both consumer studies and population-based (largely econometric) studies.

Consumer studies

The impact that advertising can have on young people's behaviour is well illustrated by **smoking**, where it has been accepted that advertising is associated with cigarette use. A systematic review of nine longitudinal studies that followed up a total of over 12,000 baseline non-smokers found that exposure to tobacco advertising and promotion was associated with the likelihood that adolescents will start to smoke (Lovato *et al.* 2003). Based on the strength of this association, the consistency of findings across numerous observational studies, the temporality of exposure and smoking behaviours observed, as well as the theoretical plausibility regarding the impact of advertising, the review concluded that tobacco advertising and promotion increases the likelihood that adolescents will start to smoke.

Similar results have been found for **food preferences**, where a systematic review found: reasonably strong evidence, from 14 studies, that exposure to food promotion influences children's food preferences; strong and consistent evidence, from 7 studies, that exposure to food promotion influences children's purchasing and purchase-related behaviour; modest evidence, from 11 studies, that exposure to food promotion influences children's food consumption behaviour; evidence from 6 studies of a significant relationship between *television viewing* and diet, obesity and cholesterol; evidence from one study that greater exposure to *food adverts* was associated with higher snacking and calorific consumption; evidence, from 8 studies, that food promotion exerts an influence on children's food behaviour and diet *independently of* other influences such as parents' behaviour or price; and,

importantly, evidence, from 13 studies that food promotion influences children's brand preferences and their category preferences (Hastings *et al.* 2003).

Heavy drinking when it is not there

The importance of how young people perceive advertisements is illustrated by a study in which three groups of US college students (two-thirds of whom were aged 20 years or below) were exposed to the same set of two beer advertisements (Proctor *et al.* 2005). In these advertisements, the codes stipulate that the actors are not to be younger than 25 years of age and are not supposed to appear to be younger than 21 years of age. The results showed that while all actors were perceived to be, on average, older than the legal purchase age (21 years), the actors in one of the advertisements appeared younger than the minimum (real) age requirement of 25 years. All characters in the advertisements were perceived as attractive, with the female character being rated the highest. Although neither of the commercials depicted the physical act of drinking, the student raters nevertheless perceived the characters to be binge drinkers, in one advertisement perceived as consuming more than 5 drinks on normal occasions and more than 10 drinks on celebratory occasions. These data suggest that the information content of some advertisements, reflected perhaps in the actors' behaviour, appearance, language and situational context, conveys the message that the characters are heavy episodic drinkers, something that is not easily captured by advertising codes.

Early survey research of children and adolescents provided some evidence of links between **alcohol** advertising and a greater likelihood of drinking (Aitken *et al.* 1988; Atkin and Block 1980; Atkin *et al.* 1983 1984; Austin and Meili 1994; Austin and Nach-Ferguson 1995; Grube 1995; Grube and Wallack 1994; Wyllie *et al.* 1998a,b). The effects were small, however, and a few studies found no significant relationships (Adlaf and Kohn 1989; Strickland 1982 1983). Further, the survey study designs were unable to establish whether, for example, the advertisements caused the behaviours, or whether pre-existing behaviours led to an increased awareness of the advertisements.

A number of studies have attempted to find out whether children and adolescents who like alcohol advertisements have different drinking behaviours from those who do not like the advertisements. In one study of 213 children aged 7 to 12 years, the more the children liked alcohol advertisements, the more likely they were to have experimented with alcohol (Austin and Nach-Ferguson 1995).

New Zealand studies One New Zealand study that tracked a random sample of 677 teenagers over several years found that young men who, at age 15 years, could recall more alcohol commercials (mostly beer advertisements) drank greater quantities of beer when they were 18 than did those who could recall fewer commercials at age 15 (Connolly *et al.* 1994). However, opposite results were found for women.

A more recent study of 500 New Zealand children aged between 10 and 17 years found that the degree to which the children liked a set of beer advertisements influenced how much they expected to drink at age 20 years (Wyllie *et al.* 1998a). Statistical analysis concluded that, while liking alcohol advertising influences current

drinking status and intentions, the reverse does not seem to be true. In a similar study of an older age group, stronger results were reported in 1,012 randomly-selected 18- to 29-year-olds (Wyllie *et al.* 1998b). In this case, the more the respondents liked the alcohol advertisements, the more likely they were to drink at greater rates and to agree with positive belief statements such as “Drinking is a good way to escape from the hassles of everyday life.” Most important, the more they liked the advertisements, the more they reported drinking problems such as getting into a physical fight because of drinking. Statistical modelling concluded that alcohol advertising and responses to alcohol advertising influence drinking beliefs, behaviours, and problems rather than the other way around.

US studies In 1998, the US National Institute on Alcohol Abuse and Alcoholism funded three longitudinal studies. Ellickson *et al.* (2005) followed over 3,000 13–15-year-olds for three years. Comparing drinkers and non-drinkers at baseline, they found that exposure to in-store beer displays predicted drinking onset for non-drinkers after 2 years, and exposure to advertising in magazines and beer concession stands at sports or music events predicted frequency of drinking after two years. They found no significant predictive effect of exposure to television advertising for either drinkers or non-drinkers. However, Stacy *et al.* (2004) did find effects for television advertising. They began with a cohort of 2,250 12–13-year-olds and, using a combination of exposure and recall variables, found that an increase in viewing television programmes containing alcohol commercials was associated with a 44% increased risk of beer use, a 34% increased risk of wine or liquor use and a 26% increased risk of engaging in three-drink episodes a year later. Finally, the third study that used longitudinal data showed that market-level alcohol advertising expenditures were related positively to self-reported exposure to alcohol advertising and to individual-level alcohol consumption among youth and young adults, although the effects were small (Snyder *et al.* 2002).

Population studies

There have been mixed findings from population based studies, Table 7.10 (see Calfee and Scheraga 1994; Saffer 1995 1996). A UK study suggested that a 1-percent decrease in alcohol advertising would be associated, at most, with a 0.1-percent decrease in consumption (Godfrey 1994). U.S. data from 1970 through 1990 has also been analyzed to investigate changes in per capita consumption as a function of changes in advertising. Although the years with higher total wine and spirits advertising had higher relative levels of consumption, a model that accounted for changes over time found no evidence that changes in advertising were related to changes in consumption (Fisher and Cook 1995). The results did indicate that increased advertising of spirits was linked to a drop in the market share for wine, suggesting that such advertising may realign market share.

Later studies have suggested significant effects of alcohol advertising on alcohol-related problems (Saffer 1991 1997; Saffer and Dave 2004). Countries with partial restrictions had 16% lower alcohol consumption rates and 10% lower motor vehicle fatality rates than did countries with no restrictions, and countries with complete bans on television alcohol advertisements had 11% lower consumption rates and 23% lower motor vehicle fatalities rates than did countries with partial restrictions (Saffer 1991 1993b). After accounting for regional price differences and population variables such as income and religion, increases in alcohol advertising were found to be significantly related to increases in total and night time vehicle fatalities across US states (Saffer 1997). It was estimated that a total ban on alcohol advertising might

reduce motor vehicle fatalities by as much as 5,000 to 10,000 lives per year.

Table 7.10 Results of econometric studies of advertising on alcohol use and harm variables.

TIME SERIES STUDIES			
Blake and Nied (1997)	UK	1952-1991	Small increase due to advertising
Bourgeois and Barnes (1979)	Canada	1951-1974	No effect of advertising
Calfee and Scheraga (1994)	France Germany, Netherlands Sweden		No effect of advertising
Duffy (1987)	UK	1963-1983	No effect of advertising
Duffy (1991)	UK	1963-1985 quarterly	No effect of advertising
Duffy (1995)	UK	1963-1988 quarterly	No effect of advertising
Duffy (2001)	UK	1964-1996 quarterly	No effect of advertising
Franke and Wilcox (1987)	US	1964-1984 quarterly	Small increase due to beer and wine advertising
Grabowski (1976)	US	1956-1972	No effect of advertising
Lee and Trembley (1992)	US	1953- 1983	No effect of advertising
McGuinness (1980)	UK	1956-1975	Small increase due to spirits advertising
McGuinness (1983)	UK	1956-1979	Small increase due to beer advertising
Nelson (1999)		US quarterly	No effect of advertising
Nelson and Moran (1995)	US	1964-1990	No effect of advertising
Selvanathan (1989)	UK	1955-1975	Small increase due to beer advertising
CROSS-SECTIONAL STUDIES			
Goel and Morey (1995)	US	1959-1982	Increase due to advertising
Saffer (1997)	US	1986-1989 quarterly	Increase due to advertising
BAN STUDIES			
Interrupted Time Series			
Makowsky and Whitehead (1991)	Saskatchewan		No effect of advertising
Ogborne and Smart (1980)	Manitoba		No effect of advertising
Smart and Cutler (1976)	British Columbia		No effect of advertising
Multivariate			
Ornstein and Hanssens (1985)	US	1974-1978	Increase due to advertising
Saffer (1991)	OECD	1970-1990	Bans lead to reduction
Young (1993)	OECD	1970-1990	Mixed results
Nelson and Young (2001)	OECD	1970-1990	Bans lead to increase
Saffer and Dave (2002)	OECD	1970-1995	Bans lead to reduction

Source: Saffer and Dave (2003).

Amongst US 12 to 16 year-olds, the elasticity of advertising expenditure with respect to past month alcohol use was estimated at about 0.08 and with respect to past month binge participation at about 0.14 (Saffer and Dave 2003). The data suggested that the complete elimination of alcohol advertising could reduce adolescent monthly alcohol use by about 24% and binge participation by about 42%. The size of the effect was similar to a doubling of the price of alcohol, which was estimated to reduce adolescent monthly alcohol use by 28%, and binge drinking by 51%.

Econometric studies of the impact of advertising have a number of weaknesses that stem from the fact that they are dependent on the construction of complex equations to model an extremely sophisticated social phenomenon (Smart 1988; Godfrey 1989; Harrison and Godfrey 1989; Saffer 1996): data on key variables, most notably advertising expenditure, are often missing; advertising spending is assumed to be an accurate marker of advertising effectiveness, whereas content is also important (Strickland 1982); models do not account for consumers' active involvement in the communication process (Casswell 1995), leading to more effective advertisements (Casswell and Zhang 1998); complications such as feedback, the potential reciprocity of advertising and consumption levels, and advertising wear-out are frequently ignored; and they focus on advertising and ignore the integrated nature of marketing.

Not surprisingly, therefore, other studies have concluded that a total ban on broadcast alcohol advertising has no measurable effects on alcohol consumption, probably and largely due to substitution effects (Nelson 2003).

A physiological basis for marketing

Cue reactivity studies in alcohol-dependent adults have shown atypical physiological, cognitive, and neural responses to alcohol-related stimuli that differ from the responses of light drinkers. Adolescents aged 14 to 17 years with alcohol use disorders showed substantially greater brain activation to alcoholic beverage pictures than control youths, predominantly in brain areas linked to reward, desire, positive affect (Tapert *et al.* 2003). The degree of brain response to the alcohol pictures was highest in youths who consumed more drinks per month and reported greater desires to drink, Figure 7.6.

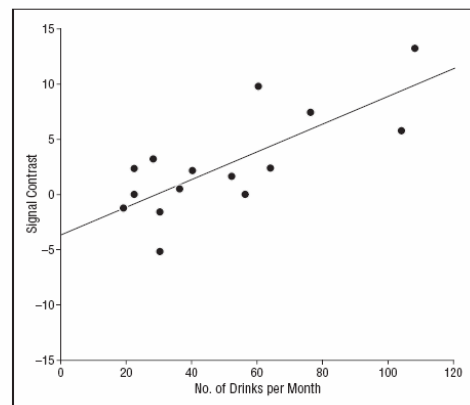


Figure 7.6 Blood oxygen level-dependent response signal contrast in the right precuneus/posterior cingulate region during exposure to alcoholic beverage pictures relative to non-alcoholic beverage pictures plotted as a function of drinks consumed per month for adolescents with alcohol use disorders. Source: Tapert *et al.* (2003).

Self-regulation of alcohol marketing

Regulation has three components: legislation (defining appropriate rules); enforcement (initiating actions against violators); and adjudication (deciding whether a violation has taken place and imposing an appropriate sanction) (Swire 1997). The term '**self-regulation**' means that the industry rather than the government is doing

the regulation. However, it is not necessarily the case that government involvement is entirely lacking. Instead of taking over all three components of regulation, industry may be involved in only one or two. For example, an industry may be involved at the legislation stage by developing a code of practice, while leaving enforcement to the government, or the government may establish regulations, but delegate enforcement to the private sector. Sometimes government will mandate that an industry adopt and enforce a code of self-regulation. Frequently an industry will engage in self-regulation in an attempt to stave off government regulation. Alternatively, self-regulation may be undertaken to implement or supplement legislation (Kuitenbrower 1997). The term '**co-regulation**' is sometimes used when the rules are developed, administered and enforced by a combination of government agencies and industry bodies (see Caswell and Maxwell 2005). In the United Kingdom, for example, broadcast advertising is co-regulated by Ofcom, the statutory body overseeing content and structure of the communications sector with responsibility for auditing, and the industry body, the Advertising Standards Authority, which has become a "one-stop shop" for all advertising standards and consumer complaints.

The claimed advantages of self-regulation over governmental regulation include efficiency, increased flexibility, increased incentives for compliance, and reduced cost. For example, it is argued that industry participants are likely to have superior knowledge of the subject compared to a government agency (Michael 1995). This factor may be particularly important where technical knowledge is needed to develop appropriate rules and determine whether they have been violated. Second, it is argued that self-regulation is more flexible than government regulation (Michael 1995). It is easier for a trade association to modify rules in response to changing circumstances than for a government agency to amend its rules. Moreover, self-regulation can be more tailored to the particular industry than government regulation. Another argument in support of self-regulation is that it provides greater incentives for compliance (Swire 1997). It is thought that if rules are developed by the industry, industry participants are more likely to perceive them as reasonable. Companies may be more willing to comply with rules developed by their peers rather than those coming from the outside. Fourth, it is argued that self-regulation is less costly to the government because it shifts the cost of developing and enforcing rules to the industry (Campbell 1999).

Critics of self-regulation question the basis for the arguments in favour of self-regulation. For example, while acknowledging that industry may possess greater technical expertise than government, it has been questioned whether companies will use that expertise to the benefit of the public, suggesting instead that they are more likely to employ their expertise to maximize the industry's profits (Swire 1997). Similarly, the idea that industry will comply more willingly with its own regulations than those imposed from the outside might seem somewhat weak where industry is actively involved in developing regulations. Leaving regulation to the industry can create the possibility that industry may subvert regulatory goals to its own business goals (Baker and Miller 1997). Self-regulatory groups may be more subject to industry pressure than government agencies. Moreover, the private nature of self-regulation may fail to give adequate attention to the needs of the public or the views of affected parties outside the industry. Many question the adequacy of enforcement in self-regulatory regimes, recognizing that industry may be unwilling to commit the resources needed for vigorous self-enforcement (Balkam 1997). It is also unclear whether industry has the power to enforce adequate sanctions. At most, a trade association may punish non-compliance with expulsion. Whether expulsion is an effective deterrent depends on whether the benefits of membership are important (Perrot 1997). Where a company can make greater profit by ignoring self-regulation than complying, it is likely to do so, especially where non-compliance is not easily

detected by the consumer or likely to harm the particular company's reputation (Swire 1997).

Codes of content typically include commitments not to couple alcohol with social and sexual success, and not to show intoxication or link alcohol with younger people or with driving. Research has consistently shown that the interpretation of these provisions varies depending on whether the review is being conducted by an industry appointed body, representatives of the public or the specific target audience involved. For example, an Australian study reported that representatives of the general public found a large sample of advertisements in violation of the relevant voluntary code, while the industry review board did not (Saunders and Yap 1991). As noted above, the content of contemporary marketing is increasingly sophisticated, subtle and interactive. This presents an increased challenge for monitoring and control of content. Brown (1995) identifies increasing use of post-modern elements in modern advertising – scepticism, subversiveness, irony, anarchy, playfulness and paradox. The fact that viewers are “active recipients” of advertising creates another major difficulty for the application of codes of content. Advertising messages are received and understood in the context of the recipients' lived experience. For example, advertisements that contain cues to indicate intoxication, without expressly showing it, can reinforce the norms supportive of heavy drinking. Research has documented that young people interpret advertisements as indicating drinking to intoxication (Wyllie *et al.* 1997; 1998) but these advertisements would not necessarily be perceived as such by all viewers. Similarly, while many codes restrict the use of young people in advertisements, having them present is not necessary for an advertisement to be appealing to under-age drinkers – it is enough to show the lifestyles to which young adults aspire (Hill and Caswell 2001). Thus, much alcohol marketing is likely to be effective in appealing to underage young people without violating the codes.

US self-regulation An example of the fragility of self-regulatory systems comes from the advertising of spirits on US television, as reported by Campbell (1999): *“The broadcast advertising of spirits was prohibited by the “Code of Good Practice” of the Distilled Spirits Council of the United States (DISCUS 1995), the national trade association of producers and marketers of distilled spirits. In March 1996, Seagram, the second largest marketer of distilled spirits, violated the Code of Practice by airing a spirits advertisement on a small sports cable network. A few months later, it violated the ban again by airing an advertisement on an ABC affiliate in Corpus Christi, Texas. Instead of imposing sanctions, however, DISCUS voted in November 1996 to repeal the voluntary prohibition (see Campbell 1999). According to DISCUS's President, the association saw no basis for allowing the broadcast advertising of beer and wine and not other alcoholic beverages. The members of DISCUS were undoubtedly aware of the Supreme Court's decision in 44 Liquormart, Inc. v. Rhode Island announced in May 1996, which struck down a state law prohibiting the advertisement of spirits prices. This decision effectively removed the credible threat of government regulation. Although DISCUS repealed the ban on broadcast advertising, other provisions of the DISCUS Code of Practice remained in effect. For example, the Code cautioned that distilled spirits should be portrayed ‘in a responsible manner’ and ‘should not be advertised or marketed in any manner directed or primarily intended to appeal to persons below the legal purchase age.’”*

The Federal Trade Commission (FTC) (1999) has questioned the efficacy of self-regulatory provisions. In August 1998, the FTC began an inquiry into the advertising practices of eight of the nation's top marketers of beer, wine, and spirits. It specifically sought information about how the companies had implemented Code provisions that prohibited advertising intended to appeal to or reach persons below

the legal drinking age. At the same time, the FTC (1998) filed a complaint against a beer advertisement that depicted young adults partying and drinking beer on a sail boat. The complaint noted that the advertisements were inconsistent with the Beer Institute's Code because they portrayed boating passengers drinking beer "while engaged in activities that require a high degree of alertness and coordination to avoid falling overboard." These actions by the FTC suggest that the self-regulatory codes of the alcoholic beverages industry are not being effectively enforced.

In 2003, the Federal Trade Commission commented that self-regulation practices had improved since the 1999 Report, although it expressed concern "*that unless care is taken, alcohol advertisements targeted to young legal drinkers also may appeal to those under the legal age*"; the reliability of its conclusions have been questioned (Mosher and Johnsson 2005).

Australian self-regulation In its 2003 report, the National Committee for the Review of Alcohol Advertising (NCRAA) found that approximately 5% of all complaints received by the Advertising Standards Board (ASB) relate to alcohol advertising. None of the 361 complaints about a total of 48 different alcohol advertisements has been upheld.

Adjudicating advertisements in Australia

Between May 1998 and April 1999, 11 alcohol advertising complaints (relating to 9 separate advertisements) were lodged with the Advertising Standards Board (ASB) by members of the general public. Marketing experts and advertising students were asked, without knowing the ASB's rulings, to judge whether the advertisement(s) breached any of the clauses of the Australian Association of National Advertisers' Code of Ethics or Alcoholic Beverages Advertising Code (Jones and Donovan 2002). A majority of the expert judges perceived breaches of the Codes for seven of the nine advertisements. For all nine of the advertisements, a majority of the university students felt that each of the advertisements was in breach of one or more of the Codes of Practice. The ASB had ruled that none of the advertisements breached any of the Codes.

The alcohol advertising code, the Alcoholic Beverages Advertising Code (ABAC), was established by the alcohol beverage industry and deals with alcohol-specific advertising issues, such as appeal to young people and alcohol consumption being linked to sporting or sexual success. The industry has established an Adjudication Panel to hear complaints which fall under the ABAC Code. Since its establishment in 1998, the ABAC Adjudication Panel has heard a total of 20 complaints. Of this total, five were upheld and thirteen were dismissed. During its review, NCRAA concluded that the current system does not address public health concerns about alcohol advertising and use: the general public is largely unaware of the complaint resolution system and, in particular, how to make complaints; there is insufficient reporting of how complaints are adjudicated and the outcomes of those complaints; the current system does not apply to all forms of advertising, for example, internet advertising and promotions; and the effectiveness of the current system is compromised by the amount of time taken to resolve complaints.

Advertising controls

Summary

There is evidence that **new product development** is attractive to and readily consumed by underage drinkers. **Price promotions** increase binge drinking and exposure to **point of purchase** advertising predicts onset of youth drinking. There is evidence for **targeting** of alcohol advertisements to underage drinkers, and consistent evidence that **exposure** to television, music videos and sponsorship which contain alcohol advertisements predicts onset of youth drinking and increased drinking. **Consumer studies** have shown that alcohol advertisements lead to positive expectancies and attitudes about alcohol. Consumer studies also show that exposure to tobacco advertising increases **smoking initiation** amongst young people, exposure to food advertising changes children's **food consumption behaviour**, and there is increasing evidence that exposure to alcohol advertisements increase **initiation of alcohol use** amongst adolescents. Despite the difficulties of population-based studies, there is a range of evidence with some **econometric studies** finding a relationship between the volume of advertising and drinking behaviour and outcomes, and others not. There is some evidence that advertising affects brain activity linked to rewards and desires. In conclusion, restricting the volume of commercial communications of alcohol products is likely to reduce harm, Table 7.11. Since advertisements have a particular impact in promoting a more positive attitude to drinking amongst young people, and, even in advertisements that do not portray drinking of alcohol, young people perceive the characters as heavy drinkers, it is likely that restricting the content of advertisements will reduce harm, although this has not been specifically evaluated. To date, self-regulation of commercial communications by the beverage alcohol industry does not have a good track record for being effective.

Table 7.11 Effectiveness ratings for advertising controls.

	Effectiveness ¹	Breadth of Research Support ¹	Cost Efficiency ¹
Reducing the volume of advertising	+ / ++	++	+++
Advertising content controls	?	O	++

¹For definitions see Table 7.1

Source: Babor *et al.* (2003) (modified).

Impact and costs

The World Health Organization's CHOICE modelled the impact of advertising controls based on a 2%-4% reduction in the incidence of hazardous alcohol use, derived from international time-series analyses of the impact of an advertising ban (Grube and Agostinelli 2000; Saffer 2000; Saffer and Dave 2002). Although not politically acceptable in contemporary Europe, were an advertising ban to be implemented throughout the Union, the model estimated that it can prevent between 300 (EuroB countries) and 616 (EuroC countries) DALYs per million people per year, at a cost of between €12 (EuroC countries) and €23 (EuroA countries) per 100 people per year (see Figures 7.11 and 7.12 at the end of the chapter). The model estimated that a ban on advertising implemented throughout the Union, could prevent 202,000 years of disability and premature death, at an estimated cost of €95 million each year (adapted from Chisholm *et al.* 2004).

POLICIES THAT REDUCE HARM IN DRINKING AND SURROUNDING ENVIRONMENTS

Licensed drinking environments

Licensed drinking environments are associated with drunkenness (Snow and Landrum 1986), drink-driving (Fahrenkrug and Rehm 1994; Gruenewald *et al.* 1996; O'Donnell 1985; Single and McKenzie 1992) and problem behaviours such as aggression and violence (Ireland and Thommeny 1993; Rossow 1996; Stockwell *et al.* 1993), with some licensed premises being associated with a disproportionate amount of harm (Sherman 1992; Stockwell 1997; Briscoe and Donnelly 2003a). Aspects of the bar environment that increase the likelihood of alcohol-related problems (Graham and Homel 1997) include serving practices that promote intoxication, an aggressive approach taken to closing time by bar staff and local police (Tomsen 1997), the inability of bar staff to manage problem behaviour (Homel *et al.* 1992; Wells *et al.* 1998), general characteristics of the environment such as crowding and permissiveness of bar staff (Homel and Clark 1994), the general type of bar (Gruenewald *et al.* 1999; Stockwell *et al.* 1992), and physical comfort, the degree of overall 'permissiveness' in the bar, the availability of public transport, and aspects of the ethnic mix of customers (Homel *et al.* 2004).

Responsible beverage service Nearly all evaluations in training bar staff in responsible beverage service when backed up with enforcement have demonstrated improved knowledge and attitudes among participants (Graham 2000; Graham *et al.* 2002; Hauritz *et al.* 1998a; Homel *et al.* 1997), although this wears off over time (Hauritz *et al.* 1998b). These studies have also shown some effects on serving practices (Johnsson and Berglund 2003), but not always (Donnelly and Briscoe 2003). Whilst servers are usually willing to intervene with customers who are visibly intoxicated (Gliksman *et al.* 1993), they generally will not intervene with individuals solely on the basis of the customer's estimated blood alcohol concentration (BAC) or number of drinks consumed (Howard-Pitney *et al.* 1991; Saltz and Stanghetta 1997; Gliksman *et al.* 1993; McKnight 1991). In addition, training tends to decrease bad serving practices such as "pushing" drinks and increase "soft" interventions such as suggesting food or slowing service. In terms of the effects on customer intoxication, several studies have found that server training results in lower BAC levels of customers generally (Geller *et al.* 1987; Russ and Geller 1987) and fewer customers with high BAC levels (Lang *et al.* 1998; Saltz 1987; Stockwell *et al.* 1993). Moreover, time series analyses of mandatory server training suggest that training is associated with fewer visibly intoxicated customers (Dresser 2000) and fewer single-vehicle night-time injury-producing crashes (Holder and Wagenaar 1994). Studies of the impact of adhering to bar policies for avoiding intoxication (Stockwell 2001) have also found modest effects in reducing heavy consumption and high risk drinking (Howard-Pitney *et al.* 1991; Lang *et al.* 1998; Wallin *et al.* 1999; Toomey *et al.* 2001), but were not as successful as originally expected (Stockwell 2001). Responsible beverage service programs are frequently included in broad-based interventions (Homel *et al.* 2001) that have shown reductions in violence (Homel *et al.* 1997; Wallin *et al.* 2003; Felson *et al.* 1997; Putnam *et al.* 1993; Maguire *et al.* 2003).

Active enforcement The impact of responsible beverage service is greatly enhanced when there is active, but ongoing enforcement of laws prohibiting sale of alcohol to intoxicated customers (Jeffs and Saunders 1983; McKnight and Streff 1994; Saltz and Stanghetta 1997; Homel *et al.* 2001). Increasing the perceived risk of apprehension for an offence can deter individuals from future violations of the law (e.g. Homel 1988; Nagin 1998; Sherman *et al.* 1998). This is a cost effective intervention in which the benefits greatly exceed the costs (Levy and Miller 1995).

Community action in holiday resorts

The goal of the Surfers Paradise project was to reduce violence and disorder associated with the high concentration of licensed establishments in the resort town of Surfers Paradise in Queensland, Australia (Homel *et al.* 1997). The project involved three major strategies: (1) the creation of a Community Forum including the development of task groups and a safety audit; (2) the implementation of risk assessments, Model House Policies, and a Code of Practice; (3) regulation of licensed premises by police and spirits licensing inspectors. This project and its replications in three North Queensland cities (Cairns, Townsville and Mackay) resulted in significant improvements in alcohol policy enforcement, in the bar environment, in bar staff practices, and in the frequency of violence (Hauritz *et al.* 1998a). Following the intervention, the number of incidents per 100 hours of observation dropped from 9.8 at pre-test to 4.7 in Surfers Paradise and from 12.2 at pre-test to 3.0 in the replication sites. However, the initial impact of the project was not sustained. Two years following the intervention in Surfers Paradise, the rate had increased to 8.3, highlighting the need to find ways to maintain gains achieved from community action projects.

Enforcement also seems to be a necessary component for voluntary codes of responsible beverage service to be successful (Lang and Rumbold 1997; Homel *et al.* 1997). One study found that a programme combining stricter enforcement of alcohol sales laws and training in responsible beverage service had a significant effect in reducing the rate of violent crimes between 10 pm and 6 am (Wallin *et al.* 2003). There is some evidence that enforcement checks prevent alcohol sales to minors (Wagenaar *et al.* 2005), restricted to the specific establishments checked and with limited diffusion to the whole community; most of the enforcement effect decayed within three months, suggesting that a regular schedule of enforcement is necessary to maintain deterrence. Further, there is some evidence that enforcement activity focuses more on breaches committed by patrons or minors, rather than licensees or vendors who are in breach of the intoxication provisions of the liquor laws (Donnelly and Briscoe 2003; Briscoe and Donnelly 2003b).

Legal liability Holding servers legally liable for the consequences of providing more alcohol to persons who are already intoxicated or those under age has shown consistent benefits as a policy measure in the US (Holder *et al.* 1993; Sloan *et al.* 2000), with lower rates of traffic fatalities (Chaloupka *et al.* 1993; Ruhm 1996; Sloan *et al.* 1994a; Wagenaar and Holder 1991) and homicide in states with such liability (Sloan *et al.* 1994b), compared to states that do not have the liability. Such use of legal liability is uncommon outside of the United States (with the exception of some cases in Australia and Canada).

Geographical analysis (Wilson and Dufour 2000) can be used to identify specific drinking localities and problems related to alcohol, particularly motor vehicle crashes, pedestrian injuries, and violence (Gruenewald *et al.* 2002). This allows targeted public health and law enforcement approaches, as shown in Figure 7.7.

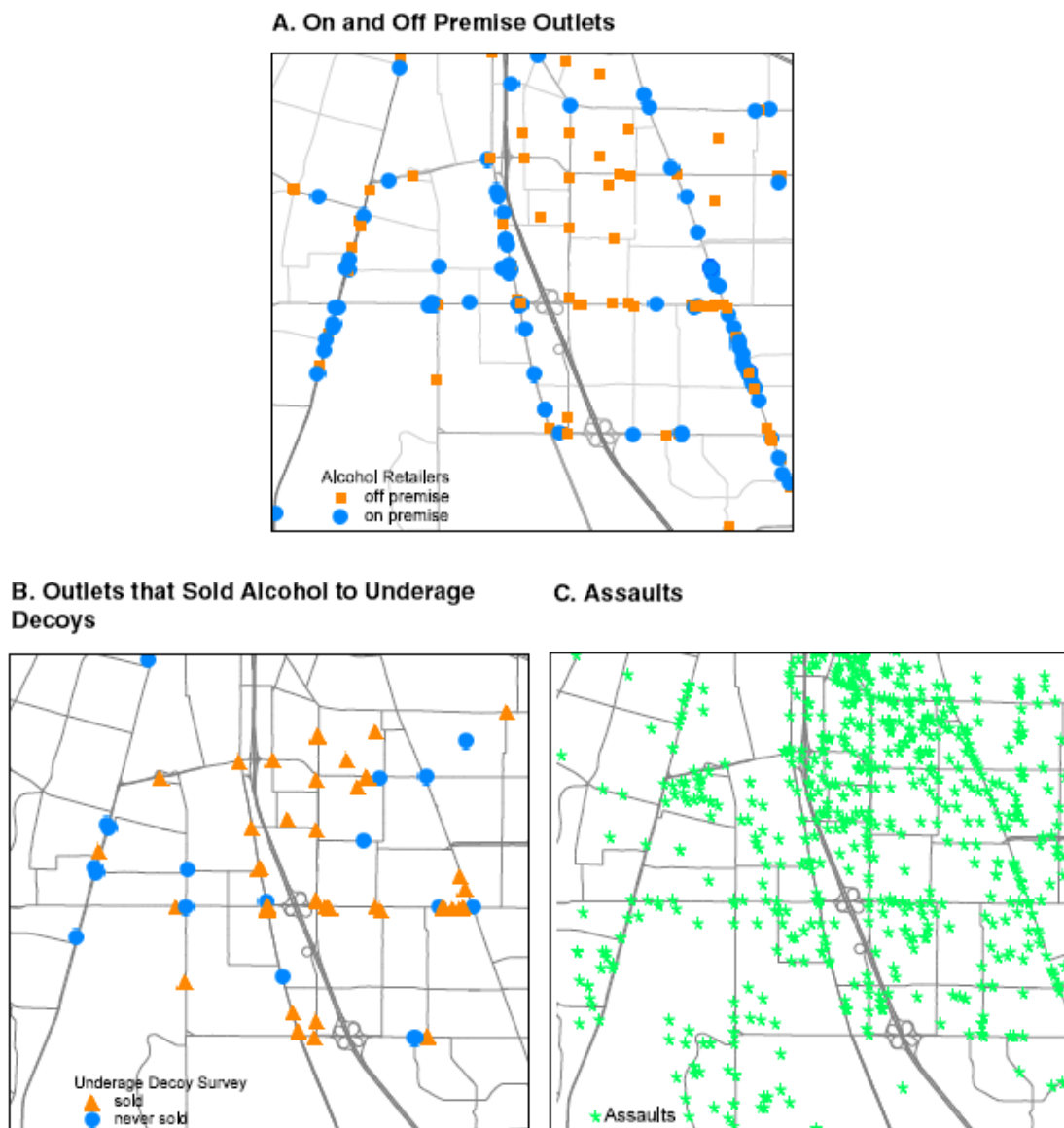


Figure 7.7 Illustration of the use of maps and mapping in alcohol policy. These tools can be used to study the locations of alcohol outlets and alcohol-related problems. Figure A shows all the alcohol outlets in a given geographic area. Outlets that sold alcohol to underage decoys are shown in figure B, and assaults in figure C. Source: Gruenewald *et al.* (2002).

Other harm reduction approaches The risks of aggression, violence and injury (Stockwell, Lang and Rydon 1993) vary according to the physical bar-room environment (Graham *et al.* 1980; Stockwell *et al.* 1993; Homel and Clark 1994) and the behaviour and communication skills of bar staff (Hauritz *et al.* 1998a; Wells *et al.* 1998). Accordingly, interventions that focus on changing the barroom environment (e.g. changes in rules or policies related to games, management of queues and re-

The Safer Bars programme

The *Safer Bars* program developed in Canada includes a risk assessment (Graham 1999) and a training component (Braun *et al.* 2000) for owners, managers and all staff. The program was designed to increase early intervention by staff, improve teamwork and staff abilities in managing problem behaviour, and reduce the risk of injury to patrons. The *Safer Bars* training was shown to be highly valued by bar staff and managers and demonstrated a significant impact on knowledge and attitudes (Graham *et al.* 2002). There was also a significant effect in reducing both moderate (e.g. pushing and holding) and severe (e.g. punching and kicking) aggression (Graham *et al.* 2004). The effects were lessened when there was high turnover of managers and door and security staff.

entry to the bar, modifications of the social or physical environment and improvement in staff communication and intervention skills) have been shown to be effective in reducing harms from drinking in these settings, without necessarily altering overall consumption levels (Homel *et al.* 1997; Graham *et al.* 2004; see also review by Graham 2000).

Interventions focused on public transportation Various studies using a variety of methodologies have identified public transport availability as a key issue (d'Abbs, Forner and Thomsen 1994; Homel *et al.* 1997; Homel *et al.* 1991; Engineer *et al.* 2003) moderating the incidence of alcohol-related violence around licensed premises. Where there is a high concentration of licensed premises, a lack of public transport has the effect of retaining large groups of intoxicated and frustrated people in a small area. No direct evaluations of the impact of strategies to improve transport have been identified, although such interventions have been part of larger multi-component interventions that demonstrated reductions in violence (Homel *et al.* 1997; Hauritz *et al.* 1998) as well as interventions that did not show a reduction in violence (d'Abbs and Forner 1995).

Safer drink containers It is well-established that intentional and unintentional injuries from broken drinking vessels are relatively common in licensed premises. This relationship led to the logical suggestion that replacing conventional glass vessels with tempered glass should reduce injuries. However, a randomised controlled trial comparing conventional glassware with tempered (toughened) glassware (Warburton and Shepherd 2000) reported increased injuries to staff from accidental breakage of tempered glassware. As yet, there is no research on the impact of tempered glass on intentional injuries to patrons.

Reducing harm in drinking environments

Summary

There is growing evidence for the impact of strategies that alter the drinking context in reducing the harm done by alcohol, Table 7.12. However, these strategies are

primarily applicable to drinking in bars and restaurants, and their effectiveness relies on adequate enforcement. Passing a minimum drinking age law, for instance, will have little effect if it is not backed up with a credible threat to remove the licenses of outlets that repeatedly sell to the under-aged. Such strategies are also more effective when backed up by community-based prevention programmes (see below).

Table 7.12 Effectiveness ratings for drinking environments.

	Effectiveness ¹	Breadth of Research Support ¹	Cost Efficiency ¹
Responsible beverage service	+	+++	++
Active enforcement	++	+	+
Server liability	+++	+	+++
Enforcement of on-premise regulations	++	+	+
Public transport	?	+	+
Safer bar environment/containers	?	O	++

¹For definitions see Table 7.1
Source: Babor *et al.* (2003) (modified).

Community mobilization approaches

Community based prevention programmes can be effective in reducing drinking and driving, alcohol related traffic fatalities and assault injuries (Giesbrecht 2003; Stockwell and Gruenewald 2001; Holmila 1997; Holder 1998; Hingson *et al.* 2005; Clapp *et al.* 2005). Community mobilization has been used to raise awareness of problems associated with on-premise drinking, develop specific solutions to problems, and pressure bar owners to recognize that they have a responsibility to the community in terms of such bar-related issues as noise level and customer behaviour (Hauritz *et al.* 1998; Homel *et al.* 1992; Putnam *et al.* 1993). Evaluation results from community mobilization approaches as well as documentation from grassroots projects (Arnold and Laidler 1994; Cusenza 1997) suggest that community mobilization can be successful at reducing aggression and other problems related to drinking in licensed premises.

A review of ten community-based prevention trials which have sought to reduce harm from alcohol (Aguirre-Molina and Gorman 1996; Chou *et al.* 1998; Douglas *et al.* 1990; in press; Gliksman *et al.* 1995 1999; Grube 1997; Hingson *et al.* 1996; Holder *et al.* 1997a 2000; Holder and Treno 1997; Johnson *et al.* 1990; Pentz *et al.* 1989a; Perry *et al.* 1993 1996; Voas 1997; Wagenaar *et al.* 1994; 2000) found that strategies included education and information campaigns, media advocacy, counter-advertising and health promotion, controls on selling and consumption venues and other regulations reducing access to alcohol, enhanced law enforcement and surveillance, and community organization and coalition development (Giesbrecht *et al.* 2003). Interventions which showed promise were those that paid particular attention to controls on access, included the environmental contexts of where the products are sold and distributed, and involved enforcement of public health polices (see also (Holder 1998a; 1998b).

Community and neighbourhood characteristics are important in moderating the pricing and promotion of beer (Harwood *et al.* 2003), as well as reducing binge drinking (Nelson *et al.* 2005). Communities with higher enforcement of minimum purchase ages have lower rates of alcohol use and binge drinking (Dent *et al.* 2005). Community action projects can mobilize awareness and concern about alcohol-related harm (Allamani *et al.* 1997; 2003; Holmila 2003). Social capital as measured by aggregate reports of student volunteerism is associated with a decreased risk of binge drinking, drunkenness and alcohol-related harm (Weitzman and Chen 2005), and as measured by high trust is related to a reduced risk of illegally produced and purchased alcohol (Lindstrom 2005).

Since 1996, a multi-component program based on community mobilization, training in responsible beverage service for servers and stricter enforcement of existing alcohol laws has been conducted in Stockholm, Sweden, leading to a 29% reduction in violent crimes in the intervention area, compared with the control area (Wallin *et al.* 2003), Figure 7.8.

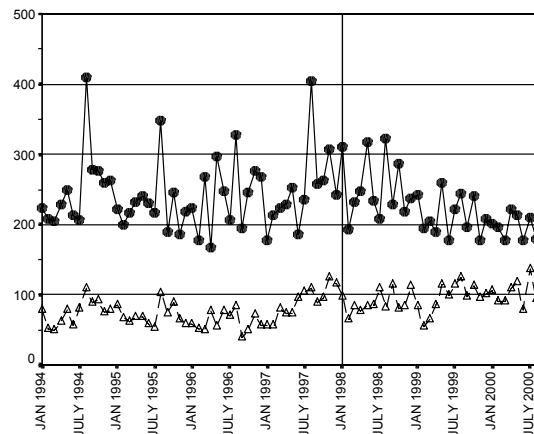


Figure 7.8 Police-reported violence in experimental area (filled circles) and in control area (triangles). Source: Wallin *et al.* (2003).

The Community Trials Project (Holder *et al.* 1997) was a five-component community-level intervention to reduce alcohol-related harm among all residents of three communities. The project included a media and mobilization component, a responsible beverage service component, a sales to youth component to reduce underage access to alcohol, a drinking and driving component, and an access component to reduce the availability of alcohol. The project led to reduction in drink driving accidents, assault injuries, and harmful alcohol use (Holder *et al.* 2000). Finally, cost-benefit analyses estimated that the trial resulted in savings of €2.9 for every €1 spent on program implementation, based upon reductions in automobile crashes alone (Holder *et al.* 1997).

A community intervention project in the Northern Territories in Australia aimed to reduce levels of alcohol consumption and related harm down to national levels by 2002 (d'Abbs 2004) by using a range of strategies including education, increased controls on alcohol availability, and expanded treatment and rehabilitation services (Stockwell *et al.* 2001; d'Abbs 2004). The Living With Alcohol (LWA) program was originally funded by a specific alcoholic beverage levy on the sale of alcohol products with more than 3% alcohol by volume until 1997, when a federal ruling prohibited states and territories from raising licence fees and additional taxes on alcoholic beverages, tobacco and petrol. As a direct result, the LWA levy was removed in August 1997 which, in turn, resulted in a fall in the real price of alcoholic beverages with more than 3% alcohol by volume (O'Reilly 1998). The Federal government continued to fund the LWA program at the same level until the year 2000. After this time, LWA funds were dispersed directly to the existing programs and services (d'Abbs 2004). The programme was effective in reducing acute (by 4.6 per 100,000 adults) and most likely chronic (by 3 per 100,000 adults) alcohol-related deaths in the Northern Territories, Figures 7.9 and 7.10, compared with reductions of 1.6 per 100,000 acute and 1.7 per 100,000 chronic alcohol-related deaths in the control area (Chikritzhs *et al.* 2005).

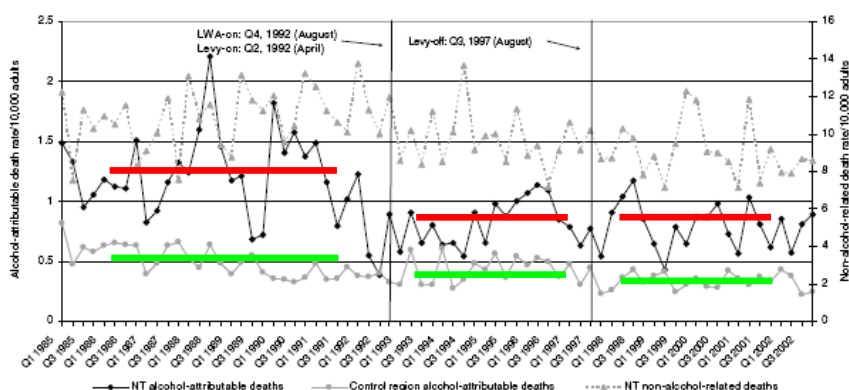


Figure 7.9 Trends in acute death rates per 10,000 adults in NT [●] and Control region [●] 1985-2002. Source: Chikritzhs *et al.* (2005).

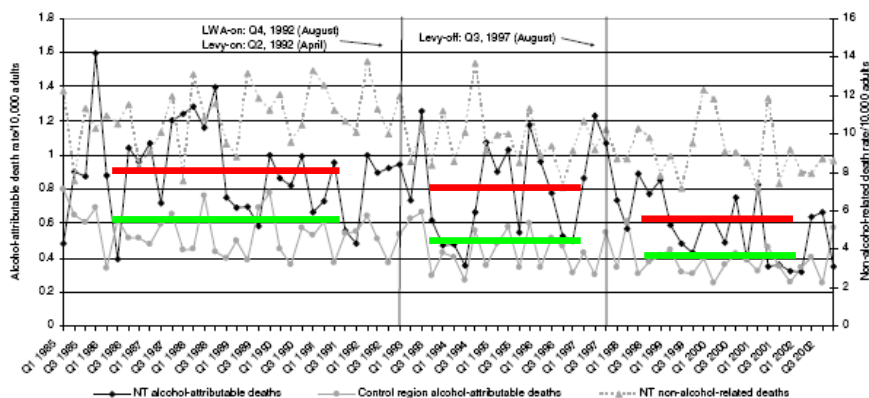


Figure 7.10 Trends in chronic death rates per 10,000 adults in NT [●] and Control region [●] 1985-2002. Source: Chikritzhs *et al.* (2005).

Reducing harm through community mobilization

Summary

Community mobilization and intervention projects are effective in reducing the harm done by alcohol, Table 7.13.

Table 7.13 Effectiveness ratings for community mobilization.

	Effectiveness ¹	Breadth of Research Support ¹	Cost Efficiency ¹
Community mobilization	++	++	+

¹For definitions see Table 7.1
Source: Babor *et al.* (2003).

POLICIES THAT SUPPORT ADVICE AND TREATMENT FOR HAZARDOUS AND HARMFUL ALCOHOL CONSUMPTION AND ALCOHOL DEPENDENCE

Whilst the management of alcohol problems has clear benefit at the level of the individual, there is some limited evidence for its impact at the level of the population (Smart and Mann 1993; Smart and Mann 2000; Smart *et al.* 1989; Smart and Mann 1990; Mann *et al.* 1991). There is some evidence that declining liver cirrhosis rates might be associated with the increased treatment for alcohol problems in Ontario, Canada (Mann *et al.* 1988; Mann *et al.* 2005), Sweden (Romelsjo 1987) and North Carolina (Holder and Parker 1992).

Social welfare-based programmes Programs of structured home visits to support mothers, before and in the first two years after birth, have evidence supporting their effectiveness and cost effectiveness when targeted to vulnerable families (Mitchell *et al.* 2001; Loxley *et al.* 2004). These programs offer basic advice, practical assistance with nursing, and advocacy for access to services. They show evidence of positive outcomes for maternal alcohol use and infant health.

There is evidence for the value of both universal and selective parenting programs for pre-primary school age children to reduce child behaviour problems that predict

The impact of home visiting

Olds *et al.* (1997; 1998; 1999) evaluated a program involving regular home visiting by a nurse from late pregnancy until the child's second birthday for low income, unmarried and adolescent women having their first babies. The program focused upon supporting the mother, promoting positive attachment with the child and teaching parenting skills. Follow-up associated the program with reduced rates of alcohol use for the mothers during pregnancy, leading to reductions in alcohol-related cognitive impairment in the children as pre-schoolers. The children have been followed up to age 15 years, documenting reductions in their early initiation of alcohol use.

the emergence of harmful alcohol use (Serketich and Dumas 1995). There is evidence for positive outcomes (school adjustment and academic attainment) and good cost-benefit ratios from targeted programs to prepare children from high-risk families for primary school. Outcomes from these studies have been documented by following children through to adolescence, and have found reduced alcohol use (Schweinhart *et al.* 1993).

Advice to reduce alcohol use during pregnancy Of three good-quality behavioural counselling studies in primary care settings that targeted pregnant women making prenatal visits, two found no evidence for an effect on alcohol consumption (Handmaker *et al.* 1999; Chang *et al.* 1999) and one a possible effect which just failed to reach statistical significance (Reynolds *et al.* 1995). There is evidence for the impact of home visits for women with harmful alcohol use during an index pregnancy (Grant *et al.* 2005); home visits that assisted women in obtaining alcohol treatment and staying abstinent, and linking them with comprehensive community resources led to improved attendance at treatment, better treatment outcomes, and a greater likelihood of subsequent pregnancies being alcohol free.

The importance of pre-school

The Perry pre-school project in the United States found long-term program effects up to age 27, including a lower incidence of alcohol use and teenage pregnancy, lower risk of school drop out, increased likelihood of employment and reduced reliance on welfare (Schweinhart *et al.* 1993). Cost benefit analyses suggested savings of up to €6 for every €1 invested in the programme for a one year programme.

Workplace The workplace provides several opportunities for implementing prevention strategies, since the majority of adults are employed, spending a significant proportion of their time at work. The workplace can also be a risk factor for harmful alcohol use. A systematic review and meta-analysis of 485 studies with a combined sample size of 267,995 individuals found that job dissatisfaction was a powerful predictor for burnout, low self-esteem, depression, and anxiety (Faragher *et al.* 2005). Many studies have found significant associations between stress in the workplace and elevated levels of alcohol consumption (Martin and Roman 1996; Lehman *et al.* 1995; Parker and Farmer 1990; Greenberg and Grunberg 1995), increased risk of problem drinking (Bobak *et al.* 2005) and alcohol dependence (Head *et al.* 2004), and between alienation (an employee's broader sense of identity and control) and drinking behaviours (Seeman and Anderson 1983; Seeman *et al.* 1988; Lehman *et al.* 1995; Rospenda *et al.* 2000).

A series of evaluation studies have indicated that the workplace programs succeeded in returning substantial proportions of employees with alcohol problems to effective performance (Asma *et al.* 1980; Edwards *et al.* 1973; McAllister 1993; Spickard and Tucker 1984; Walsh *et al.* 1991 1992; Blum and Roman 1995). Supervisory training significantly increased positive attitudes toward workplace-based employee assistance programmes, increased the perceived likelihood of utilizing the service, and led to greater service utilization. (Googins and Kurtz 1981; Hoffman and Roman 1984). A workplace prevention training programme for stress management has been shown to reduce problem drinking from 20% to 11% and missing work because of a hangover from 16% to 6% (Bennett *et al.* 2004).

Brief advice for hazardous and harmful alcohol use Table 7.14, from the Mesa Grande study, an ongoing updated systematic review of the effectiveness of different treatments for hazardous and harmful alcohol consumption, ranks the effectiveness of 48 different treatment modalities (Miller and Wilbourne 2002). Mesa Grande summarizes the evidence after weighting the findings of studies by their methodological quality score; the higher the score, the better is the quality of the study. Study ratings also resulted in the assignment of an outcome logic score for each treatment modality for which specific efficacy could be inferred from the design. A positive outcome logic score is assigned when a study design permitted strong inference of a specific effect (e.g. comparison of the treatment with an untreated control), and a beneficial effect was reflected as a statistically significant difference. A negative outcome logic score is assigned when a study has a design logic that should clearly show a treatment effect if one were present (e.g. comparison with a no-treatment or placebo control). The Cumulative Evidence Score (CES) is the methodological quality score multiplied by the outcome logic score, summed across

all studies, with positive trials adding points and negative trials deducting points from the total. Treatment modalities are listed in Table 7.14 ranked by the CES.

Table 7.14 Effectiveness of treatments for hazardous and harmful alcohol consumption.

Treatment modality	CES	N
1. Brief advice	390	34
2. Motivational Enhancement	189	18
3. GABA Agonist (Acamprosate)	116	5
4. Community Reinforcement	110	7
5. Self-Change Manual (Bibliotherapy)	110	17
6. Opiate Antagonist (e.g.naltrexone)	100	6
7. Behavioural Self-Control Training	85	31
8. Behaviour Contracting	64	5
9. Social Skills Training	57	20
10. Marital Therapy – Behavioural	44	9
11. Aversion Therapy, Nausea	36	6
12. Case Management	33	5
13. Cognitive Therapy	21	10
14. Aversion Therapy, Sensitization	18	8
15. Aversion Therapy, Apnoeic	18	3
16. Family Therapy	15	4
17. Acupuncture	14	3
18. Client-Centred Counselling	5	8
19. Aversion Therapy, Electrical	-1	18
20. Exercise	-3	3
21. Stress Management	-4	3
22. Antidipsotropic - Disulfiram	-6	27
23. Antidepressant - SSRI	-16	15
24. Problem Solving	-26	4
25. Lithium	-32	7
26. Marital Therapy – Non-behavioural	-33	8
27. Group Process Psychotherapy	-34	3
28. Functional Analysis	-36	3
29. Relapse Prevention	-38	22
30. Self-Monitoring	-39	6
31. Hypnosis	-41	4
32. Psychedelic Medication	-44	8
33. Antidipsotropic - Calcium Carbimide	-52	3
34. Attention Placebo	-59	3
35. Serotonin Agonist	-68	3
36. Treatment as Usual	-78	15
37. Twelve Step Facilitation	-82	6
38. Alcoholics Anonymous	-94	7
39. Anxiolytic Medication	-98	15
40. Milieu Therapy	-102	14
41. Antidipsotropic – Metronidazole	-103	11
42. Antidepressant Medication	-104	6
43. Videotape Self Confrontation	-108	8
44. Relaxation Training	-152	18
45. Confrontational Counselling	-183	12
46. Psychotherapy	-207	19
47. General Alcoholism Counselling	-284	23
48. Education (tapes, lectures or films)	-443	39

CES = Cumulative Evidence Score.
N = Total number of studies evaluating this modality.

Source: Miller and Wilbourne (2002)

Brief advice heads the list of evidence-based treatment methods. There is a very large body of research evidence on alcohol brief advice, including at least 56 controlled trials of effectiveness (Moyer *et al.* 2002). There have been at least 14 meta-analyses and/or systematic reviews, using somewhat different aims and methods, of research on effectiveness of brief advice (Bien, Tonigan and Miller 1993; Freemantle *et al.* 1993; Kahan, Wilson and Becker 1995; Wilk, Jensen and Havighurst 1997; Poikolainen 1999; Irvin, Wyer and Gerson 2000; Moyer *et al.* 2002; D'Onofrio and Degutis 2002; Berglund, Thelander and Jonsson 2003; Emmen *et al.* 2004; Ballesteros *et al.* 2004a 2004b; Whitlock *et al.* 2004; Cuijpers, Riper and Lemmens 2004; Bertholet *et al.*, in press). All these have reached conclusions, in one form or another, favouring the effectiveness of brief advice in reducing alcohol consumption to low-risk levels among hazardous and harmful drinkers. The number needed to treat is about 8 for both hazardous and harmful alcohol consumption and for alcohol-related harm (Anderson 2003). This means that 8 patients at risk need to be offered advice for one to benefit.

There is mixed evidence of **longer-term effects** of brief advice. A trial based in family medicine in Wisconsin, USA reported continuing benefits for alcohol use, binge drinking episodes and frequency of excessive drinking among recipients of brief intervention compared with controls 4 years after intervention (Fleming *et al.* 2002). An Australian study reported that the benefits of receiving brief advice had disappeared after 10 years (Wutzke *et al.* 2002) and it was suggested that booster sessions would be necessary to maintain the effect over this period of time.

There is some evidence that brief advice reduces **alcohol-related mortality** (Cuijpers, Riper and Lemmens 2004), albeit from a small number of studies. Moyer *et al.* (2002) also reported that brief advice was effective on a composite of various

Brief advice

The World Health Organization has modelled the impact and cost of providing primary care based brief advice to 25% of the at-risk population; applying this to the Union finds an estimated 408,000 years of disability and premature death avoided at an estimated cost of €740 million each year.

drinking-related outcomes, including measures of alcohol-related problems. There is also direct evidence from an Australian study in general practice that brief advice is effective in reducing alcohol-related problems among those who receive them (Richmond *et al.* 1995). In a controlled study of mass screening and brief intervention with follow-up, for men in Malmo, Sweden, there was a

significant decline in hospital admissions and mortality in the treated group over a four year follow-up period, an 80% reduction in absenteeism in the four years following the study, a 60% reduction in total hospital days over five years, and a 50% reduction in all cause mortality over six years, which was maintained at 10-16 years follow-up (Kristenson *et al.* 2002).

There has been considerable concern about the ability to **engage health care providers** in delivering brief advice programmes (see Anderson *et al.* 2003). However, results from international trials (Anderson *et al.* 2004; Funk *et al.* 2005), and a meta-analysis (Anderson *et al.* 2004) have found that education and support programmes are effective and cost effective in increasing the involvement of primary care providers in delivering brief advice programmes.

After brief advice, behavioural skill training and pharmacotherapies dominate the remainder of the top 10 list of treatment methods supported by controlled trials (Table 7.14). It is also important to identify what has strong negative evidence for effect (i.e. does not work). Here one finds methods such as twelve-step facilitation, group psychotherapy, educational lectures and films, mandatory attendance at A.A. meetings, and relatively unspecified general alcoholism counselling, often of a confrontational nature.

Accident and emergency departments Brief advice delivered in emergency departments and trauma centres has been shown to be effective in reducing alcohol consumption (D'Onofrio and Degutis 2002; D'Onofrio *et al.* 1998; Longabaugh *et al.* 2001; Gentilello *et al.* 1999; Spirito *et al.* 2004; Mello *et al.* 2005) and alcohol-related harm (Monti *et al.* 1999; Gentilello *et al.* 1999; Longabaugh *et al.* 2001; Mello *et al.* 2005). A systematic review of 23 studies found evidence for reduced motor-vehicle crashes and related injuries, falls, suicide attempts, domestic violence, assaults and child abuse, alcohol-related injuries and injury emergency visits, hospitalizations and deaths, with reductions ranging from 27% to 65% (Dinh-Zarr *et al.* 2004).

Advice for hazardous and harmful alcohol consumption and alcohol dependence

Summary

There is extensive evidence for the impact of brief advice, particularly in primary care settings, in reducing harmful alcohol consumption, Table 7.15.

Table 7.15 Effectiveness ratings for interventions.

	Effectiveness ¹	Breadth of Research Support ¹	Cost Efficiency ¹
Social welfare based programmes	+	+	+
Pregnancy based programmes	+	+	+
Work based programmes	++	+	+
Brief advice in primary care	+++	+++	++
Brief advice in accident and emergency departments	++	++	++

¹For definitions see Table 7.1

Source: Babor *et al.* (2003) (modified).

Impact and cost

In the CHOICE model, brief interventions such as physician advice provided in primary health care, which involve a small number of education sessions and psychosocial counselling, were modelled to influence the prevalence of hazardous drinking by increasing remission and reducing disability (Higgins-Biddle and Babor 1996; Moyer *et al.* 2002; Babor *et al.* 2003), which would have the effect of shifting the entire distribution of hazardous drinking downwards if applied to the total population at risk (a reduction in overall prevalence of 35-50%, equivalent to a 14-18% improvement in the rate of recovery over no treatment at all). The estimates were adjusted for treatment adherence (70%) and target coverage in the population (25% of hazardous drinkers). If implemented throughout the European Union, the model estimated that a brief intervention programme reaching 25% of the at risk population can prevent between 512 (EuroB countries) and 1056 (EuroC countries) DALYs per million people per year, at a cost of between €26 (EuroB countries) and €185 (EuroA countries) per 100 people per year (see Figures 7.11 and 7.12 at the end of the chapter). The model estimated that the provision of primary care based brief interventions to 25% of the at-risk population throughout the Union can prevent an estimated 408,000 years of disability and premature death at an estimated cost of €740 million each year (adapted from Chisholm *et al.* 2004).

COST-EFFECTIVENESS OF DIFFERENT POLICY OPTIONS

A summary of the estimated impact of different interventions, (DALYs prevented per million people per year) compared to a Europe with none of these policies is shown in Figure 7.11, and the estimated costs (Euro per 100 people per year) in Figure 7.12, for the three regions of the European Union, based on the WHO classification, Table 7.2.

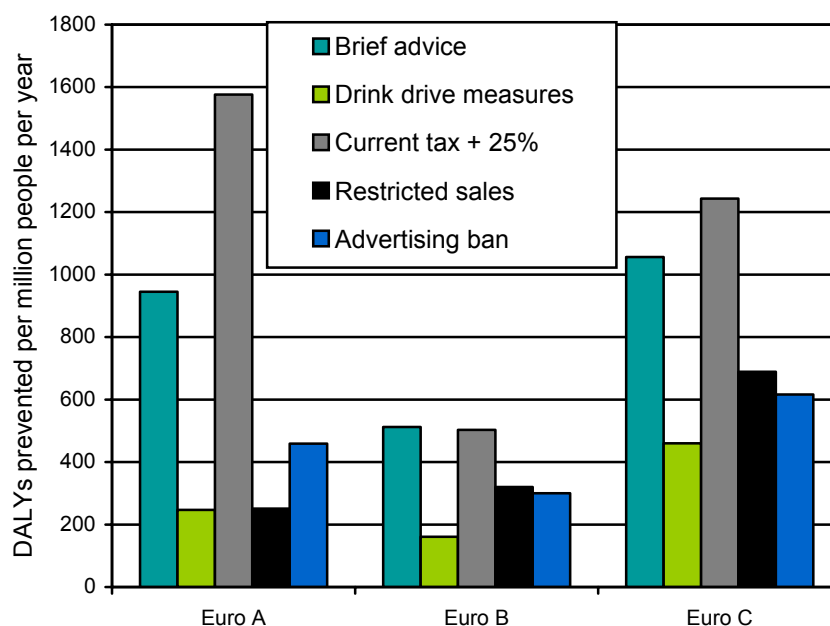


Figure 7.11 The impact of different policy options (DALYs prevented per million people per year) in the three sub-regions of EU25. Source: Chisholm *et al.* (2004) (adapted).

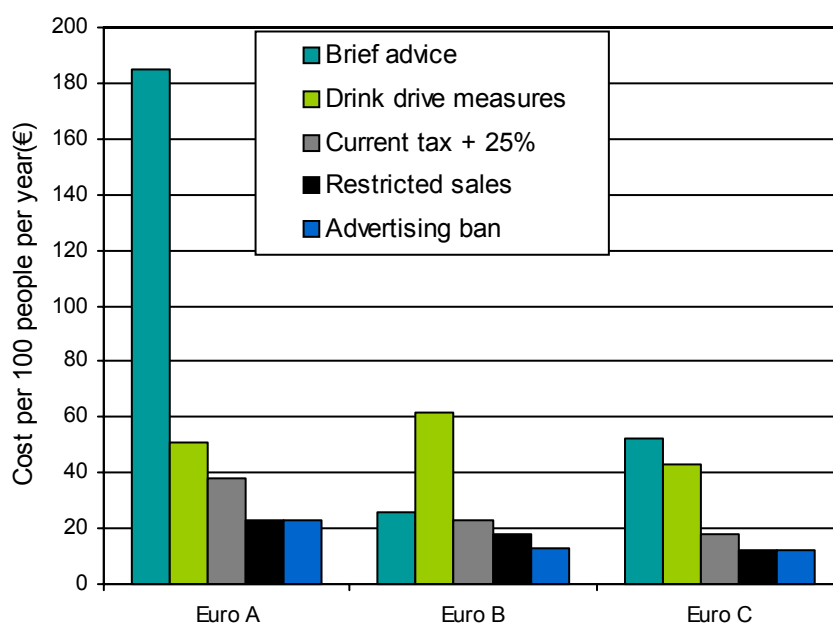


Figure 7.12 The cost of different policy options (per 100 people per year (€)) in the three sub-regions of EU25. Source: Chisholm *et al.* (2004) (adapted).

In all three regions, taxation (current tax levels with a 25% increase in tax, compared to no tax) has the greatest impact in reducing the harm done by alcohol, followed by brief interventions delivered by primary providers to 25% of the at risk population.

The three regulatory measures, (taxation, restricted sales and advertising controls) are the cheapest in terms of cost to implement, with drink driving measures and brief interventions being the most expensive. Although brief interventions are the most expensive to implement, it should be noted that within health service expenditure, brief interventions for hazardous and harmful alcohol consumption are one of the most cost effective of all health service interventions in leading to health gain (Anderson *et al.* 2005).

Cost effectiveness

Figures 7.13 to 7.15 show the cost effectiveness of the different interventions, singly and in combination. The vertical axis (log scale) is the cost (€) per 100m people per year and the horizontal axis (log scale) is the number of DALYs prevented per million people per year. The blue diagonal lines (also on a log scale moving from right to left) show the cost effectiveness in Euros per DALY prevented, ranging from €100 per DALY (bottom right) to €10,000 per DALY (top left). So, for example, in Figure 7.13, it is estimated that a policy setting the tax at the current level plus 25% (◆) at a cost of €38 per 100 people per year could prevent 1576 DALYs per million people per year with a cost effectiveness ratio of €241 per DALY prevented. It should be emphasized that all the interventions for reducing hazardous and harmful alcohol use show a highly favourable ratio of cost to effect. Each DALY averted by these efficient strategies costs considerably less than average annual income per capita, a threshold proposed by the Commission on Macroeconomics and Health for an intervention to be considered *very cost-effective* (WHO 2001, WHO 2002:108).

It is clear in all three sub-regions of the European Union, that taxation (*and ◆), restricted access (+), and advertising bans (-) are the most cost-effective policy options. But, it should also be noted that, compared with other health service interventions, brief interventions (◆) are also highly cost effective, with a cost effectiveness ratio of between €493 (EuroC countries) and €1959 (EuroA countries). Implementing all five options is also extraordinarily cheap, compared to the social cost of alcohol (see Chapter 6). Compared with no programme at all, a programme that included brief physician advice, random breath testing, current taxation plus 25%, restricted access and an advertising ban (■) would cost only €1.3 billion, and avert 1.4 million alcohol related DALYs a year.

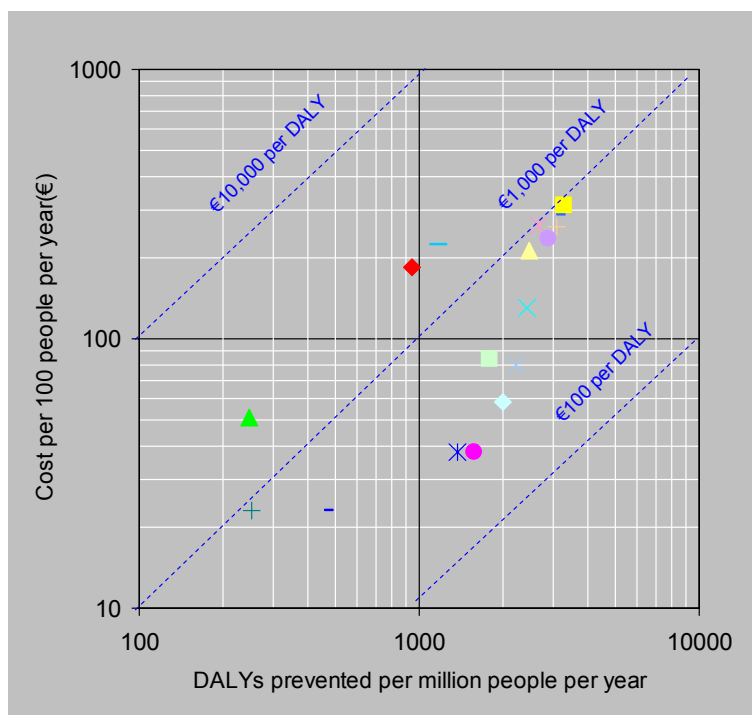


Figure 7.13 Cost effectiveness of different policy options for **EU25 A** countries (log scales). Diagonal lines show cost cost effectiveness in € per DALY prevented. (Legend, see below). Source: Chisholm *et al.* (2004) (adapted).

- ◆ **A. Brief physician advice (25% coverage)**
- ▲ **B. Random Breath Testing**
- ✱ **C1. Current tax**
- **C2. Current tax + 25%**
- + **D. Restricted access (sales)**
- **E. Advertising ban**
- **F1. Brief advice+RBT**
- ◇ **F2. Tax+Ad Ban**
- **F3. Tax+RBT**
- ▲ **F4. Brief advice+Tax**
- ✕ **F5. Tax+Ad Ban+Restrict access**
- ✱ **F6. Brief advice+Tax+RBT**
- **F7. Brief advice+Tax+Ad Ban**
- + **F8. Brief advice+Tax+Ad Ban+Restrict access**
- **F9. Brief advice+Tax+Ad Ban+RBT**
- ✕ **F10. Tax+Ad ban+Restrict access+RBT**
- **F11. Brief advice+Tax+Ad ban+RBT+Restrict access**

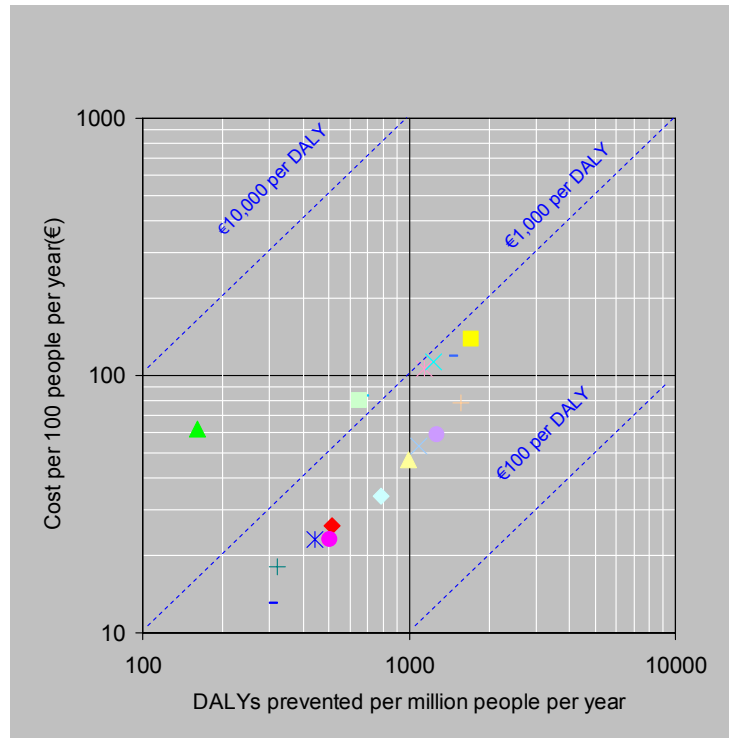


Figure 7.14 Cost effectiveness of different policy options for **EU25 B** countries (log scales). Diagonal lines show cost effectiveness in € per DALY prevented. (Legend, see Figure 7.13). Source: Chisholm *et al.* (2004) (adapted).

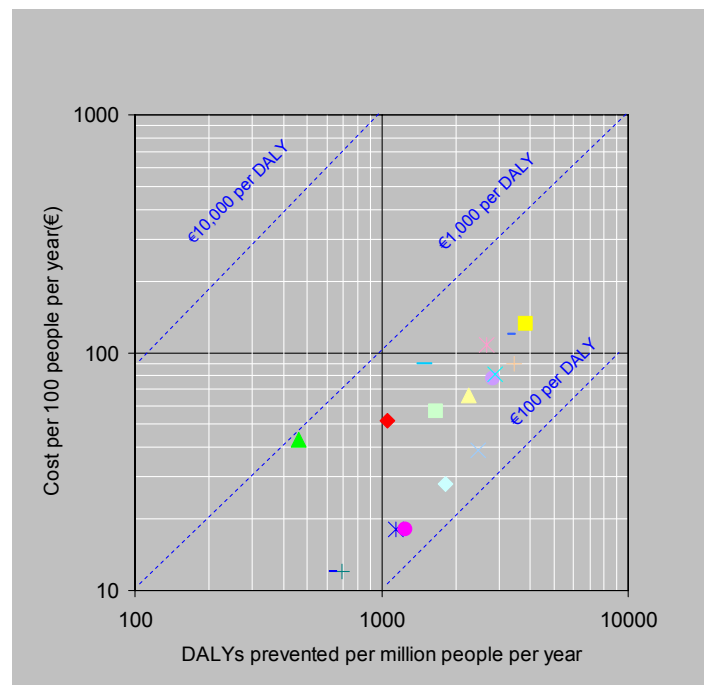


Figure 7.15 Cost effectiveness of different policy options for **EU25 C** countries (log scales). Diagonal lines show cost effectiveness in € per DALY prevented. (Legend, see Figure 7.13). Source: Chisholm *et al.* (2004) (adapted).

CONCLUSION

There is a wealth of evidence to advise which alcohol policies and programmes work and which do not work to reduce the harm done by alcohol. Although there is a dominance of North American literature in testing the effectiveness of alcohol policy options, the robustness of the evidence is strengthened by a consistency of evidence over time and in different jurisdictions, countries and cultures. What is particularly striking is that the policies which work are those that foster a supportive environment in which individuals are enabled to make healthy choices, although such evidence does not always translate into policy (Marmot 2004).

Programmes and policies that are directed to the individual, such as school based educational programmes are the least effective. This is not to say that such programmes should be abandoned; rather, it is not a good use of scarce resources to invest heavily in such programmes, recognizing at the same time that mass media programmes have a particular role to play in reinforcing community awareness of the problems created by alcohol use and to prepare the ground for specific interventions.

The exception to the lack of effectiveness of individually-based programmes is where problems or risk of problems are already occurring; there is strong evidence that brief interventions based in healthcare settings for individuals with existing hazardous and harmful alcohol consumption are effective in reducing the harm done by alcohol. What is also clear is that both enforcement and comprehensive approaches are important. For example, the impact of responsible beverage service is much enhanced when there is active enforcement and the support of community based prevention programmes.

The other striking conclusion is that alcohol policy is not only effective, but it is also cheap. Compared with no programme at all, a comprehensive programme that is modelled to reduce the burden of alcohol to the Union by nearly one third would only cost the governments of the Union as a whole an estimated €1.3 billion a year, about 1% of the total tangible costs of alcohol to society and only about 10% of an estimate of the income gained from a 10% rise in the price of alcohol due to taxes in the EU15 countries.

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