A BACKGROUND REPORT ON RELEVANT DATA ON ALCOHOL CONSUMPTION, ALCOHOL-RELATED PROBLEMS AND RELEVANT POLICIES

Report from the Swedish Presidency June 2001

CONTENTS

1. INTRODUCTION

This factual report reviews the state of the art in the different areas emphasised in the draft council conclusions on a community strategy to reduce alcohol-related harm. The report will serve as background material for the discussions under the agenda item *Alcohol as a Health Determinant*. To a large extent, the data presented are based on analyses of, and reports from, the European Comparative Alcohol Study (ECAS). In broad terms, the ECAS project concerns alcohol policies, alcohol consumption, and alcohol-related harm within a comparative and longitudinal approach 1950-1995 in the Member States of the European Union as of 1998. However Luxembourg was not included for methodological reasons, while Norway has been added to the set of countries to broaden the representation of northern Europe. The project was granted funding by the European Commission, DG V/F in August 1998, and was scheduled to be completed in the summer of 2001 (see Norström, 2001). In addition to the results from the ECAS study this report also draws on information from other sources, using data from the WHO, for example.

The report is structured into four interrelated but yet distinct areas:

1. Analyses of drinking habits and drinking patterns with special focus on young people and alcohol.
2. Analyses of alcohol-related problems (the relationship between changes in per capita alcohol consumption and changes in mortality, self perceived alcohol-related problems, drinking and driving, pregnancy and drinking, alcohol-related work problems).
4. Analyses of alcohol control policies

2. TRENDS IN DRINKING HABITS

For all the different dimensions of drinking habits covered in this text, the presentation will begin with overall, national estimates and then continue to present age and gender specific results, if available. As concerns estimates of per capita alcohol consumption, the data are based on the recorded alcohol consumption (sales statistics) for each of the countries studied . These kind of aggregate data do not permit any detailed analyses of national differences in drinking patterns, and neither is it possible to break down these data in sub-populations, for example, gender and age. For these purposes data at an individual level are needed. For that reason the ECAS project also focused on individual data, both by conducting a review of existing survey data on adult populations and by conducting a special survey in six Member States in Spring 2000. All the consumption data presented, except country specific per capita consumption, derive from general population surveys. The ECAS survey was conducted in countries representing groups with different drinking cultures. The traditional wine drinking countries were represented by France and Italy, the beer drinking countries (in Central Europe, Ireland and the UK) by Germany and the UK and the former spirits drinking countries but now beer drinking countries by Finland and Sweden. One important result from this review was the lack of comparable data over time, which made it impossible to present any detailed systematic all-European long-term trends of drinking patterns from the 15 countries. Most survey data have been collected during the past 20 years and most of them in the Nordic countries and The Netherlands.

2.1. Volume of drinking: mean alcohol consumption

The recorded consumption data show strong evidence for increased convergence in beverage preferences between the study countries during the study period 1950 to 1995, measured as the proportion for each alcoholic beverage to total consumption. This means that the countries' traditional alcoholic beverage has been losing ground at the expense of other alcoholic beverages, i.e. wine in the Mediterranean countries, beer in Central Europe (including Ireland and the UK) and spirits in the three Nordic countries Finland, Norway and Sweden.

Also the country differences in consumption levels (litres 100% alcohol per inhabitants aged 15 and over [per capita, 15+]) have diminished over the years. In the period 1950 to the mid 1970s, the convergence was the result of strong consumption growth in the low consumption countries in Central and Northern Europe, whereas the levels in the high consumption Mediterranean countries remained more stable or, as for France, declined. From mid 1970s and onwards, the converging process has slowed down, only sustained by a drastic reduction of consumption (wine) in the Mediterranean countries (see Figure 1). The Mediterranean wine-drinking countries' consumption has approached the other countries' per capita consumption. The average difference between the beer countries (Central European countries, Ireland and the UK) and the wine-drinking (Mediterranean) countries in per capita consumption in the mid 1990s amounts to no more than a few decilitres of pure alcohol.

The decreasing differences in alcohol consumption, especially between the wine and beer-drinking countries is also reflected in alcohol-related mortality. Especially relevant here is the trends in the number of liver cirrhosis deaths because differences in cirrhosis rates are indicative of differences in the prevalence of chronic abuse or heavy drinking. The cirrhosis trends shown in Figure 2 suggest that not only the differences in per capita alcohol consumption have been reduced over time between the wine-drinking countries and the remaining countries, especially the beer-drinking countries, but also the differences in the prevalence of chronic heavy drinking.

The method used in the ECAS to estimate the trend in consumption of unrecorded alcohol gave no indication of an increased consumption of unrecorded alcohol in the Mediterranean countries. On the contrary, the results could indicate a slight decrease in those countries. In the northern European countries, however, unrecorded alcohol consumption has increased, from about 1 litre in the 1980s to 2 litres per capita 15+ in the second half of the 1990s. There were also signs of increased unrecorded alcohol in the UK, too, starting from the mid 1980s. In the remaining countries in Central Europe, the changes in unrecorded alcohol appeared to be modest over time.

After adjusting the recorded consumption figures for differences in unrecorded consumption the differences in total alcohol consumption between the countries became somewhat reduced. However, despite differences in unrecorded alcohol, the relative position between the countries in their total consumption remains to a large extent unaffected, both in the 1980s and in the 1990s. Thus, the explanation as to why consumption has declined in Southern Europe and why Norway and Sweden, in particular, show a lower per capita consumption than the other countries must be sought elsewhere than by referring to country differences in the volume of unrecorded alcohol.

Age differences

Since the alcohol-related mortality has decreased in most age groups in those countries with a declining mortality rate, and increased in most age groups in those countries with an increasing mortality rate, it implies that the large decrease in consumption in Southern Europe is the result of reduced consumption in most age groups.

The heaviest drinking groups are most typically males in their thirties and forties. However, the age distribution differ between on the one hand the northern European countries and the UK, and on the other and central and southern European countries. The ECAS survey shows that young adults report the highest consumption in Sweden and the UK in particular, but also in Finland. Earlier studies conducted in the 1990s in Sweden and the UK confirm this age pattern (see Leifman, 2001a; Statistical bulletin, 1999). Norwegian data show a similar age pattern as the Swedish (NOU, 1995). As shown in Table 1, in France, Italy and Germany, the consumption increases from the youngest group to the middle age group, except for women in Germany. The oldest age group (50-64) also shows a higher mean consumption than the youngest. Other studies from Central and Southern Europe – from France (in SFSP, 1998), Austria (Uhl & Springer, 1996) and Germany (Kraus & Bauernfeind, 1998) show rather similar age distributions in consumption. Survey data show that in no country do adolescents below 20 years of age drink more than their elders.

Figure 1. *Consumption trends for three groups of countries, per capita, 15+ based on recorded alcohol. Based on consumption figures for each country.*

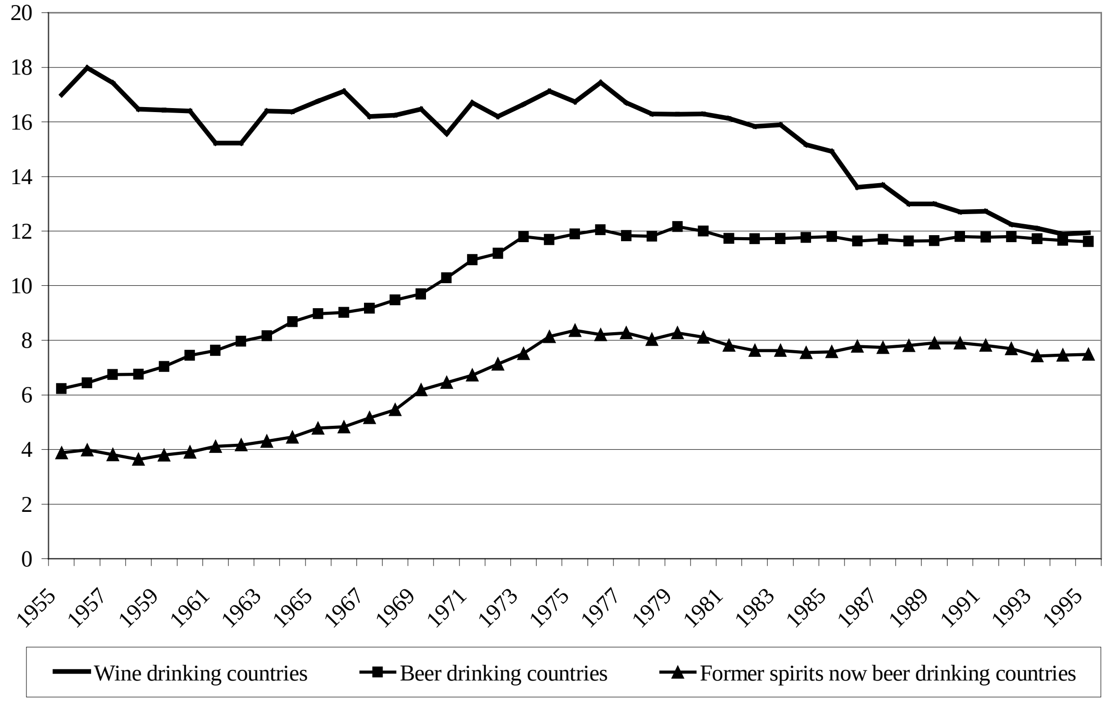
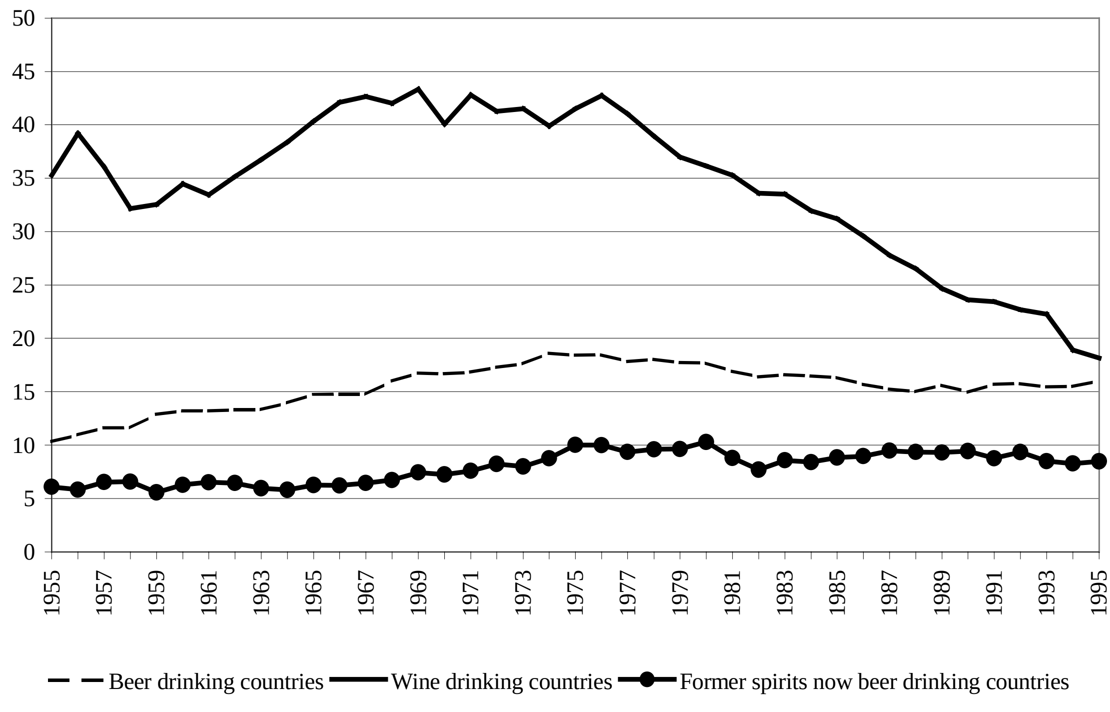


Figure 2. *Age standardised liver cirrhosis rates, per capita 15+ in three groups of countries based on cirrhosis mortality data (underlying cause of death) for each country.*



Importance of early drinking for later heavy drinking: One question crucial for prevention for young people is the association between drinking habits at young ages and drinking in older ages. Two questions will be dealt with here. The first concerns the importance of early drinking behaviour for the risk of future high alcohol consumption and alcohol-related problems. The second question, which is related to the first, relates to the stability of drinking in youth and early adulthood. Is there a strong continuity in drinking during adolescence and perhaps into adulthood?

Alcohol consumption debut: Many studies have shown that the age of alcohol debut, and advanced drinking habits in young ages, are associated with increased risk of subsequent problem drinking during adolescence (e.g. Tennant, et al, 1975; Forney, *et al.*, 1988; Pape & Hammer, 1996). In a study of adolescents from Oslo, Pedersen and Skrondal (1998) found that the age of alcohol debut had a strong and independent effect on both subsequent alcohol consumption and the development of alcohol-related problems throughout adolescence. These effects were invariant across sex. Most of these studies have, however, a rather short study period, often a few years during adolescence. A few studies have though also shown that early debut or high consumption in adolescence is predictive of alcohol-related problems during adulthood (Chou & Pickering, 1992; Tennant, *et al.*, 1975; Andréasson, *et al.*, 1991). A twenty-year follow-up study of Swedish conscripts showed that, although the predictive power of alcohol consumption decreased over time, there was still an association between level of alcohol consumption on conscription at the age 18-19 years and total mortality, including alcohol-related deaths, suicides, traffic accidents, almost twenty years later as the cohort approached middle age.

Practically all these longitudinal and follow-up studies have been conducted in the Anglo-Saxon and Nordic countries. The relationship between early drinking and later drinking is very likely mediated by cultural contexts. Thus, the findings cannot be generalised to other societies with different drinking cultures. In Southern Europe, for example, the associations may look very different, since age of alcohol debut occur at younger ages.

One crucial question is if the predictive power of early onset of drinking and early heavy drinking on future drinking habits are expressions of real causal effects or maybe due to other factors that affect both the debut and the likelihood of problem drinking in the future. An important and much-repeated finding of past research has been the link between aggressive behaviour, delinquent activity (behaviour that deviates from social norms) and earlier onset of drinking and problematic use (e.g. Donovan & Jessor, 1995; Donovan *et al.*, 1998; Jessor & Jessor, 1977, White *et al.*, 1999). Thus, children with early signs of deviant behaviour have a higher risk of later problem behaviour, including truancy, drugs and alcohol abuse, and criminality. Seen from this perspective, alcohol use is only one part of a broader syndrome of adolescent problem behaviour, that includes other drug use, earlier sexual activity and delinquent and aggressive conduct.

According to Pedersen (1998), the age of alcohol debut is strongly influences by parents' and peers' drinking habits. However, even after controlling for parents' and peers' use and norms the importance of early debut remained. It is possible that in some drinking cultures, the debut in itself influences future drinking habits. According to others, however, the link between early debut and increased risk for problem drinking later on is not causally related (e.g. Prescott & Kendler, 1999). A strong preventive implication of the link between alcohol debut age and subsequent problem drinking, is that interventions should aim at postponing alcohol debut age, a weaker preventive implication that measures should be implemented for the early onset drinkers.

Stability of drinking habits: Several studies have been conducted on the stability of drinking during adolescence but without reaching any clear consensus, among other things due to differences in definitions of variables, age groups time periods between the measurement points. However, despite great variation among reported studies, the main impression is still that adolescent drinking is a rather weak predictor of future drinking habits (see Pape & Hammer, 1996). But it is possible that adolescents with early excessive drinking, more likely than others occupy their relative position as high consumers also in young adulthood. In relative terms, the stability may thus be stronger among initial heavy drinkers. This agrees with a growing number of studies stressing the continuity in personality traits and behavioural patterns over time (Pape & Hammer, 1996).

Gender differences

A review of existing survey data showed that the women's share of aggregate alcohol consumption varies between 25 and 35 percent. Roughly similar shares have been reported from several earlier studies. Table 1 also shows that for the six countries included in the ECAS-survey, men consume more alcohol than women in all age groups. For the whole age group 18-64 years, men consume at least twice as much alcohol as women.

Except for the Nordic countries, the Netherlands and the UK, there is fairly little information on the possible trends in women's share of the consumption over time. The decline of temperance among women in the former spirits countries in Northern Europe led to a significant increase of women's share in the 1960s and 1970s. In the Netherlands, a similar turn occurred a bit earlier. Otherwise, it is difficult to say whether an increase of women's drinking can have been an all-European phenomenon in the post-war years.

Abstinence

In the traditionally temperance-minded Nordic countries (the "former spirits countries" Finland, Norway, and Sweden) abstinence rates turned into decline in the 1960s and 1970s. At the same time, the differences in abstinence rates between men and women diminished, but did not disappear. In the Central European beer countries, the data does not allow any long-term analyses, but the figures indicate a lower prevalence of abstinence than in the Nordic countries. The few results from Mediterranean wine-drinking countries indicate that abstinence rates among women have been as high or higher than in the Nordic countries.

The ECAS-survey showed rather small age differences in abstinence rate in the six countries but with a tendency of the lowest proportion of abstainers in the youngest age group (18-29).

Table 1. Age and gender differences in mean alcohol consumption (litres 100% alcohol/year) in the six study countries, by gender and age.

		Men		Women		
Study countries	Age-groups	Mean consumption	Index Total=100	Mean consumption	Index Total=100	Ratio men/women
Finland	18-29	8.2	117	2.9	121	2.8
	30-49	6.2	89	2.2	92	2.8
	50-64	6.8	97	2.4	100	2.8
	Total	7.0	100	2.4	100	2.9
France	18-29	6.1	81	1.8	82	3.4
	30-49	8.0	107	2.4	109	3.3
	50-64	8.6	115	2.4	109	3.6
	Total	7.5	100	2.2	100	3.4
Germany	18-29	4.3	81	3.2	133	1.3
	30-49	6.1	115	2.2	92	2.8
	50-64	5.2	98	2.1	88	2.5
	Total	5.3	100	2.4	100	2.2
Italy	18-29	6.4	90	2.5	71	2.6
	30-49	7.0	99	3.8	109	1.8
	50-64	7.7	108	3.8	109	2.0
	Total	7.1	100	3.5	100	2.0
Sweden	18-29	7.5	142	1.9	112	3.9
	30-49	4.7	89	1.6	94	2.9
	50-64	3.8	72	1.6	94	2.4
	Total	5.3	100	1.7	100	3.1
UK	18-29	16.0	122	7.9	155	2.0
	30-49	11.1	85	5.0	98	2.2
	50-64	13.2	101	3.1	61	4.3
	Total	13.1	100	5.1	100	2.6

2.2. How often one drinks alcoholic beverages: the frequency of drinking

Several studies have shown that regular or daily drinking is the lowest in the former spirits drinking countries and the highest in the wine drinking countries (e.g. Hanhinen, 1995; Hupkens *et al.*, 1993; Leifman, 2001a). A comparison of survey data for 2000 and 1988/90 suggest that also the frequencies of drinking situations have converged somewhat between the EU-countries (Table 2).

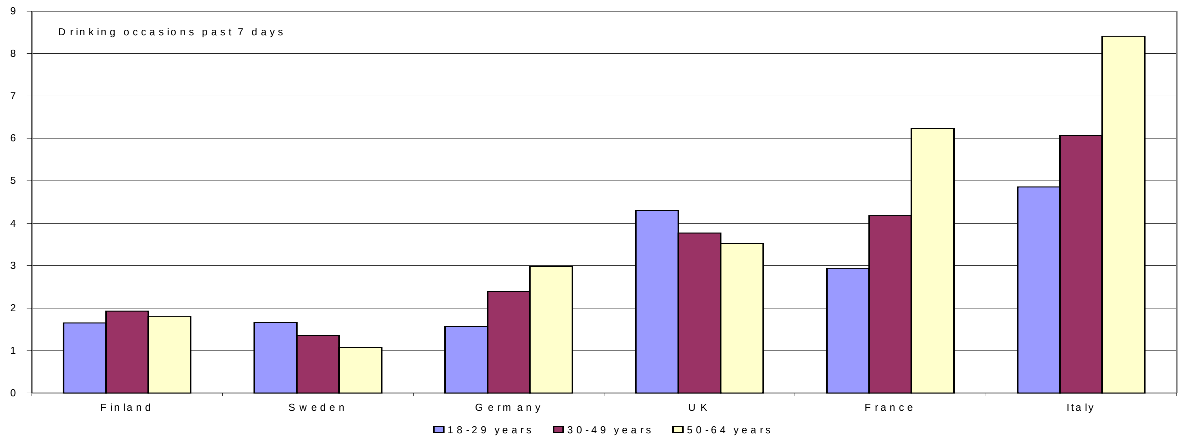
According to the survey data for 2000, the frequency of drinking increases with age in France and Italy in particular, but also in Germany, and most likely in Sweden and among Finnish men (Figures 3-4). This seems not to be the case in the UK, where the results suggest that the youngest drink as often or even more often than their elders.

Table 2. Frequency of drinking situations[1] according to surveys in 1988 and 2000.

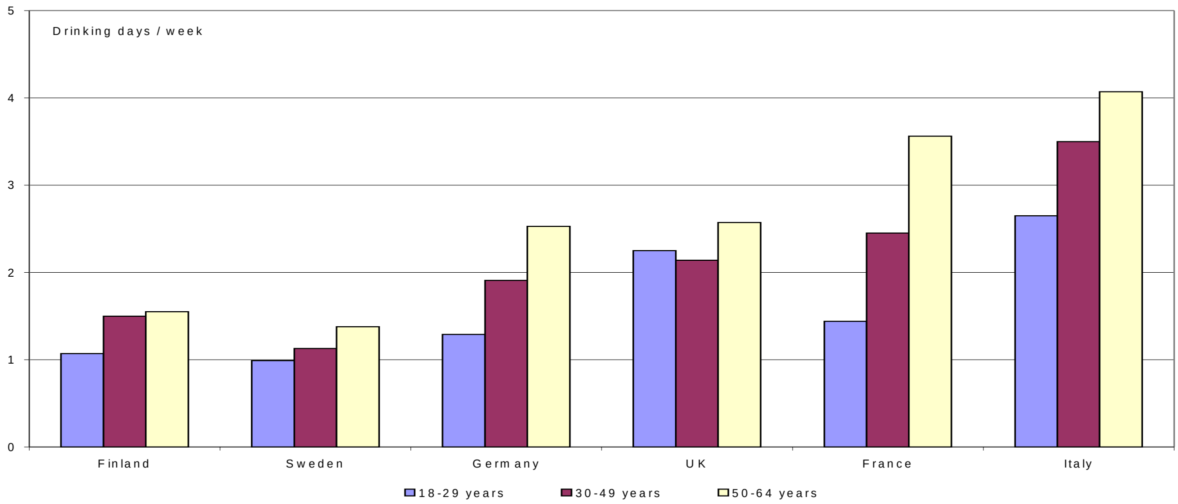
	Men				Women			
	1988[2]		2000[3]		1988[2]		2000[3]	
	Frequency (situation/ week)	Index 100= Total	Frequency (situation/ week)	Index 100= Total	Frequency (situation/ week)	Index 100= Total	Frequency (situation/ week)	Index 100= Total
Finland[4]	1.4	33	2.3	68	0.9	38	1.3	65
France	6.5	155	4.1	121	3.6	150	2.2	110
Germany	5.0	119	2.9	85	2.8	117	1.7	85
Italy	6.5	155	5.1	150	4.1	171	3.4	170
Sweden[5]	1.8	43	2.1[6]	62	0.8	33	1.0[6]	50
UK	4.1	98	3.9	115	2.5	104	2.4	120
Total	4.2	100	3.4	100	2.4	100	2.0	100

[1] Sum of frequencies of beer, wine and spirits for each respondent.
[2] 1988 survey, see Hupkens *et al.*, 1993
[3] The ECAS survey conducted in Spring 2000, according to the frequencies in the QF-scale.
[4] Finland: mean of 1984 and 1992 (calculated from Simpura, *et al.*, 1993).
[5] Survey conducted in Spring 1990 by SIFO with face-to-face interviews with a random sample of 1111 in the ages 16-75. (ages 18-64; N=1035).
[6] Including so called ordinary strength beer (2.8-3.5% alcohol by volume)

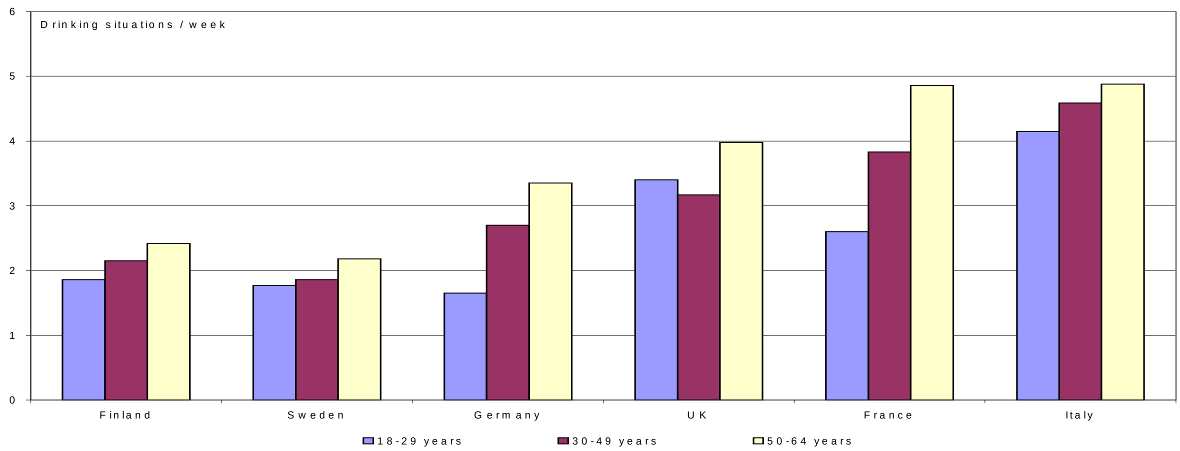
Figure 3. *Three measures of drinking frequencies. Men in three age groups. Weekly mean values.*



Drinking occasions per week (number of drinking occasions during the past 7 days. Maximum: 28 occasions)

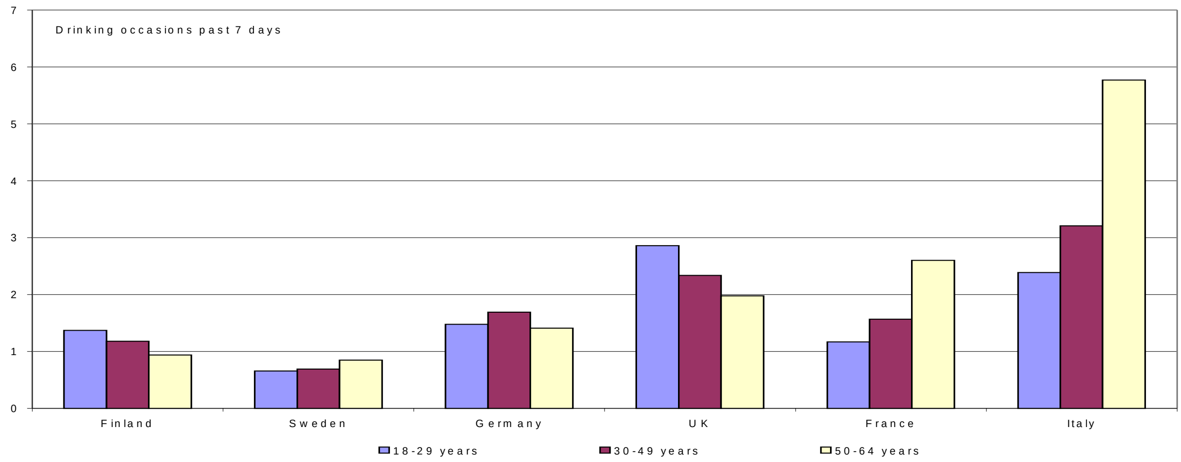


Drinking days per week (minimum value: frequency of consuming the most frequently consumed beverage)

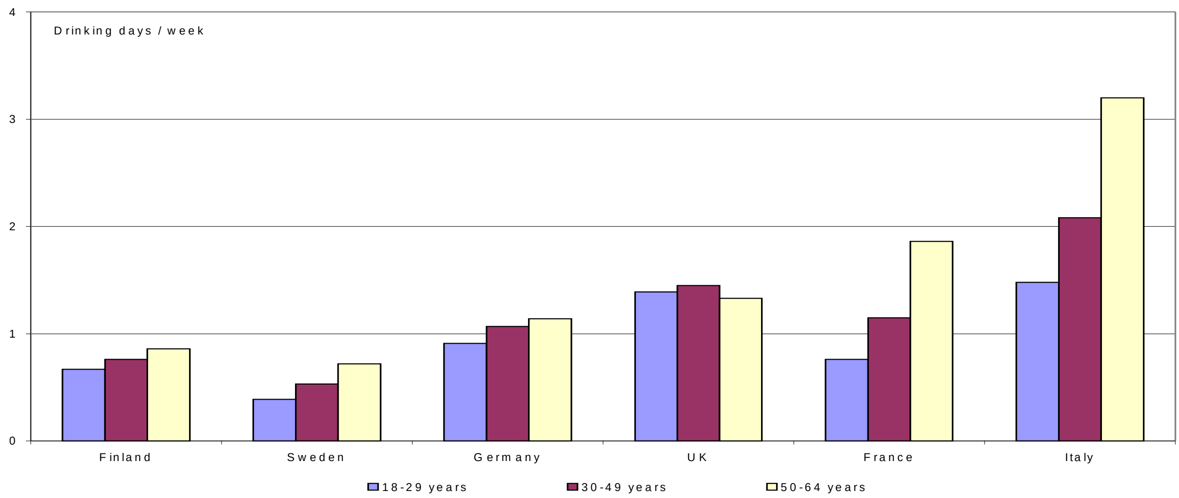


Drinking 'situations' per week (maximum value: sum of the frequency for each alcoholic beverage)

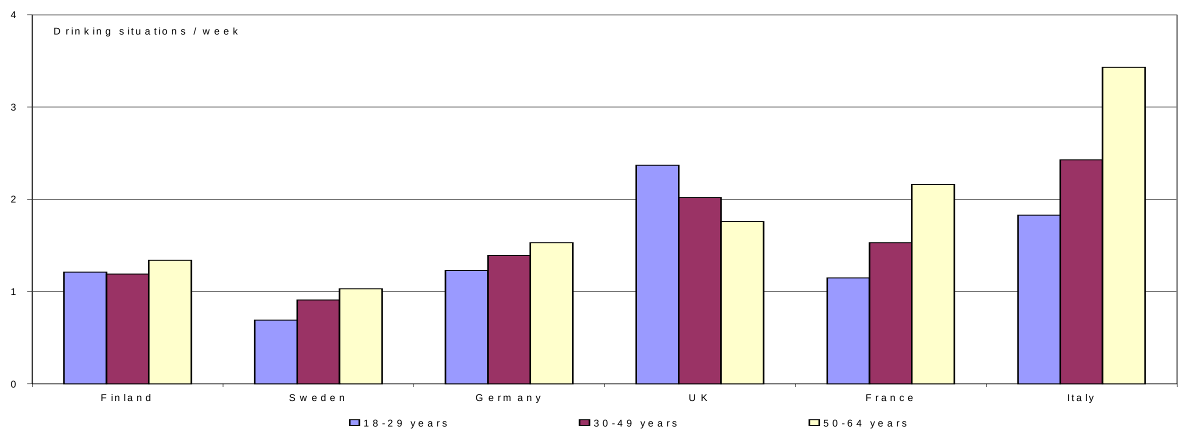
Figure 4. *Three measures of drinking frequencies. Women in three age groups. Weekly mean values.*



Drinking occasions per week (number of drinking occasions during the past 7 days. Maximum: 28 occasions)



Drinking days per week (minimum value: frequency of consuming the most frequently consumed beverage)



Drinking 'situations' per week (maximum value: sum of the frequency for each alcoholic beverage)

2.3. Drinking quantity per drinking occasion

The quantity of alcohol consumed per drinking occasion differs between the EU countries. However, here the highest quantities are generally found in Northern Europe and the lowest in Southern Europe. This can be seen in Table 3, which shows the average quantities per drinking occasion for all beverages combined (sum of all alcoholic beverages) for the six countries. For both men and women, at all ages, the highest consumption per drinking occasion is found in the UK, Sweden and Finland.

Shifting the focus to age differences, the table shows that in all countries, except Italian women, the youngest show the highest quantity. For Italian women, the highest quantity is found among the middle age group. The biggest percentage difference between the youngest (18-29) and their elders is found in Finland, Sweden and the UK. However, the age differences differ for the different alcoholic beverages. For wine, the volume per occasion shows a rather similar level across ages, although, in most cases, there are somewhat higher quantities in the middle age group. In contrast to wine, both beer and spirits show in most countries, and both genders, the highest quantity per occasion among the youngest.

Table 3. Drinking volume per drinking occasion for all alcoholic beverages combined (the sum of all beverages)[1] among men and women in different age groups.

Volume per occasion (centilitre 100% alcohol)	Finland	France	Germany	Italy	Sweden[2]	UK
Men:						
18-29	23.2	9.9	9.7	5.9	23.5	17.7
30-49	17.1	8.2	9.3	5.4	16.2	13.3
50-64	14.7	6.2	7.2	4.7	9.8	14.4
Total	18.5	8.4	8.9	5.3	16.7	14.4
Women:						
18-29	12.8	4.5	7.0	3.8	12.2	11.8
30-49	10.2	4.0	5.5	4.4	8.0	8.6
50-64	8.1	2.9	4.6	3.3	6.1	5.6
Total	10.1	3.8	5.6	3.9	8.7	8.5

[1] Sum of beer (including class II beer in Sweden), spirits, wine and cider
[2] Not including beer class II.

2.4. How often one drinks large quantities at one and the same occasion: drinking to intoxication (binge drinking)

The ECAS review of surveys on drinking patterns showed that are no comparative European data which could be constructed on the trends in the prevalence of binge drinking, information which is of crucial importance when considering the links between alcohol consumption, drinking patterns and alcohol-related harm. The few existing national studies available suggest, however, that qualitative features like binge drinking are not prone to change quickly (see Simpura & Karlsson, 2001). The ECAS survey sheds some light on differences today between the six EU countries. In line with the average quantity per drinking occasion, also the number of heavy drinking occasions, and the proportion of heavy drinking occasions to all drinking occasions, show a north-south gradient, with the highest intoxication-oriented drinking in north and the lowest in south (Table 4).

As shown in Table 4, the north-south gradient is visible both for men and women. The mean number of heavy drinking occasions per 12 months differ substantially between men and women and different age groups. Generally, the men report approximately 3 to 4 times more heavy drinking occasions than the women.

Age differences in heavy drinking (intoxication)

There is a growing concern about adolescent drinking in many countries. One reason for this concern is reports of increased drinking to intoxication and binge drinking in young people across Europe. This drinking pattern is now also reported in countries in which drunkenness has not been a central part of their traditional drinking pattern, e.g. the Mediterranean countries. A compilation of most of the existing reports on young people in the EU countries, presented in Table 5, shows that there are indications of increased intoxication-oriented drinking among young people in most EU countries during the 1990s, or to be precise in 10 of the 14 countries investigated. In one country, Italy, drunkenness decreased, in another (Portugal) it was stable and in two others, Germany and Spain, no data was available on young peoples' drunkenness. However, in Spain the proportion drinking alcohol among 14-18-year-olds remained stable between 1994 and 1996 and in Germany the proportion of 12-25-year-olds drinking alcohol was reduced in the 1990s. It should be stressed also that the frequency of intoxication-oriented drinking does not follow the same age distribution as mean alcohol consumption. In all countries, except Italy, the youngest reported a higher frequency of intoxication and in all countries the young contribute to a large proportion of the total compared to the mean alcohol consumption.

Table 4. Proportion of binge drinking to the total number of drinking occasions, by gender.

Country	Mean number of binge drinking occasions per year	Percentage binge drinking occasions of all drinking occasions (occasions past 12 months)[1]	Percentage binge drinking occasions to all drinking occasions (past 7 days 52)[2]
Men:			
Finland	20	29	22
France	11	9	5
Germany	14	14	11
Italy	23	13	7
Sweden	12	33	17
UK	47	40	24
Women:			
Finland	6	17	10
France	3	5	3
Germany	4	7	4
Italy	14	11	7
Sweden	4	18	11
UK	16	22	13

[1]Based on the alcohol beverage most frequently drank for each respondent.
[2]Sum of number of drinking occasions past seven days at lunchtime, during evening/late afternoon meal, at a restaurant or a bar, at home, but not in connection with meals. The sum is multiplied with 52. The highest possible number of occasions per week is thus 4*7=28.

Table 5. Available information on drinking habits and trends in drinking among young people in each EU Member State during the last 10 years.

Countries

Austria:
There are no data available that permit a study of the trends in alcohol consumption. A large national survey study was conducted 1993-94 including more than 10 000 respondents (Uhl & Springer, 1996). The highest weekly consumption and prevalence of high consumers was met in the age group 40 to 49 years for men and women. Next highest consumption was reported by the 50-59 years of age followed by the age group 30-39. The 20-29 age group reported somewhat lower consumption and prevalence of high consumers than those aged from 30 to 39 The youngest (16-19) showed the lowest consumption of all ages, even lower than the oldest age group (70+).
A comparison between the WHO HBSC[1] surveys 1994 and 1998 showed a small decrease (3%-4%) among 15 year olds in the proportion drinking alcohol at least once but an increase in those being drunk at least twice or more (boys: +3%, girls + 6%). In 1998, 39% of the boys and 23% said that they drank at least weekly. For the boys this is somewhat higher than the average for the participating EU MS, for the girls almost the same. The corresponding percentages of drunkenness was 49% and 36% respectively, also here higher than the average for the boys, and somewhat above the average for the girls.

Belgium:
School surveys have been conducted every second year from 1994 in the ages 11-12, 13-14, 15-16 and 17-18. The 1994, 1998 and 2000 were part of the WHO HBSC study.
Data on weekly drinking of alcoholic beverages 1990-98 show a fairly stable proportion of weekly drinkers in all four age groups, although possibly a slight decrease among boys in the different age groups.
The experience of drunkenness from 1994 to 2000 shows a rather stable pattern for boys, however if any change, the proportion has increased in the 15-16- and 17-18-year-olds. As concerns girls, the 17-18-year-olds show a clear increase from 24% 1994 to 38% 2000. Also the 15-16-year-olds show an increase, from 16% 1994 to 20% 2000. The changes among the youngest groups are small (Faculteit Geneeskunde Vakgroep Maatschappelijke Gezondheidkunde, 2000).

Denmark:
According to the ESPAD-study[2] the 15-16 years old in Denmark not only showed the highest prevalence of drinking in Europe but also an increase between 1995 and 1999. For example, 1995 45% or the boys and 34% of the girls has used alcoholic beverages 20 times or more during the past 12 months. In 1999 the proportions had increased to 60% and 39% respectively which are the highest proportions of all countries. Also the measure of intoxication drinking was among the highest and increased between 1995 and 1999.
Furthermore, the 15-16 years old Danes also showed the highest proportion of students who had used alcohol before or at the age of 13 (beer: 76%, wine: 66%, spirits: 58%) and the highest proportion who had been drinking alcohol during the last 12 months (96%)
The HBSC-data 1994 and 1998 also showed an increase in weekly drinking and drunkenness among 15 year olds boys and girls.
An survey in 1996 showed small differences in consumption between young adults (19-34) middle aged (35-54) and elderly (55-71) both among men and women.

Finland:
The proportion of young people in the ages 12, 14, 16 and 18 drinking at least once a week (or once a month) have, by and large increased gradually during the 1990s among both boys and girls.
The number of boys and girls in all these four age groups engaging in hard drinking (weekly and monthly) increased from 1985 onwards (with a decline between 1993 and 95).
Analyses of survey data from 1992, 1993 and 1996 showed that the 18-29-year olds consumed approximately the same amounts as the 30-49 year olds and higher than the oldest oldest (50-69 year) (Metso & Simpura, 1997). The ECAS-survey[3] showed a somewhat higher consumption level for the 18-29 yeas olds than the elder.

Table 5, continued

France:
Data from school surveys in Paris shows that the percentage abstainers remained rather stable between 1983 and 1991 (approx. 22%) but increased from 1991 to 1998 (28%) (OFDT, 1999). The proportion reporting that they usually drink at least 3 glasses, 5 glasses and 6 glasses remained stable between 1991 and 1998 (not asked 1983). The experiences of drunkenness (once, 3 times and 6 times last 6 months) increased between 1983 and 1991. Between 1991 and 1998, no consistent pattern emerges: life-time prevalence of drunkenness showed a slight decrease, the prevalence of drunkenness 3 times a slight increase whereas drunkenness 6 times or more during past 6 months showed exactly the same prevalence.
The HBSC surveys among 15-year-olds showed reduced proportion of weekly drinkers between 1994 and 1998 (boys: - 9%; girls: -3%) but an increase in the proportion being drunk at least twice (boys + 5%, girls + 7%.)
According to ESPAP-data 1999, French 15-16-year-olds showed lower prevalence of drinking frequencies and drunkenness than the average for the EU Member States in 1999.
ECAS survey showed that the mean consumption was lowest in the youngest age group (18-29 years old) compared to the 30-49 and 50-64 year olds. The difference between the two latter was small.

Germany:
The proportion of 12-25-year olds drinking alcoholic beverages has decreased in the 1990s. For example, in 1989 37% drank beer at least once a week, in 1997 27%. The same trend goes for wine and spirits (BZgA, 1998). A large general population survey in the ages 18-59 years conducted 1997 (Kraus & Bauernfeind, 1998) showed that the prevalence of high consumers increased by each age group and was highest in the 40-59-year olds women and men. The ECAS-survey confirm this picture for men but not for women where the 18-29 year-olds drank the most.

Greece:
Surveys on school students aged 14-18 have been conducted 1984, 1988 and 1993 and among the general population 12-64 years old in 1984 and in 1993. Alcohol consumption declined in the period 1984 to 1993, both in the general population and among the students with the exception of young adults aged 18-24. The same pattern was found between 1984 and 1993: a decrease in the general populations with the exception of the 18-25-year-olds (Kokkevi & Stefanis, 1994).
Also heavy drinking (5 or more drinks in a single occasion) declined between 1984 and 1993 in the general population with the exception of the age group 25-35 in which the prevalence of heavy drinking doubled. The data over time also revealed changes in the pattern of alcohol among young adults who are to an increasing extent consuming spirits (Kokkevi & Stefanis, 1994).
In the HBSC study 1998, Greece shows one of the highest proportion of weekly drinkers among 15 years old (boys: 42% , girls: 21%) but one of the lowest of proportion of boys and girls being drank at least twice. The ESPAD 1999 data show the same result: higher proportion of drinkers than the average but lower proportion reporting being drunk.
There are some evidence that the consumption is lower among the youth and young adults: one study showed that frequent alcohol use (20+ during preceding month) was highest in the age group of 36 years or older. Binge drinking, however, has been shown to be most frequent among the young adults (see Simpura & Karlsson, 2001).

Ireland:
The students in the ESPAD 1999 report generally higher frequencies, especially when it comes to the number of drunkenness and binge drinking frequencies. Further, the frequencies of drinking and drunkenness have increased between 1995 and 1999. The proportion being drunk at the age of 13 or younger also show an increase.
The HBSC-1998 data, however, does not show the same pattern. On the contrary, the percentage of 15-year-olds show proportions lower than the average of weekly drinkers and of those reported being drank at least twice.

Italy:
In ESPAD-1999, drinking frequency seems to be somewhat lower than the average among the EU MS and frequency of drunkenness substantially lower. In addition, both the frequency of drinking and of drunkenness showed a marked decline between 1995 and 1999.
According to the ECAS-survey, the youngest (18-29 years of age) reported the lowest per capita consumption. As for men, the highest consumption was found among the 50-64-year- olds, among women among the 30-49-year-olds. Also the frequency of heavy drinking occasions was the lowest in the youngest age group.

Table 5, continued

Netherlands:
Data on school children show an increase in heavy drinking in each age group from 12 years of age (12-13, 14-15,16-15, 18+). In all age groups the proportion drinking 5-8 or more than 8 glasses during the last drinking occasion increased between 1988 and 1996 (de Zwart, *et al.*, 1997). The lifetime prevalence of alcohol showed a decline between 1988 and 1992 but then an increase from 1992 to 1996, especially in the youngest age groups (10-11 and 12-13 years). Alcohol use during the last four weeks also went up in 1996 compared to 1992. All age groups except the 10-11-year-olds contributed to this (de Zwart, *et al.*, 1997).
General population data show rather little association between age and alcohol consumption, both for men and women (see Simpura & Karlsson, 2001).

Portugal:
According to the ESPAD, approx. 75% of the 15-16-year-old students had been drinking alcohol during the past 12 months which is lower than the EU average. Heavy drinking and drunkenness is much lower than the average. There are no signs of an increase or decrease between 1995 and 1999 neither in prevalence of drinking , nor in heavy drinking.
National studies of the prevalence of drinking during life-time, 12 months and last 30 days for school children of different ages (7-9th grades, 10-12th grades) show small changes during the first half of the 1990s. (IPTS, 2001).

Spain:
In 1994 and 1996 national school surveys on drugs and alcohol were conducted in the age group 14-18 years. Among the 14-year-olds, the proportion been drinking during the last two months was reduced somewhat between 1994 and 1996 (67.3% to 64.3%) and was stable among the 16-year olds (87% both periods) and among the 18-year-olds (92% and 93%) (Plan Nacional Sobre Drogas, 1996).

UK:
Data from different studies on different age groups among adolescents and young adults all show increases in prevalence of drinking (e.g. last week) high consumers and mean alcohol consumption. For example:

- the mean alcohol consumption among boys and girls aged 11-15 increased from 0.8 in 1990 to 1.8 units in 1996. If non-drinkers were included, the increase was from 5.4 to 8.4 units a week (Goddard, 1997).
- The General Household Surveys (GHS) show an increase from 1990 to 1996 in the proportion of young adults drinking more than 21 units a week: among women from 16% to 22% among mean from 31 to 35% (Statistical bulletin, 1999).
- ESPAD-data show an increase in frequency of drunkenness and in prevalence of drinking between 1995 and 1999 among 15-16 year-olds. In 1995 and even more in 1999, the UK show among the highest figures in most in all the drinking measure, e.g. binge drinking, drunkenness, lifetime and 30 days prevalence of drinking.
- In 1996, 29% of 12-13 year old boys and 26% of girls admitted drinking alcohol in the past week. By 1999, these proportion had risen to 38% and 30% respectively (Royal College of Physicians, 2001).

Several surveys (e.g. GHS, ECAS-survey) show that the youngest age group (GHS: 16-24, ECAS: 18-24) show the highest mean alcohol consumption, the highest prevalence of heavy drinkers and frequency of binge drinking.

Sweden:
Data from surveys among school students (aged 15-16 years) and 18-19-year-old men conscripted for military service show higher consumption and prevalence of drinking in the 1990s compared to the 1980s. The increase among 15-16-year-olds occurred especially during the first half of the 1990s. The number of heavy drinking occasions seem to have increased more or less continuously throughout the 1990s both among 15-16 year-olds and, especially among the conscripts.
The surveys conducted in the 1990s, all show that the young adults drink the most in volume as well as showing the highest prevalence of heavy drinking occasions and drunkenness, both among men and women.

[1] see e.g. Settertobulte, 2001
[2] see Hibell, *et al.* 2001
[3] see Leifman, et al., 2001a

2.5. Where do people drink: the context of drinking

Drinking is more concentrated in the weekends in Central Europe and especially Northern Europe than in the Mediterranean countries. However, all countries have been influenced by the introduction of a five-day weekly working schedule (Simpura & Karlsson, 2001). Figure 5 shows how common it is to drink in different contexts: at lunchtime, at dinner (afternoon/ evening meal), at a bar/restaurant and at home but not in connection with any meal in the six EU countries in different age groups. Drinking alcoholic beverages at lunch is the most common in France and Italy and the least common in Finland and Sweden. Drinking at restaurants/bars and at home but not in connection with meals is the most common in the UK. Also drinking at restaurants/bars is the least common in Finland and Sweden whereas drinking at home, but not in connection with meals, is the least common in Southern Europe.

Table 6 shows the relative distribution between these four types of drinking occasions within each country, specified by gender. The table clearly visualises the differences between the two southern European countries and the remaining four. In France and Italy, drinking occasions in connection with lunches and dinners contribute to 75% and 82% respectively of all drinking occasions related to these four drinking contexts. In Germany, Sweden and the UK, lunch and dinner drinking occasions amounts to roughly 50%, and in Finland to no more than one third with especially low proportions for lunch drinking in all four. Finland shows by far the higher proportion of drinking occasions at home but not in relation to a meal. These country differences hold true for both men and women

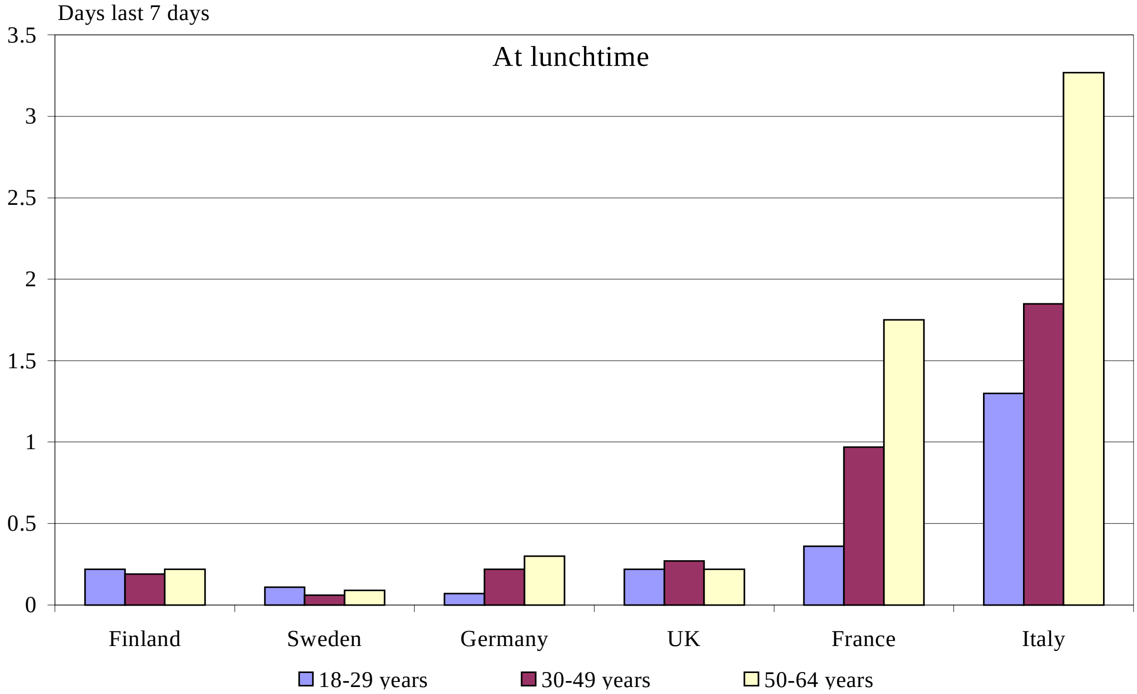
Age and gender differences

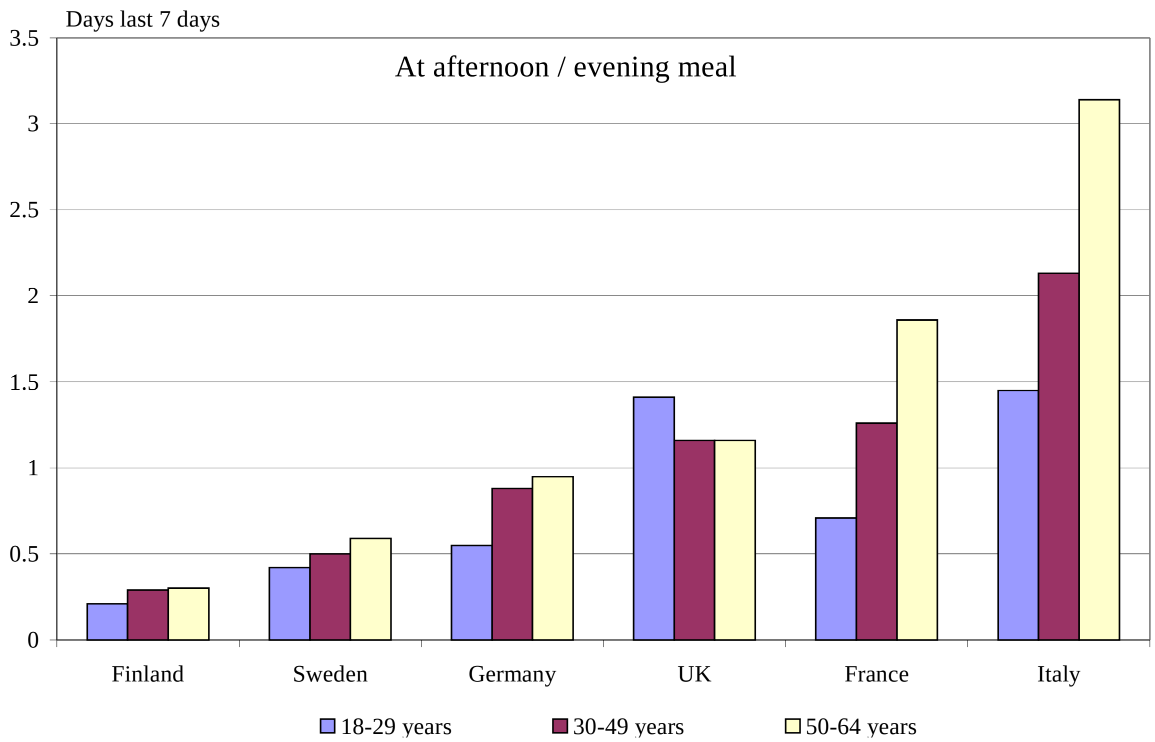
In most countries, drinking alcoholic beverages at lunchtime and at dinner become more common with age whereas the opposite is true for restaurants/bars. Drinking at home but not in connection with meals show different age distributions in the different countries. By and large, men report higher frequencies than women in all six countries in all four contexts. The distribution between the four drinking contexts, however, showed some differences between men and women. This is shown in Table 6. It appears as if lunch and especially dinner drinking occasions contribute to a larger proportion of all drinking occasions for women than for men in most countries whereas the opposite may hold true for drinking occasions at restaurant/bars and/or at home but not in connection with meals. These differences are not very dramatic, however.

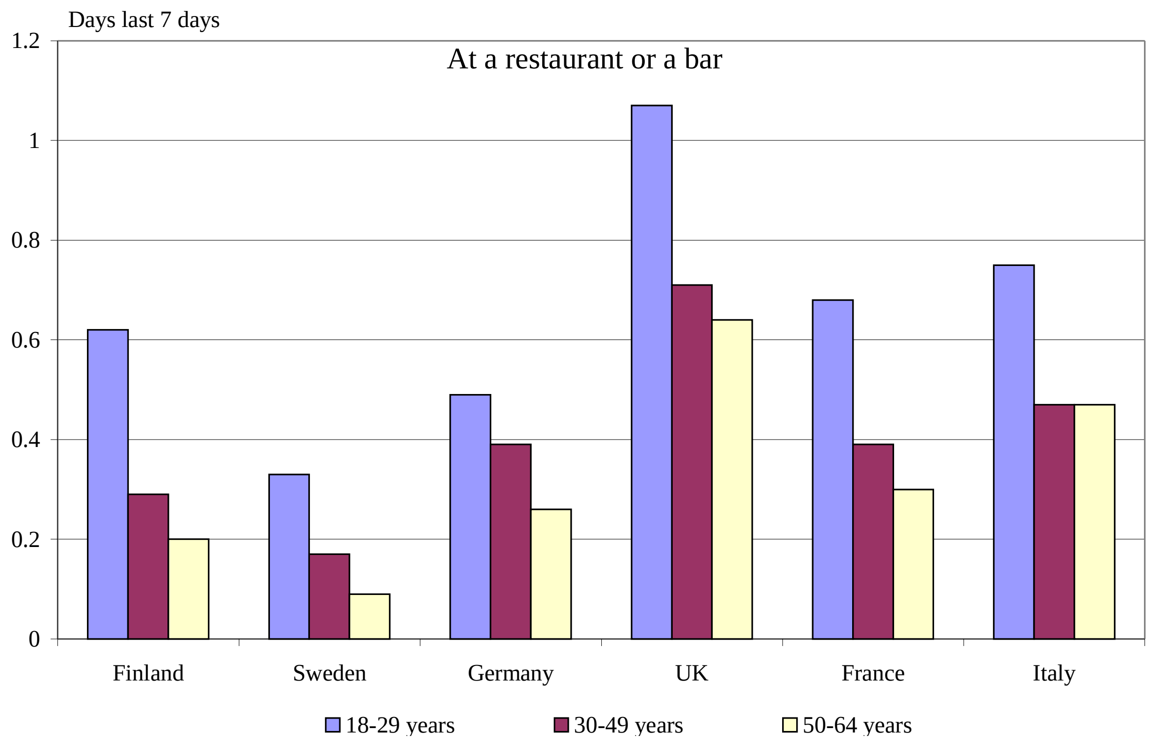
Table 6. The distribution of four different settings of drinking <u>in percent</u>.

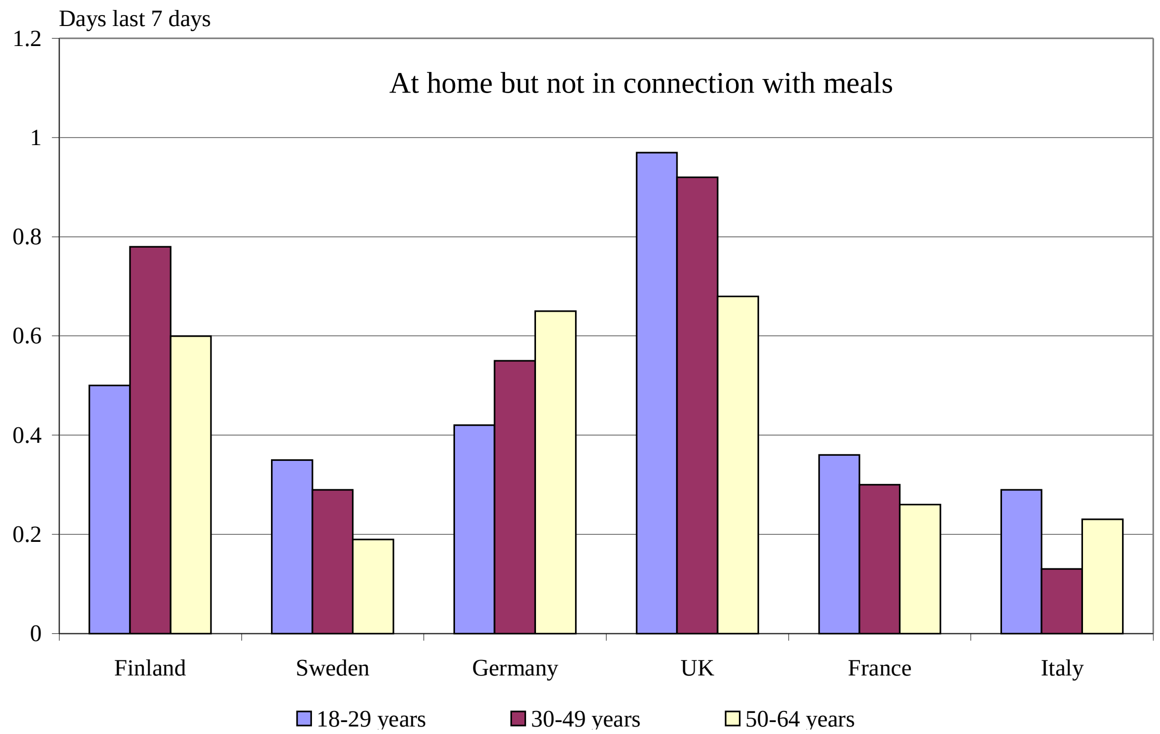
Countries		Lunch	Afternoon/evening meal	Restaurant / bar	Home but not in connection with meals
France:	Men	31	40	17	13
	Women	37	46	11	5
Italy:	Men	40	44	12	5
	Women	46	44	7	3
Germany:	Men	12	40	18	29
	Women	7	44	22	26
UK:	Men	10	36	27	28
	Women	5	45	22	28
Finland:	Men	14	15	26	46
	Women	15	23	20	42
Sweden:	Men	9	41	20	31
	Women	5	60	16	18

Figure 5. *Drinking occasions at different contexts during last 7 days in six countries by age.*






Days last 7 days
At a restaurant or a bar
1.2
1
0.8
0.6
0.4
0.2
0
Finland
Sweden
Germany
UK
France
Italy
18-29 years
30-49 years
50-64 years


Days last 7 days
At home but not in connection with meals
1.2
1
0.8
0.6
0.4
0.2
0
Finland
Sweden
Germany
UK
France
Italy
18-29 years
30-49 years
50-64 years

3. ANALYSES OF ALCOHOL-RELATED PROBLEMS

The consumption of alcoholic beverages is estimated to be responsible for some 10% of the total disease burden (Disability Adjusted Life Years: DALY) and some 5% of total years of life lost (YLL) in the Established Market Economies (i.e. Western societies and Japan). Although associated with a substantial degree of uncertainty, cost analyses of alcohol consumption have clearly shown that the direct costs of alcohol consumption (value of goods and services delivered to the harmful consequences of alcohol consumption) fall short of the indirect costs, that is the values of personal productive services that are not performed due to the negative consequences of drinking (Gutjahr & Gmel, 2001). In Western societies, the social costs of alcohol consumption have been estimated to amount to between 1-3% of the GDP. In monetary terms, the costs of alcohol consumption in EU in 1998 have been estimated at between US$ 64 939 and US$ 194 817 million. About 70% of these costs are estimated to be indirect costs (Gutjahr & Gmel, 2001).

This chapter reports on ECAS-studies of the effects of alcohol consumption on mortality at the population level and self-reported alcohol-related problems measured in the six countries included in the ECAS-survey. Also some results from the European School Survey Project on Alcohol and Drugs (ESPAD) among 15-16- year old students will be presented. Most of these alcohol-related consequences would fall under the category of direct costs. Indirect costs are even more difficult to estimate. The most important of the indirect consequences, however, are discussed under the section concerning the effects of alcohol-related problems on working life.

3.1. Mortality and population drinking

Most of the literature on alcohol and mortality is concerned with the individual level relationship. The ECAS, however, addressed instead the population (aggregate) level. Rather than asking, "to what extent does alcohol affect the individual's mortality risk?" the question was "to what extent do changes in overall alcohol consumption in society have an effect on mortality rates?" It was argued that this kind of analyses, i.e., based on aggregate time series data, is the most feasible approach for addressing questions that concern the overall public health consequences of changes in population drinking (Norström & Skog, 2001). Alcohol-related mortality is the only indicator that meets reasonable standards of comparability, although these are far from unproblematic. The following forms of mortality were considered during the post-war period in the study countries (EU countries except Luxembourg but including Norway):

- liver cirrhosis mortality
- explicitly alcohol-related mortality (alcoholism, alcohol psychosis, alcohol poisoning and the four new alcohol-related diagnoses that were introduced in ICD 9; viz., alcohol misuse, alcoholic gastritis, alcoholic cardiomyopathy and alcoholic polyneuropathy).
- accident mortality

- suicide
- homicide
- ischemic heart disease (IHD)
- all-cause mortality

The rationale of selecting a broad range of mortality indicators was to obtain a comprehensive assessment of the impact of population drinking on mortality. Although cirrhosis mortality is the classical indicator of harmful effects of chronic heavy consumption, the category "explicitly alcohol-related mortality" should be seen in the same way. Accident mortality is more likely to be linked to episodic intoxication drinking, thus reflecting acute consequences of consumption. Suicide and homicide "...can be regarded as extreme expressions of, respectively, self-destructive and aggressive behaviours which are either unrecorded or poorly recorded, and thus not amenable to statistical analyses, but which are nevertheless likely to be influenced by drinking." (Edwards *et al.*, 1994, p. 99.) The cardioprotective effect of alcohol that is suggested by numerous individual level studies warrants analyses of how IHD-mortality responds to changes in per capita consumption to see if any positive health effects can be discerned at the population level. Considering that alcohol may have positive health consequences in addition to the negative ones, it is of interest to assess the net effect of drinking. A feasible way of doing that is to focus on a global outcome, i.e., all-cause mortality.

The results of analyses of the effect of one-litre increased consumption can be summarised as follows (for estimates, see Norström, *et al.*, 2001):

An increased alcohol consumption leads to:

- an increase in cirrhosis or AAA in every country
- an increase in accidents, homicides and total deaths in half of the countries
- an increase in suicides in the northern European countries
- no increase or decrease in heart disease mortality
- generally stronger effects in the northern European countries

By and large, the results from these analyses confirm the importance of per capita consumption; in each country alcohol-related mortality (cirrhosis or AAA-mortality) responds to changes in total consumption. However, for most outcomes there is a geographical gradient in the alcohol effect, so that it is stronger in Northern and weakest in Southern Europe, suggesting a modifying impact of drinking culture and its drinking patterns. A succinct expression of this is the link between alcohol and suicide; it is quite marked in Northern Europe, but weak or non-existent in South and Central Europe.

One interpretation of this pattern is that the more the use of alcohol is culturally integrated, the less excessive intake gives rise to social problems and disintegration. The one relationship that was invariant across countries as well as different age groups of men and women was thus the zero-correlation between alcohol and ischemic heart disease mortality. This suggests that an increase in per capita consumption does not provide any cardioprotective effect at the population level. In this context it may also be noted that the relationship between alcohol and total mortality was significantly positive in the majority of the study countries; in no country were increases in consumption significantly associated with decreases in mortality.

3.2. Self-declared alcohol-related problems

In order to measure the prevalence of current drinking problems in different life-areas, the following eight items were asked as a series in the six countries. Have you ever during the last 12 months:

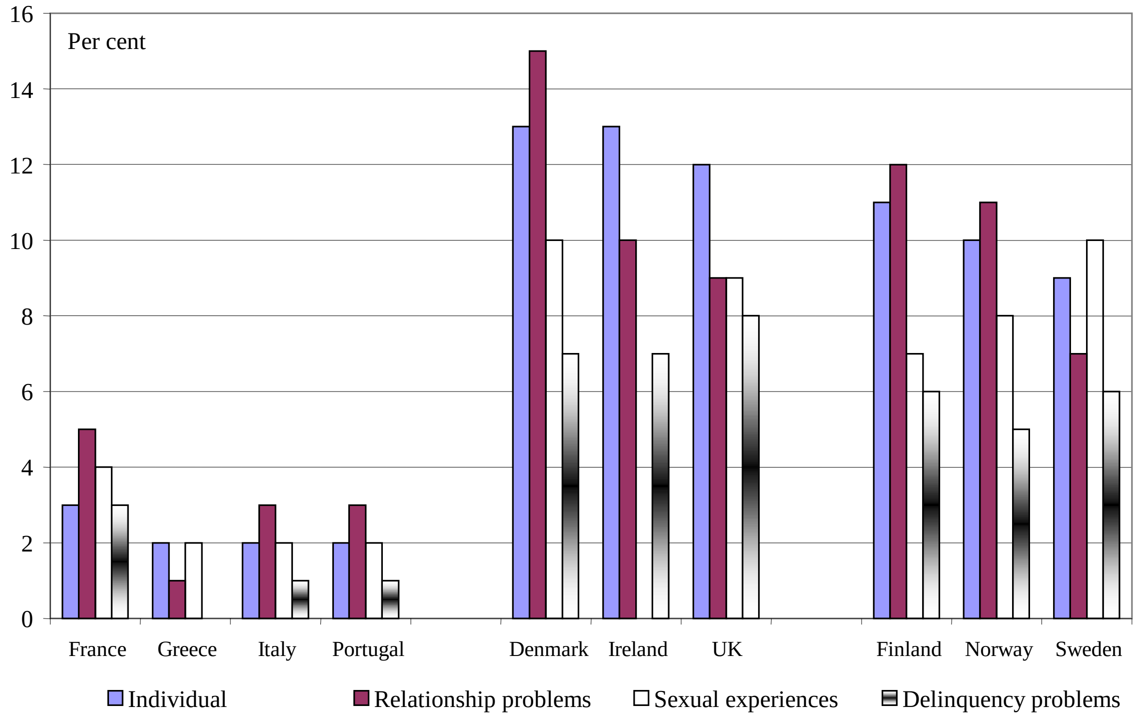
- Got into a fight when you had been drinking?
- Been in an accident of any kind when you had been drinking?
- Ever felt that you should cut down on your drinking?
- Regretted something you said or did after drinking?
- Felt that your drinking harmed your home life or marriage?
- Felt that your drinking harmed your work or studies?
- Felt that your drinking harmed your friendship or social life?
- Felt that your drinking harmed your health?

These questions can be grouped into four types of alcohol problems: consequences from prolonged drinking, behavioural concomitants of drinking, consequences of single drinking occasions, and social relations to drinking. For methodological reasons, the studies based on the ECAS survey data have been cautious in comparing absolute figures, such as differences in the prevalence of self-reported alcohol problems. Bearing this in mind, the findings show that the proportion of male respondents reporting at least one of these eight alcohol-related problems during the past 12 months is the highest in Finland (44%), the UK (40%) followed by Sweden (33%) and Germany (29%). Frenchmen and Italian men thus show the lowest prevalence (24% and 16% respectively). Also among women, the UK (28%) and Finland (26%) show the highest proportion and France and Italy the lowest (9% and 7% respectively) with Germany and Sweden in the middle (16% in both) (see Ramstedt, 2001).

Analyses within each country revealed that these self-perceived alcohol-related problems were positively connected to both the quantity of consumption and the frequency of intoxication drinking. In no country was it possible to establish any threshold, below which any kind of problem was not reported. Some findings, suggest also here that the southern European drinking culture has a weaker link to adverse consequences, the most recurrent example was Italy.

The 1999 ESPAD included questions of self-experienced problems caused by alcohol problems. The problems can be divided into four groups: individual problems, relationship problems, sexual experiences and delinquency problems (scuffle or fight, victimised by robbery or theft, trouble with police). Figure 6 shows the how common it is in 10 European countries. The boys and girls in the traditionally wine drinking countries in Southern Europe show significantly lower proportions which have experienced the alcohol-related problems mentioned compared to the beer drinking countries Denmark, Ireland, the UK and the former spirits drinking countries Finland, Norway and Sweden. The differences between these two latter groups of countries are quite small with one exception: Denmark. In three out of four problem categories, Danish boys and girls report the higher proportions of alcohol-related problems.

Figure 6. *Experienced problems among 15-16 year old student in 10 countries. Average percentage points in four groups of problems[1] (Source: Hibell, et al., 2001).*



[1] The items were the following: individual problems (performed poorly at school or work, damage to objects or clothing, loss of money or other valuable items, accident of injury, hospitalised or admitted to an emergency room), relationship problems (quarrel or argument, problems in relationships with friends, problems in relationships with parents), sexual experiences (engaged in sex you regretted the next day, engaged in unprotected sex), delinquency problems (scuffle or fight, victimised by robbery or theft, trouble with police).

Age distribution

The frequency of self-perceived alcohol problems follow in broad terms the same age distribution as was reported for intoxication drinking. In surveys conducted in the Anglo-Saxon and the Nordic countries, the youngest age group (adolescents and young adults) generally report the highest number of self-experienced alcohol-related problems (e.g. Midanik, 1995; Mäkelä, *et al.*, 1999). In the six EU-countries included in the ECAS-survey, the youngest age group (18-29) reported the highest number of intoxication occasions, but this concentration to young people was the least marked in France and especially

Italy. It is thus likely that the age differences in self-reported alcohol-related problems is strongest in those countries with the most marked age differences in drinking to intoxication, i.e. the Nordic countries and the UK. However, even in Southern Europe the perceived alcohol problems, as well as intoxication drinking, show a stronger shift towards younger ages than do mean alcohol consumption. In other words, in many of the EU Member States, young people contribute to a larger proportion of problems than what can be predicted from the per capita alcohol consumption. One likely cause is the frequency of intoxication drinking which is often highest among young people.

Gender distribution

Also here, there were signs of country differences with the lowest gender difference in the UK, Finland and Germany and the largest difference in Southern Europe: France and Italy. In the UK, Germany and Finland, men reported 1.6-1.9 times higher number of alcohol problems, in France and Italy 3.6 and 2.9 respectively.

3.3. Drinking and driving

Despite increased efforts to reduce the prevalence of drinking and driving, however, alcohol is still an important contributory factor for accidents on European roads. In the countries most severely affected, alcohol is a contributory factor in 40-50 per cent of all road accidents with a fatal outcome.

Risks associated with alcohol consumption on accidents and alcohol-involvement in accidents

The effects of alcohol consumption on driving impairment and traffic accidents are well documented in the scientific literature (see e.g. English *et al.*, 1995). Experimental studies have shown that impairment is greater for complex driving tasks than for simple ones and that driving performance is reduced for at least three hours after alcohol has been eliminated from the blood (Donelson & Beirness, 1985). Laboratory studies have shown that minimal impairment in performing a simulated driving test can be detected at BACs of 0.2-0.3‰ (per mille) and that there is a clear risk over 0.5‰.

However, experimental studies do not directly indicate the impairment of driving ability in real life. One of the most influential study is the case-control Grand Rapids study. It was shown that the proportion of drivers with a BAC of 1‰ or more involved in serious non-fatal traffic accidents was 11.3%, while the proportion among drivers with a disabling injury was 6.7%, compared to 0.6% among non-involved drivers (Borkenstein, *et al.*, 1974). Further analysis of that data have shown that all levels of BAC were associated with an increased risk of injury, relative to a BAC of zero, and that the slope of the risk increases markedly with increased BAC.

Voas (1993) shows that the risk of a driver being involved in collisions compared to drivers not involved is twice as high for drivers with a BAC at 0.5‰ and six times higher at 1‰.

Another study showed that the risk of being in a fatal accident doubled with each 0.2‰ increase in BAC (Zador, 1991). Two Australian studies have shown that the risk of injury was 3.5 times higher with driver BAC of between 0.5 and 0.99‰ compared to driver with less than 0.5 per mille and about 9.5 time higher with BAC of 1.0‰ or above (see English, 1995). Other studies have shown that during heavy daytime traffic, when there is a greater need for concentration, attention and awareness, low BAC of 0.1-0.4‰ can be associated with increased risk of collision (Waller, 1976; Borkenstein, *et al.*, 1974). Thus, there is clear evidence that the risk of motor vehicle crashes increases with alcohol consumption. To this should be added that:

- Young and elderly drivers have been found to be over-represented both in fatal and non-fatal accidents.
- Impaired driving is the single leading cause of death for young adults in most developed countries and impairment of alcohol is particularly strong among fatally injured drivers between the ages of 20 and 35 (WHO, 2000).
- In the EU-countries, and probably in many other countries as well, motor vehicle fatal accidents is the single largest fatal accident category: about one-half of all fatal accidents among men and women in Southern and Central Europe and one-third among men in Northern Europe and one-half among women (Skog, 2001).

Studies have shown that alcohol involvement is more common in fatal traffic accidents than non-fatal, in single vehicle accidents than non-single accidents, in night-time accidents than day-time accidents. Single vehicle fatal accidents are therefore seen as a good surrogate for alcohol-involved accidents. These data are available in some countries, e.g. Finland, Norway and Sweden and the UK. In a Swedish study, for instance, it was shown that more than half of all those killed in single vehicle accidents were under the influence of alcohol (Öström & Eriksson, 1993).

Alcohol related accidents in Europe – lack of comparable data

Data on the number of traffic accidents involving alcohol is available in most EU-countries, but due to major differences in measurement and reporting methodology, the data are not comparable. One example is police reports of alcohol-involved traffic accidents which are available in most EU-countries (see Table 7). An alcohol-related crash is in this case those in which one or more of the drivers have been drinking in the judgement of the reporting police. The judgement whether alcohol was involved in the road accident or not may vary from time to time and in different locations. Generally, this measure underreports the true number of alcohol-involved traffic accidents (WHO, 2000) and the degree of underreporting differs between different countries Thus, the large differences shown in the table do not reflect the true differences.

Table 7. Road traffic accidents involving one or more persons under the influence of alcohol (rate per 100,000 inhabitants 15 years or older) in EU countries 1992-1994

	1992	1993	1994	1995	1996	1997	1998	Mean 1992-1996/'97/'98
Austria	38.8	33.9	35.5	33.0	31.4	30.8	27.5	33.0
Belgium	40.8	40.9	37.8	42.1	41.1	42.2	44.0	41.3
Denmark	29.7	27.4	25.9	24.5	23.7	23.7	..	25.8
Finland	23.9	17.6	15.5	21.6	19.5	19.1	19.7	19.6
Germany	50.6	50.5	48.9	45.3	42.2	40.1	35.0	44.7
Greece	..	16.1	17.5	..	..	..	..	
Italy	1.8	2.2	3.1	4.3	4.8	4.2	4.3	3.5
Luxembourg	45.9	..	..	..	..	45.4	..	
Netherlands	16.2	15.9	18.3	15.9	16.4	15.8		16.4
Portugal	24.5	26.0	20.5	18.8	20.7	17.8		21.4
Spain	10.6	..	..	..	..	..	..	
Sweden	12.0	11.1	9.9	8.8	8.3	..	..	10.0
UK	21.8	12.0	12.3	12.7	18.4	..	..	15.4

.. = data not available

The problems are not less for fatal crashes involving alcohol. This becomes evident when looking at the alcohol-related crash rates published in a report from the EU Commission (Directorate General for Transport of the European Commission, 1995). The lowest proportion of alcohol-involved crashes was reported by Italy (1%) and the highest by France (40%). It is highly unlikely that all of these reported rates are accurate reflections of what the rates would be if measured using methods across the countries.

In a recent compilation Stewart (2001) found that the data available on rates of fatal crashes involving alcohol across Western countries could not be compared. This was due to differences between countries in:

- The definition of alcohol-involvement in crashes
- The definition of fatality
- The conditions under which alcohol testing occurs
- The percent of drivers in fatal crashes who are tested for alcohol
- The percent of pedestrians in fatal crashes who are tested for alcohol
- The availability and utilisation of autopsy results

Table 8 shows the results of this compilation of data of alcohol-involvement in fatal crashes for most EU-countries. The variation in the proportion alcohol involvement vary substantially but so do the data reporting, collection methodologies, definitions of alcohol involvement etc. The validity problems can be exemplified by the Swedish case. In Sweden, the official rate was 3.3% alcohol involvement in 1998 but it was based on police reports at the scene of fatal crashes. Autopsies carried out on all fatally-injured drivers found a rate of 18% alcohol involvement and even this is probably a too low figure (Laurell, 1999). This discrepancy illustrates some of the serious reporting and measurement problems that may distort alcohol-related fatality rates and make comparisons across countries difficult and possibly misleading (for more information, see also Ross, 1993; Voas, 1993). The DG VII Working Group on Alcohol, Drugs and Medicines of the European Union is currently carrying out a project to describe the measurement and data collection methodology and maintain a database for all of the EU member states.

Arrests for drunken driving or police reported drunken driving offences are sometimes used to study the trends of drunken driving within a country. However, such data are to a large extent the result of the responses by law enforcement and therefore usually not a valid indicator of the extent of drinking and driving within a country and certainly not for comparing differences across countries (see WHO, 2000).

Table 8. Alcohol involvement in fatal crashes in EU-countries (source: Stewart, 2000).

Country	Percent of alcohol involvement	% of drivers tested
Austria	BAC ≥0.5‰ 1998: 8.5% of the drivers and pedestrians.	Unknown
Belgium	any alcohol 1998: 8.9% of the drivers and pedestrians.	24.7% of drivers and pedestrians total
Denmark	BAC ≥0.5‰: 20.2% of the drivers	49% of drivers in fatal accidents; 75% of fatally injured drivers
Finland	BAC ≥0.5‰: 24% of fatally injured drivers	Compulsory
France	BAC ≥0.5‰ 1998: 19% of all drivers	About 90%
Germany	BAC ≥0.3‰ 1997: 17% of all drivers	Unknown
Netherlands	Any alcohol: 7.8% of all drivers	68.3% (mostly non-injured drivers, some injured drives, few dead drivers)
Norway	BAC ≥0.5‰: 8.8%- multi-vehicle, 32.9% single vehicle of the drivers and pedestrians	Less than 60%
Spain	Any alcohol: 41%, ≥0.8‰: 29% of the drivers and pedestrians	17.5%
Sweden	Any alcohol suspected by police: 3.3%, any alcohol based on autopsies on fatally injured drivers: 18%:	More than 90%. Official statistics based on police suspicion only
UK	BAC ≥0.8‰: 19% of cars and other motor vehicles excluding motorcyclists of the drivers.	68%

Association between per capita alcohol consumption (sales) and traffic accidents, non-fatal and data on society level

Several epidemiological studies have shown a positive association between overall alcohol consumption and traffic accidents (e.g. Wagenaar, 1985; Skog, 1984; Blose and Holder, 1987; Norström & Andersson, 1996).

As mentioned, as concerns fatal traffic accidents the alcohol effect is well documented. Still, however, the causal role of alcohol may vary between countries. Due to, for instance, variations in compliance with national BAC laws. Skog (2001) has studied the effect on country level between per capita alcohol consumption (sales figures) and fatal traffic accidents over time. The results showed that the role of alcohol was more important in relation to motor vehicle accidents in Southern, and especially Central Europe and the least important in Northern Europe: the alcohol effect on fatal traffic accidents were insignificant for men and marginal for women in Northern Europe, significant in Central Europe for both genders and in Southern Europe significant for men and marginally significant for women.

Why is the effect of increases and decreases in alcohol consumption stronger in Central and Southern Europe compared to Northern Europe? One likely explanation is that driving while intoxicated in Northern Europe is a more deviant type of behaviour due to extant social norms, and this behaviour may to a larger extent be concentrated to very deviant groups compared to Southern and Central Europe. Changes in (recorded) per capita consumption may not be as good indicator of changes in the behaviour of these deviant groups or the size of these groups in the northern countries in Europe (Skog, 2001).

Lastly, the time series data for fatal motor-traffic accidents showed that for most countries the accident rates peaked around 1970 and has decreased after that. This could imply that the alcohol-involvement in fatal accidents has decreased in most EU-countries since the mid 1970s but the decline could also be due to other change, e.g. improvement in other areas such as roads safety.

3.4. Pregnancy and drinking

The issue of alcohol and pregnancy has attracted a lot of attention during the past 15 years or so. It is now widely accepted that alcohol passes through the placenta barrier to the foetus, that the foetus metabolise alcohol slowly and that high alcohol intake may cause damages on the foetus. The adverse effects of heavy maternal drinking during pregnancy on offspring were first reported in France by (Lemoine, *et al*, 1968) and, independently, in Unites States in 1973 by Jones *et al.* The name foetal alcohol syndrome (FAS) was first assigned to these effects in 1973 (Jones & Smith, 1973). FAS is a cluster of abnormalities occurring in children born of women having histories of high alcohol consumption and has received a great deal of attention during the past 15 years. A diagnosis of FAS can only be made when there are signs of each of the following three sets of birth defects and a high maternal consumption.

1. Growth retardation (weight or length below the 10the percentile corrected for gestational age).

2. Characteristic facial deformity (elongated and flattened mid-face, small eye opening, thin upper-lip, an/or an underdeveloped groove between the upper lip and the nose).
3. Effects to the developing brain and spinal cord (central nervous system [CNS]): neurological abnormalities, developmental delay, intellectual impairment, head circumference below the 3rd centile, brain malformation.

It is somewhat odd that the cause of the defect, high maternal alcohol consumption, should be included in the criteria of the syndrome. However, even if a high maternal consumption is a necessary cause for FAS, it is not a sufficient cause since most pregnant women with high consumption do not give birth to children with FAS. FAS, however, identifies only a small proportion of all children affected by alcohol exposure before birth. Children exposed to high prenatal alcohol consumption may, for instance, lack the characteristic facial deformity and growth deficiency of FAS but still have alcohol-induced mental impairments just as serious as in children with FAS. This latter has been named alcohol-related neuro-developmental disorder (ARND). Moreover, children may also have other alcohol caused physical abnormalities other than the FAS facial feature, e.g. of the skeleton and certain organ systems (known as alcohol-related birth defects (ARBD)) (see US Department of Health and Human Services, 2000). Another term, FAE, has also been used to describe children known to be exposed to alcohol before birth who have some signs of FAS but who are not affected enough to be classified as having FAS, for instance lacking the FAS facial features but having other critical hallmarks of FAS.

Of the criteria for FAS, the least evident at birth and early years is the most devastating to FAS children and parents: the damage to the brain. It is a fact that prenatal alcohol exposure can cause specific, irreversible brain damage. This brain damage, and other behaviour changes, are seen in children with heavy prenatal alcohol exposure both with and without the facial deformities necessary for a FAS diagnosis (see US Department of Health and Human Services, 2000). There are also studies suggesting long-lasting effects causing growth retardation, e.g. lower weight, and shorter length, which remain during childhood (e.g. Day, 1991).

Since FAS and other alcohol-induced effects of the foetus and child, are theoretically 100% per cent preventable, it is important to assess the prevalence of this damage and to establish the risks associated with different drinking levels. However, both have shown to be very difficult to estimate. The most severe effect, the FAS syndrome, is relatively rare with prevalence estimates ranging from 0.5 to 3 per 1,000 live births in most populations but with much higher prevalence reported in some communities, especially in minority ethnic groups. As mentioned, the FAS-syndrome is not seen in all infants born to women who are heavy drinkers of alcohol. The differing susceptibility of the foetus is though to be multi-factorial reflecting the interplay of genetic factors, social deprivation, nutritional deficiencies, tobacco and drug use, along with alcohol consumption. Less marked alcohol-induced damages on the foetus than

FAS are by all certainly more common but the prevalence rates are unfortunately not known.

FAS occurs only in high consumption levels. Much less is known about the risks of foetal injury associated with moderate consumption levels. One of the largest study and with a design explicitly developed in order to measure risks associated with moderate alcohol consumption, the European multi-centre studies, EUROMAC, followed in total 8,448 pregnant women from eight regions in Europe. Less marked effects on the foetus, but more prevalent than FAS, includes low birth weight and short length, ARDB (e.g. cardiac, skeletal, renal, ocular and auditory anomalies) and neuro-developmental deficits. The EUROMAC found that children to mothers drinking more than 120 grams per week (approx. 2.2 cl 100% per day or 5.4 cl spirits per day) showed a lower birth weight compared to children to women who drank less. The results pointed at a possible threshold level for lower birth weight at 60 grams per week (1.1 cl 100% alcohol day). The main conclusion, however, was that consumption levels less than 120 gram per week could not be proven to have increased the risk of foetal damage (outcome measures besides birth weight was infants' gestational age, occipitofrontal circumference, crown-heel length, Aspar scores at one and five minutes) and that adverse effects on growth in infants is the most commonly detected effects of high consumption during pregnancy.

One review of the literature of the effects on prenatal alcohol exposure with special emphasis on research directed at moderate drinking during pregnancy concluded that there are some evidence of an effect of moderate alcohol use on reduced birth weight but that this effect is not large in magnitude (Single, *et al.*, 1999).

The evidence of effects of moderate maternal alcohol consumption on ARDM is very limited. As concerns neuro-developmental disorder, however, there is now some evidence that moderate levels of alcohol intake during pregnancy can produce neurological deficits in offspring. In a review within the EUROMAC project, Forrest *et al.* (1992) concluded the lowest levels of prenatal alcohol intake associated with altered child neuro-development have been detected at approximately 150 g of alcohol per week (about 2.5 cl 100% alcohol or 6.7 cl spirits per day).

A study by Jacobson *et al.* (1998) identified thresholds of effects for various neuro-behavioural outcomes ranging from 10 g of absolute alcohol per day to 36 grams with a median at 12 gram per day (1.5 cl 100% alcohol or approx. 3.7 cl spirits per day). Another study of child development up to 4½ years identified a threshold at between 24 to 54 gram absolute alcohol per day (3-4.5 cl 100% alcohol per day) (Larroque, *et al.*, 1995). In sum, there is considerable evidence that prenatal alcohol exposure may cause neurological disorder in offspring even at moderate levels of alcohol intake. As reported in the review by Single, *et al.* (1999), there exist now several studies which have attempted to identify inflection points in dose-response curves. When such have been identified they are typically around 1 drink per day. However, other studies have not identified any clear threshold level (see Single, *et al.*, 1999).

Moderate maternal alcohol consumption has also been discussed in relation to spontaneous abortions, foetal deaths, pre-term delivery and length of gestation but with still no final answer of the effects of moderate intake (in contrast to heavy intake).

Important to note is that several studies have stressed the need to study the effect of drinking pattern on the effects of the foetus. Occasional heavy drinking (often defined as 5 drinks or more during one drinking occasion) during pregnancy may be associated with heightened risks but more research is needed (see Single *et al.*, 1999; US Department of Health and Human Services, 2000).

It is today impossible to assess whether different kinds of alcohol induced birth defects have increased or not in the EU during the past decades. On the one hand it is likely that pregnant women are more conscious about risks today, but on the other hand consumption among young women has increased and studies have shown that the risks of alcohol-related damages of the foetus is highest during the first months of pregnancy which is during a period when the pregnancy may not yet have been recognised.

3.5. Alcohol-related work problems

Before proceeding it should be mentioned that a substantial weakness of these kind of studies is that the knowledge we have is almost entirely based on research from Anglo-Saxon and Nordic countries. This, by the way, also holds true in many other of the areas covered in this report.

Of all the social costs of alcohol, alcohol-related work problems are the most costly. In most established market economies, alcohol-related productivity losses are extremely high (see Rehm & Rossow, 2001). The adverse impact of alcohol use is not limited to supply of labour and labour productivity but also causes of human suffering in terms of accidents resulting in death or injury.

Rehm and Rossow (2001) distinguish between the following type of alcohol-related work problems (the first two types will be discussed more in detail below):

- workplace fatal or non-fatal accidents
- absenteeism, which encompasses illness, disciplinary suspension as well as tardiness and leaving work early
- inappropriate behaviour
- theft and other crimes
- poor co-worker relations and low company morale

Accidents

Risk of occupational accidents is higher among problem drinkers than among the others (Webb, *et al.*, 1994) and studies have shown that the risk increases with increasing level of drinking (Gutiérrez-Fisac, *et al.*, 1992).

There are several studies in different countries which have tried to assess the prevalence and proportions of alcohol-related occupational accidents to all occupational accidents.

In former West Germany, for instance, one study estimated that alcohol was involved in 7-10% of all industrial accidents. A Spanish study based on data from a national health survey carried out 1987 showed, firstly, that approximately 17% of all occupational accidents could be attributed to alcohol consumption and, secondly, that the large group of moderate consumers contributed to the majority of all alcohol-related accidents, even though the risk of accidents was the highest in the smaller group of heavy drinkers (Gutiérrez-Fisac, *et al.*, 1992).

A study on work-related fatal accidents in Australia occurring between 1982 and 1984 identified alcohol levels in 17% (177) of all fatalities (1044) where BAC was measured. Sixty-five per cent of the BAC-positive showed BAC-levels greater than 0.5‰ alcohol (11% of 1044) (Hollo, *et al.*, 1992).

In a review of published literature on alcohol-related occupational injuries, Stallones & Kraus (1993) conclude that the true magnitude of the problems of alcohol and work related injuries has not been accurately assessed and the epidemiological features of the problem have not been properly evaluated. The authors state that there is some evidence, albeit incomplete, that alcohol contributes to work related injuries. The extent is not known but the review showed that less than 4% of injuries in occupational settings may be alcohol-related.

The variations in estimated alcohol-related wok accidents presented in different studies probably reflects both differences in the method used but, also country differences in drinking at workplaces and attitudes towards drinking in relation to work.

Absenteeism and job career

There is ample of evidence that high consumers, alcohol dependants and problem drinkers have higher rates of sickness absence than other employees. In a study on a general population sample in Stockholm County with data on sick leave and disability pensions linked to a health survey it was shown that male high consumers in 1984 had an almost fourfold increase likelihood to have at least 60 sick days compared to low consumers during 1984. For women, the likelihood was twofold. The likelihood of disability pension was six times higher for men with high consumption compared to men with low consumption and for women four times higher (Upmark, *et al.*, 1999).

According to Rehm and Rossow (2001), the number of absent days attributable to alcohol consumption vary considerably by industry, time and region. A study in Norway have shown that 1.5-2% of the total amount of sickness absence was alcohol -related, 15-20% of all sickness absence of less than four days, and approximately 40% of all one day sickness absence (Grimsmo & Rossow, 1997).

For the UK, Marmot *et al* (1993) estimated the alcohol-related absenteeism to an annual cost of £779 million. However, this estimate is almost certainly an underestimation of true figure since the calculations were based mostly on heavy drinkers. According to many other studies moderate drinkers who occasionally drink heavily account for a significant portion of all absenteeism related to alcohol (see Rehm & Rossow, 2001).

A six-year follow up study (1980 to 1986) of a cohort of male and female white collar showed that men drinking over 21 units of alcohol a week in both 1980 and 1986 took twice as much absence than men drinking less than 21 units of alcohol. No consistent pattern for female high consumers (over 14 units of alcohol a week) was detected (Jenkins, *et al.*, 1992). The same study also showed that women who had been promoted to a senior position by 1986 drank much more than those who had not been promoted, whereas the reverse was true for men. A relation, although not statistically significant was also found between alcohol consumption in 1980 and turnover of labour: those subjects who subsequently left had higher intake of alcohol in 1980 than those who remained.

4. TRENDS IN ALCOHOL CONTROL POLICY

One part of the ECAS project concerned analyses of alcohol control policies in the EU-countries and Norway. In order to measure the strictness of *formal* alcohol control policies a scale was created mainly based on the existence of legislative and regulatory control measures (see also appendix). The taxation of alcoholic beverages was not included in the scale but was dealt with separately. The analyses of the trends in formal control showed that from the 1960s onwards a subtle but gradual shift towards a stricter alcohol policy have taken place in almost all the countries. In addition to Finland, Norway and Sweden also the UK could be regarded as having a high alcohol control as early as the 1970s, and the number of countries classified as having medium alcohol control grew from five countries in 1960 to six in 1980. A more distinct move towards a stricter and more extensive alcohol control policy could be detected between 1980 and 1990. In 1990 five countries were regarded as having a high alcohol control and eight countries as having an average alcohol control. Only two countries were classified as having low alcohol control, namely Portugal and Greece.

A contributing factor in the development towards a stricter and more extensive control policy is that the number of motor vehicles on the roads have grown to the extent that motor traffic has to be more closely regulated and road safety, such as drunk driving, have to be given more attention. The growing numbers of motor vehicles led to an introduction of legal BAC limits (blood alcohol concentration) in traffic in most of the countries in the 1970s and 1980s. In 1989, the European Commission proposed harmonising the maximum BAC to 0.5‰. In most EU countries today the BAC limit is set at 0.5‰. However, four countries have a limit at 0.8‰ (Ireland, Italy, Luxembourg, the UK) and one country have a limit at 0.2 per mille (Sweden). Also Norway have recently lowered its BAC to 0.2‰.

Age limits for sales of alcoholic beverages were also introduced and/or sharpened in several countries between 1980 and 1990. The number of television sets and television broadcasts grew substantially during this time, and restrictions on alcohol advertisements (mainly voluntary codes), as well as other restrictions, also began to emerge in several countries.

In the year 2000 none of the countries can be classified as having low alcohol control. Portugal and Greece have also joined the category of medium alcohol control. At the same time, however, the score has dropped substantially for the strictest alcohol policy countries in Europe, namely Norway, Sweden, and Finland. The reason can mainly be found in European integration: all three joined the European Economic Area (EEA) on 1 January 1994, Finland and Sweden becoming full EU members on 1 January 1995.

It should be noticed that comparing the scores in different countries or the average scores over time is problematic because changes in these numbers reflect two different trends. On the one hand there has been a decrease in the control of production and sales of alcoholic beverages or the regulation of alcohol availability. On the other hand alcohol control measures targeted at demand or alcohol-related problems (e.g. restrictions on advertising drunken driving legislation) have become more prevalent. The countries are to an increasing extent adopting similar measures or approaches for alcohol control and giving up control measures or strategies of another kind. Thus, the alcohol control measures have become more similar in the countries studied in the second half of the twentieth century.

A cross-county comparison of excise duties on alcohol showed a great variation (Table 9). The Mediterranean countries Italy, Spain, Portugal and Greece show very low excise duties in each beverage category, the Nordic countries Norway, Finland and Sweden very high alcohol excise taxes on each category. The UK, Ireland and Denmark also have reasonably high alcohol taxes. The Netherlands, Belgium, France, Austria and Germany fall in between these high and low alcohol excise tax countries. However, if these countries are wine producers they usually apply zero excise taxes to wine.

In every ECAS country alcohol excise taxes are higher for distilled spirits than for any other alcoholic beverages. In three countries (Ireland, the United Kingdom and Sweden) the lowest tax rate is for beer. In Belgium and the Netherlands the taxes are about the same for intermediate products, wine and beer. In most countries wine has the lowest rate of alcohol. In six ECAS countries the wine excise tax is set at zero.

Table 9. Excise duties on alcoholic beverages in the ECAS countries according to beverage categories in July 2000, Euros per litre alcohol

Country	Distilled spirits	Intermediate products	Wine	Beer
Austria	10.03	4.04	0.00	5.21
Belgium	16.61	5.51	4.28	4.28
Denmark	36.99	7.88	8.62	9.30
Finland	50.46	39.24	21.41	28.59
France	14.50	11.86	0.30	2.59
Germany	13.04	8.52	0.00	1.97
Greece	9.45	2.60	0.00	2.92
Ireland	27.62	22.01	24.82	19.87
Italy	6.45	2.75	0.00	3.50
Netherlands	15.04	4.71	4.43	4.26
Norway	85.36	44.26	44.26	44.26
Portugal	8.14	2.63	0.00	2.81
Spain	6.85	2.55	0.00	1.68
Sweden	57.35	28.70	28.28	16.81
United Kingdom	30.10	17.59	21.59	18.30

Sources: European Confederation of Spirits Producers (CEPS). Calculations are based on the following alcohol contents for wine and intermediate products: wine 11 per cent alcohol by volume, intermediate products 18 per cent alcohol by volume.

Econometric study: These analyses on the econometric data from early 1960 to mid 1990s show among other things the following (Leppänen, *et al.*, 2001):

- Economic conditions have a bearing on the changes in alcohol consumption. The real price on alcohol as well as real income affect the overall consumption (alcohol sales). The income elasticities were rather similar across all study countries, whereas the price elasticities were stronger in Northern Europe and weakest in Southern Europe, although still statistically significant in the three groups of countries: wine producing countries in Southern Europe, Monopoly countries in Northern Europe, and the beer drinking countries in central Europe, the UK and Ireland(except the Netherlands). Within these three groups of countries, the price parameters were equal.
- The real incomes have increased in the Mediterranean countries (as well as in the other study countries during this long time period) and the real prices has been rather stable for the past 20 years or even decreased somewhat in Southern Europe.
- Analyses of the effects of non-economic showed that country-specific non-price and income level parameters seem to account for the major part in explaining the differences in alcohol consumption between the countries

Taken together, all this would encourage an increase in alcohol consumption in all countries, including the Mediterranean countries. Since the consumption has actually gone down in Southern Europe, it means that the sum of the other factors influencing the consumption downwards are of a much stronger explanatory power than the real prices on alcohol and real incomes. This conclusion is supported by the econometric time-series analyses which thus showed that the non-economic factor accounted for the major part in explaining the differences in alcohol consumption between the countries (Leppänen, 2001).

4.1. Legal and illegal commerce

The ECAS-survey revealed large county differences in the quantities of privately imported alcohol. Since alcohol imports basically is motivated by economic reasons it was not surprise to find that the high-price countries – here Finland, Sweden and the UK - showed the highest quantities of privately imported alcohol (duty-free alcohol and/or alcohol bought in other shops abroad). The results imply that the private imports alone may contribute to an underestimation of the real alcohol consumption in these countries by about 1-1.5 litres pure alcohol. In Southern Europe (here France and Italy) the volumes are negligible.

A study of the consumption of alcohol during journeys abroad and of duty-free purchases in 1995 points at the same direction (see Trolldal, 2001). The study corrected each country's recorded consumption by considering the alcohol consumed during stays abroad and duty-free purchases. The effects of the corrections were that the recorded consumption in all the Mediterranean countries should be lowered due to a tourist surplus (foreign tourists spend more nights within the Mediterranean countries than tourists from those countries do abroad). The duty-free purchases in those countries were also low, especially in comparison to the high price countries, namely Denmark, Finland, Ireland, Norway Sweden and the UK. These showed considerably higher purchases of duty-free alcohol and most of them have a tourist deficit. The recorded consumption in these countries should therefore be adjusted upwards.

There are also several other studies from these high-priced countries on both legal and illegal import of alcoholic beverages (smuggling). In the UK, there has been an increase in the cross-channel shopping and smuggling since the opening of the single market in 1993 and was in 1997-98 estimated at a good 0.5 litres pure alcohol per year (see e.g. HM Customs and Excise, 1999; WSA, 1999; IAS, 1999). In Finland and Sweden, private import and small-scale as well as large-scale smuggling of alcoholic beverages have increased in the 1990s, especially with the opening of the borders following the EU membership in 1995 (Kühlhorn, *et al.*, 2000; Österberg, 2000).

The increased legal and illegal commerce in the high price countries have lead to strong external and internal pressures to reduce their taxes on alcoholic beverages. In Denmark, the unrecorded alcohol consumption has increased since the mid 1980s, to a large extent due to an increased cross-border trade between Germany and Denmark (see Leifman, 2001b).

It is obvious that some other EU countries also have unrecorded alcohol consumption. However, since the alcohol prices are much lower in many of the central and southern European countries the incentives to import alcohol are less. In addition, the transfer of alcohol that still occurs between these countries is most likely to be more multilateral than in the high priced countries.

5. SUMMARY AND CONCLUSIONS

The situation for alcohol in the European Union, as revealed by the previous pages, could be characterised as follows:

(1) Convergence: One important result from the ECAS-study is that of convergence. The ECAS countries appear to have converged somewhat in terms of per capita alcohol consumption, choice of beverages, alcohol-related mortality and number alcohol policy measures. The convergence process, however is slow and still far from completed in all these areas. When it comes to consumption levels and alcohol-related mortality the convergence may have slowed down in recent years. As mentioned by Room (2001), in a global perspective, the convergence in per capita consumption is at a level which is quite high – along with Eastern Europe, by far the highest level for any world region.

(2) A link prevails between alcohol consumption and alcohol-related mortality in all countries. The effects are generally stronger north of the Baltic Sea. However, since levels of per capita alcohol consumption remain higher in countries where alcohol appears to do less harm for each extra litre per capita, the differences between Northern and Southern Europe in aggregate damage done by alcohol in a population is much less.

(3) No beneficial effects on heart disease from increases in alcohol consumption on population level. In terms of policies for the population as a whole, then, there does not appear to be any counterbalancing loss which would neutralise part of the gains from holding down alcohol consumption levels.

(4) Studies on alcohol policy and econometric studies show that:
- an increasing number of policy measures are being adopted (in particular on specific issues like drunken driving), although at the same time, strictest control policies have been liberalised. The enforcement of policies varies greatly over countries,
- the demand for alcoholic beverages has been declining, mostly due to non-economic factors, since the mid-1980s, and in most countries, already since the 1960s,
- total expenditure (incomes and consumption patterns) affects the demand for alcoholic beverages equally across the countries, and the price effects are equal in the three groups of countries studied, with the exception of

Netherlands (Northern monopoly countries, wine-producing countries and the remaining Central European countries),

- the fact that the countries have a common estimate for the expenditure parameter suggests that alcoholic beverages are in all countries considered to be normal goods rather than luxuries,
- the price elasticities imply that the demand for alcoholic beverages is more easily controllable in the Nordic monopoly countries than elsewhere,
- economic factors (the prices of alcoholic beverages and the total expenditure – the purchasing power) explained an important but subsidiary part of the variation of alcohol consumption in the countries. Other factors, like culture, living conditions and policies put together, were, however, even more important. Slow changes in culture and living conditions may explain more the variation in alcohol consumption (and alcohol-related harm) than do the changes in economic factors and alcohol policies.

In terms of research and monitoring the ECAS work points to areas in which a continuing program of research and monitoring work is needed, on a pan-European basis:

- Improving measurement of alcohol consumption levels across Europe, to take into account unrecorded consumption.
- Improvement of the recording of alcohol-related illness and mortality. The ECAS-project is also pursuing some first steps in assessing comparability and differences in national recording practices for alcohol-related causes of illness and death. These efforts should be followed up.
- Develop cross-European data sets which allow for comparative analysis and monitoring of alcohol's role in disability and in illness. This may include such techniques as regular sampling of cases in emergency hospital wards, and in police custody, measuring potential alcohol involvement in each particular case.
- Periodic alcohol surveys in the general population carried out cross-nationally on a comparable basis would provide an invaluable resource for monitoring developments in drinking patterns and problems across Europe.

6. REFERENCES

Andréasson, S., Romelsjö, A. &b Allebeck, P. (1991) Alcohol, social factors and mortality among young men. *Addiction*, 86, 877-887.

Blose, J. & Holder, H. (1987) Liquor-by-the-Drink and Alcohol-Involved Traffic Accidents: A Natural Experiment Using Time Series Analysis. *Journal of Studies on Alcohol*, 48, 52-60.

Borkenstein, R.F., Crowter, R.F., shumate, R.P., Ziel, W.B. & Zylman, R. (1974) The role of drinking driver in traffic accidnets (the Grand Rapids study). *Blutalkohol*, 11, 1-132. Suppl.

BZgA (1998) *Die Drogenaffinität Jugendlicher in der Bundesrepublik Deutchland 1997*. Bundeszentrale für gesundheitliche Aufklärung (BZgA). Köln, Tyskland.

Chou, S.P. & Pickering, R.P. (1992) Early onset of drinking as a risk factor for lifetime alcohol-related problems. *British Journal of Addiction*, 87, 1199-1204.

Day, N.L., Robles, N., Geva, D., Taylor, P., Scher, M., Stoffrer, D., Cornelius, M. & Goldsmith, L. (1991) The effects of prenatal alcohol use on the growth of children at three years of age. *Alcoholism, Clinical and Experimental Researc*h, 15, 67-71.

Directorate General for Transport of the European Commission, Alcohol, Drugs, and Medicines and Driving (1995) High Level Working Party of Representatives of the governments of the Member States, WP 1, VII/392/1995

Directorate General for Transport of the European Commission, Alcohol, Drugs, and Medicines and Driving, Working Group on Alcohol, Drugs and Medicines (in press). *Report on Alcohol.*

Donelson, A. & Beirness, D. (1985) *Impaired drinking. Legislative issues related to drinking and driving*. Traffic Injury Research Foundation of Canada, Ottawa.

Donovan, J.E. & Jessor, R. (1985) Structure of problem behavior in adolescence and young adulthood. *J Consult Clin Psychol*, 53, 890-904.

Donovan, J.E., Jessor, R. & Costa, F.M. (1998) Structure of health-enhancing behavior in adolescence: A latent-varaible approach. *J Health Soc Behav.*, 34, 346-362.

Edwards, G., Anderson, P., Babor T. F., Casswell S., Ferrence, R., Giesbrecht, N., Godfrey, C., Holder H., Lemmens D. P., Mäkelä K., Midanik L., Norström T., Österberg E., Romelsjö A., Room R., Simpura J. & Skog O.-J. (1994) *Alcohol Policy and the Public Good* (Oxford, Oxford University Press).

English D.R., Holman, C.D., Milne, E., Winter, M.J., Hulse, G.K., Codde, G., Bower, C.I., Cortu, B., De Klerk, N., Lewin, G.F., Knuiman, M., Kurinczuk, J.J. & Ryan, G.A. (1995) The Quantification of drug Caused Morbidity and Mortality in Australia, 1992 (Canberra, Commonwealth Department of Human Services and Health).

EUROMAC (1992) A European Concerted Action: Maternal Alcohol Consumption and its Relation to the Outcome of Pregnancy and Child Development at 18 Months, *International Journal of Epidemiology, Supplement 1.*

Faculteit Geneeskunde Vakgroep Maatschappelijke Gezondheidkunde (2000). See: http://allserv.rug.ac.be/~cvereeck/hbsc/.

Forney, P.D., Forney, M.A. & Ripley, W.K. (1988) Profile of an adolescent problem drinker. *J. Fam. Prac.,* 27, 65-70.

Forrest, F., Florey, C. du V. & Taylor, D. (1992) Maternal Alcohol Consumption and Child Development. *International Journal of Epidemiology*, S17-S23.

Goddard, E. (1997) *Young teenagers and alcohol in 1996*, vol 1. (London: Office fo Nationa Ststaicits)

Grimsmo, A. & Rossow, I. (1997) *Alcohol og sykefravaer (Alcohol and Sickness Absence),* National Institute for Alcohol and Drug Research, Oslo (Report series).

Gutiérrez-Fisac, J.L., Regidor, E. & Ronda, E. (1992) Occupational Accidents and Alcohol Consumption in Spain. *Internatonal Journal of Epidemiology*, 21, 1114-1120.

Gutjahr, E. & Gmel, G. (2001) The social costs of alcohol consumption, in: Klingeman, H & Gmel, G. (Eds.). *Mapping the Social Consequences of Alcohol Consumption*, pp. 133-143, (Dordrecht, Kluwer Academic Publishers).

Hanhinen, S. (1995) Nordic, Italian and German drinking habits. A comparison between surveys made since the 1980s. *Nordic Alcohol Studies*, 12, 14-30. English Supplement.

HM Customs and Excise (1999) Report of the alcohol & tobacco fraud review http://www.hmce.gov.uk/bus/excise/atfrrep.htm#Contents

Hibell, B., Andersson, B., Ahlström, S., Balakireva, O., Bjarnasson, T., Kokkevi, A. & Morgan M. (2001) *The 1999 ESPAD Report* (Stockholm: CAN).

Hollo, C.D. *et al*. (1992) Role of alcohol in work-related fatal accidents in Australia 1982-1984. *Occupational Medicine*, 43, 253-264

Hupkens , C.L.H., KNIBBE, R.A. & DROP M.J. (1993) Alcohol consumption in European Community: uniformity and diversity in national drinking patterns, *Addiction*, 88, 1391-1404

Jacobson, J.L., Jacobson, S.W. , Sokol, R. and Ager, J. (1998) Relation of maternal age and pattern of pregnancy drinking to functionally significant congitive deficit in infancy. *Alcoholism, Clinical and Experimental Research*, 17, 174-183.

Jenkins, R., Harvey, S., Butler, T. & Thomas, R.L. (1992) A six year longitudinal study of the occupational consequences of drinking over ’safe limits’ of alcohol. *British Journal of Industry Medicine*, 49, 369-374.

Jessor, R. & Jessor, S.L. (1977) Problem behavior and psychosocial development: a longitudinal study of youth (New York: Acadmic Press.)

Jones, K.L.,Smith, D.W., Ulleland, C.N. & Streissguth, A.P. Pattern of mal´formation inoffspring of chronic alcoholic mothers. *Lancet*, 1, 1267-1271.(1973) .

Jones, K.L. & Smith, D.W. (1973) Recognition of the foetal alcohol syndrome in early infancy. *Lancet*, 2, 999-10011.

Kokkevi, A. & Stefanis, C. (1994) Ta Narkotika stin Ellada: I diachroniki poria tis Chrisis (Athens: University Mental Health Research Institute.).

Kraus, L. & Bauernfeind, R. (1998) Population Survey on the Consumption of Psychoactive Substances in The German Adult Population 1997. *Sucht, 44, Sonderheft 1*, 3-82.

Kühlhorn, E. Ramstedt, M., Hibell, B., Larsson, S. & Zetterberg, H. (2000): *Alkoholkonsumtionen i Sverige under 1990-talet* (*Alcohol consumption in Sweden in the 1990s*). Socialdepartementet, OAS-publikation.

Larroque, B. (1992) A European concerted action: Maternal alcohol consumption and its relation to the outcome of pregnancy and child development at 18 months. International Journal of Epidemiology, 21, S8-SD16. (Supplement 1)

Laurell, H. (1999) Impaired Driving What’s New in Other Countries, Paper presented at the 78th Annual Meeting of the Transportation Research Board, Washington DC, January 1999.

Leifman, H. (2001a) A comparative analyses of drinking habits in six EU countries year 2000, Submitted.

Leifman, H. (2001b) Estimations of unrecorded alcohol consumption and trends in 15 Europeans countries. *Nordic Studies on Alcohol and Drugs*, 18, 54-70. English Supplement 1.

Lemoine, P., Harrousseau, H. & Borteyru, J.P. (1968) Les enfants de parents alcooliques: anomalies observées. A propop de 127 cas (Children of alcoholic parents: Abnormalities observed in 127 cases). *Ouest Médical* 25, 476-482

Leppänen, K., Sullström, R. & Suoniemi, I. (2001) Effects of economic factors on alcohol consumption in 14 European countries. *Nordic Studies on Alcohol and Drugs*, 18, 100-116. English Supplement 1.

Marmot, M.G. *et al.*,(1993) Alcohol consumption and sickness absence from the Whitehall II study. *Addiction*, 88, 369-382.

Metso, L. & Simpura, J. (1997) De finländska dryckesvanorna under 90-talet (The Finnish drinking habits in the 1990s). *Nordisk Alkohol- & Narkotikatidskrift*, 14, 154-166.

Midanik, L. (1995) Alcohol consumption and social consequences, dependence, and positive benefits in general population surveys, in: Holder, H.D & Edwards, G. (Eds.). *Alcohol and Public Policy - Evidence and Issues*, pp. 62-81, (Oxford, Oxford University Press).

Mäkelä, P. , FONAGER, K., HIBELL, B., NORDLUND, S., SABROE, S. & SIMPURA, J. (1999) *Drinking Habits in the Nordic Countries*. SIFA rapport Nr. 2/99 (Oslo: SIFA [National Institute for Alcohol and Drug Research]). (1999)

Norström, T. (2001) 1999) European Comparative Alcohol Study – ECAS. Project presentation, *Nordic Studies on Alcohol and Drugs, English Supplement*, 16, 5-6.

Norström, T. & Andersson, J. (1996) Utvärdering av 1990 års reform av trafikgrottslagen. Stockholm: Brottsförebygganderådet.

Norström, T & Skog, O.-J. (2001) Alcohol and mortality: Methodological and analytical issues in aggregate analyses, *Addiction*, 96, S1-S17. *Supplement* 1.

NOU (1995) *Alkoholpolitikken i endring?* Norges Offentlige Utredninger (NOU) 1995:24.

Österberg, E (2000) Unrecorded alcohol consumption in Finland in the 1990s. *Contemporary Drug Problems*, 27, 271-299

Öström, M. & Eriksson, A. (1993) Single-Vehicle Crashes and Alcohol: A retrospective Study of Fatalities in Northern Sweden. Accid. Anal. & Prev., 25, 171-176

Pape, H. & Hammer, T. (1996) How does young people's alcohol consumption change during the transition to early adulthood? A longitudinal study of changes at aggregate and individual level. *Addiction,* 91, 1345-1357

Pedersen, W. and Skrondal, A. (1998) Alcohol debut: predictors and consequences. *Journal of Studies on Alcohol*, 59, 32-42.

Pedersen, W. (1998) *Fra pils to ecstacy: Debut og stadier i rusmiddelbruk.* Universitetet i Bergen/HEMIL-senteret, Bergen.

Prescott, C.A. & Kendler, K.S. (1999) Age at First Drink and Risk for Alcoholism: A Noncausal Association. *Alcoholism, Clinical and Experimental Research*, 23, 101-107.

Ramstedt, M. (2001) Alcohol consumption and the experience of adverse consequences - a comparison of six European countries. Paper presented at the 27th annual Alcohol Epidemiology Symposium, Kettil Bruun Society for Social and Epidemiological Research on Alcohol, Toronto, Canada. May 28-June 1, 2001.

Rehm, J. & Rossow, I. (2001) The impact of alcohol consumption on work and education, in: Klingeman, H & Gmel, G. (Eds.). *Mapping the Social Consequences of Alcohol Consumption*, pp. 67-77, (Dordrecht, Kluwer Academic Publishers).

Room, R (2001) A *hazardous commodity with culture-bound effects: policy implications of ECAS.* Prepared for presentation at a conference on the European Comparative Alcohol Study, 17 and 18 February, 2001, Stockholm.

Ross, H. (1993) Prevalence of alcohol-impaired driving: An international comparison. *Accident Analysis and Prevention*, Vol. 25, No. 6, pp. 777-779

Royal College of Physicians (2001) Alcohol – can the NHS afford it? Recommendations for a coherent alcohol strategy for hospitals.

Settertobulte, W (2001) Alcohol consumption among adolescents – results of the cross-national study: "Health Behaviour in School-Aged Children. Presented at the WHO-conference 'Young People and Alcohol" in Stockholm 19-21 February.

SFSP (1998) *Overview of national alcohol policies in the 15 countries of the European Union*. Société Francaise de santé Publique.

Single, E., Ashley, M.J., Bondy, S., Rankin, J., & Rehm, J. (1999) *Evidence Regarding the level of Alcohol Consumption Considered to be Low-Risk for Men and Women.* Prepared for the Australian Commonwealth Department of Health and Aged Care. Final-Report.

Simpura, J., Mustonen, H. & Paakkanen, P. (1993) Nya drycker – nya dryckesmönster? Modernisering av de finländska dryckesvanorna jämfört med trender i EG-länder. *Nordisk Alkoholtidskrift*, 10, 265-276.

Simpura, J & Karlsson, T (2001) Trends in drinking patterns among adult population in 15 Europenad countrues, 1950 to 2000: a review. *Nordic Studies on Alcohol and Drugs*, 18, 31-53. English Supplement 1.

Skog, O.-J. (1984) Økt totalforbruk-flere trafikulykker? (Higher Per Capita Consumption–More Traffic Accidents?). SIFA-Report No. 87/84, National Institute for Alcohol Research, Oslo.

Skog, O.-J. (2001) Alcohol consumption and mortality rates from traffic accidents, accidental falls, and other accidents in 14 European countries, *Addiction,* 96, *Supplement* 1.

Stallones, L. & Kraus, J. (1993) The occurrence and epidemiological features of alcoho-related occupational injuries, *Addiction*, 88, 945-951.

Statistical bulletin (1999) Statistics on alcohol: 1976 onwards. Statistical bulletin 1999/24. Department of Health

Stewart, K (2000) Alcohol involvement in fatal crashes. Comparisons among countries. Submitted to the National Highway Traffic Safety Administration

Tennant, F.S., Detels, R. & Clark, F. (1975) Some childhood antecedents of drug and alcohl abuse. *American Journal of Epidemiology*, 102, 377-385.

Trolldal, B. (2001) Sales of alcoholic beverages and the inhabitants' consumption in 15 European countries. A correction based on consumption during journeys abroad and tax-free purchases, *Nordic Studies on Alcohol and Drugs*, 18, 71-81. *English Supplement* 1.

Uhl, A. & Springer, A. (1996) *Studie über den Konsum von Alkohol und psychoaktiven Stoffen in Österreich unter Berücksichtigung problematischer Gebrauchsmuster.* Bundesministerium für Gesundheit und Konsumentenschutz 1/96.

Upmark, M, Möller, J & Romelsjö, A (1999) Longitudinal, population-based study of self reported alcohol habits, high levels of sickness absence, and disability pensions. *Journal of Epidemiology & Communivt Health*, 53, 223-229

US Department of Health and Human Services (2000) 10th Special Report to the U.S. Congress on Alcohol and Health. From the Secretary of Health and Humans Services. Washington D.C.: National Institute of Health, National Institute on Alcohol Abuse and Alcoholism.

Voas, R (1993) Issues in cross-national comparisons of crash data, *Addiction*, 88(7), pp. 959-967.

Wagenaar, A.C. (1985) Alcohol Consumption and the Incidence of Acute Alcohol-Involved Problems. *British Journal of Addiction*, 80, 173-180.

Waller, J.A. (1976) Alcohol and unintentional injury, in: Kissin, N. & Begleiter, H. (Eds.). *The biology of alcoholism. Social aspects of alcoholism, pp. 307-349 (New York, Plenum).*

Webb, et al., (1994) Relationships between high-risk and problem drinking and the occurence of work injuries and related absences. *Journal of Studies on Alcohol*, 55, 434-446.

White, H.R., Loeber, R., Stouthamer-Loeber, M. & Farrington, D.P. (1999) Developmental associations between substance use and violence. *Dev. Psychopathol,* 11, 785-803.

WHO (2000) *International Guide for Monitoring Alcohol Consumption and Related Harm*, World Health Organization: Department of Mental Health and Substance Dependence, Noncommunicable Diseases and Mental Health Cluster.

WSA (1999): Wine and Spirits Association. Website: www.wsa.org.uk

IAS, 1999): Institute of Alcohol Studies. *Alcohol as a Medical and Social Problem* (MEDSOC). http://www.ias.org.uk/factsheets/medsoc10.htm

Zador, P. (1991) Alcohol-related relative risk of fatal drivers injuries in relation to driver age and sex. *Journal of Studies on Alcohol*, 52, 302-310.

Appendix. The ECAS scale for measuring the strictness of alcohol control policies

<u>CONTROL OF PRODUCTION AND WHOLESALE (max. 3 points)</u>

1. State monopoly for the production or wholesale of Spirits (1 p.)
   Wine (1 p.)
   Beer (1 p.)
2. No production or wholesale monopolies but a licence is required for the production or wholesale of alcoholic beverages (1 p.)
   (no points if the score for question 1 is 3 points)

<u>CONTROL OF DISTRIBUTION (max. 7 points)</u>

3. State monopoly for off- or on-premise retail sales of Spirits (1 p.)
   Wine (1 p.)
   Beer (1 p.)

4. No monopoly for off- or on-premise retail sales of alcoholic beverages but an ***alcohol specific licence*** is needed for off- or on-premise retail sales of alcoholic beverages (1 p.)
   (no points if the score for question 3 is 3 points)

5. Special restrictions on sales days and hours in off-premise retail sales of alcoholic beverages (1 p.)
   (the sale of alcoholic beverages is differently regulated than the sales of other commodities)

6. Other special restrictions on off-premise sales of alcoholic beverages (1 p.)
   (alcoholic beverages cannot be sold for instance in kiosks, gasoline stations, near churches or kindergartens etc. or there is an upper limit on the amount of stores able to sell alcoholic beverages)

7. Special restrictions on sales days and hours in on-premise retail sales of alcoholic beverages (1 p.)
   (alcohol sales has to be stopped earlier than other sales; special restrictions concerning alcohol sales on-premise)

8. Other special restrictions on on-premise sales of alcoholic beverages (1 p.)
   (special kinds of premises are not allowed to serve alcoholic beverages - canteens at the work, in hospitals etc.; alcohol cannot be sold in certain places - for instance near churches, kindergartens; there is an upper limit on the amount of restaurants able to sell alcoholic beverages)

<u>PERSONAL CONTROL (max. 3 points)</u>

9. Legal age limit for off-premise sales at least 20 for some alcoholic beverages (1½ p.)
   18 for some alcoholic beverages (1 p.)
   16 for some alcoholic beverages (½ p.)

10. Legal age limit for on-premise sales at least 20 for some alcoholic beverages (1½ p.)
    18 for some alcoholic beverages (1 p.)
    16 for some alcoholic beverages (½ p.)

<u>CONTROL OF MARKETING (max. 2 points)</u>

11. Restrictions on alcohol advertising: Statutory control (2 p.)
    Voluntary code (1 p.)

<u>SOCIAL AND ENVIRONMENTAL CONTROLS (max. 3 p.)</u>

12. Drunk driving: BAC 0.05% or less (3 p.)
    BAC 0.08% or less (2 p.)
    BAC more than 0.08 % (1 p.)

<u>PUBLIC POLICY (max. 2 points)</u>

13. National alcohol prevention programme or agency (1 p.)

14. National alcohol education programme or agency (1 p.)

This report was produced by a contractor for Health & Consumer Protection Directorate General and represents the views of the contractor or author. These views have not been adopted or in any way approved by the Commission and do not necessarily represent the view of the Commission or the Directorate General for Health and Consumer Protection. The European Commission does not guarantee the accuracy of the data included in this study, nor does it accept responsibility for any use made thereof.