UNIKLINIK KÖLN
Institut für Gesundheitsökonomie und Klinische Epidemiologie

Children Affected by Parental Alcohol Problems (ChAPAPs)

Key Figures on Health Conditions and Policy Regarding Child Health and Alcohol Consumption

Anna Marie Passon, Anna Drabik, Markus Lüngen

2009

Introduction

The key figures on health conditions and policy regarding child health and alcohol consumption provide a harmonized and coherent monitoring of the health and social conditions of children and adolescents for the European Union member countries plus Norway. This survey is part of the European Commission funded Project "*Reducing Harm and Building Capacities for Children Affected by Parental Alcohol Problems*".

Children affected by parental alcohol problems (ChAPAPs) are exposed to various negative health outcomes. A manifest consequence of parental alcohol misuse is the fetal alcohol spectrum disorder (FASD). FASD is a result of maternal alcohol misuse during pregnancy and is associated with growth deficiency, facial deformation and central nervous system damage. Beyond the physical damages, which are accompanied by FAS, many mental problems have been observed. ChAPAPs tend to have a significantly heightened chance for internalizing behavior, depression symptoms and socially deviant behavior (Bygholm Christensen et al, 2000).

Work Package 7

A close examination of children's health conditions regarding parental alcohol consumption in the European Union member countries requires a framework of the overall living and health conditions. To this end, the Institute of Health Economics and Clinical Epidemiology Cologne was commissioned to provide a catalogue of key figures to develop a uniform and coherent monitoring of children's and youths' health and social situation in the member-countries.

In order to compare living conditions, we first consider general population, wealth and health system measures. We then present parameters regarding the health status and the social framework for children and adolescents. In conclusion, we concentrate on alcohol policy in the European Union member countries. An effective alcohol policy inures to the benefit of children by preventing alcohol dependencies in the family context. We finally test, if and in which amount the social and health conditions of children and adolescents have an influence on drinking behavior of 15-year-olds.

Table of Contents

Index of Tables

Index of Figures

General population, wealth and health system measures

Index of Abbreviation

BAC	Blood Alcohol Concentration
BMI	Body Mass Index
CNS	Central Nervous system
DALE	Disability Adjusted Life Expactancy
DALY	Disability Adjusted Life Years
DMP	Disease Management Programs
DRG	Diagnoses Related Groups
DSM	Diagnostic and Statistical Manual of Mental Disorders
FAS	Fetal Alcohol Syndrom
FASD	Fetal Alcohol Spectrum Disorder
GDP	Gross Domestic Product
GP	General Practitioner
HBSC	Health Behavior in School-aged Children
HFA-DB	Health For All Database
HIF	Health Insurance Funds
ICD	International Classification of Diseases
IMR	Infant Mortality Rate
NHF	National Health Fund
NHI	National Health Insurance
NHIFA	National Health Insurance Fund Administration
NHS	National Health Service
OOP	Out of pocket payments
PPP	Purchasing Power Standards
PPS	Purchasing Power Parities
RTI	Road Traffic Injuries
SDR	Standardized Death Rates
UNECE	United Nations Economic Commission for Europe

Country Abbreviations

AT	Austria	IT	Italy
BE	Belgium	LT	Lithuania
BG	Bulgaria	LU	Luxembourg
CY	Cyprus	LV	Latvia
CZ	Czech Republic	MT	Malta
DE	Germany	NL	The Netherlands
DK	Danmark	NO	Norway
EE	Estonia	PL	Poland
ES	Spain	PT	Portugal
FI	Finland	RO	Romania
FR	France	SE	Sweden
GR	Greece	SI	Slovenia
HU	Hungary	SK	Slovakia
IE	Ireland	UK	United Kingdom

1 General population, wealth and health system measures

1.1 Demographic and Economic Context

1.1.1 Total population and population structure

The growth and composition of a country's population can have significant impact on its health care spending and on the structure of the health care system. In EU 27, the population growth rate reached a level of 1.79% between the years 2004 and 2008 (Eurostat 2008a). The population growth varies in EU member countries. Especially in the new east European member states, population growth is negative due to natural decrease (live birth minus deaths) whereas most of the former EU 15 countries could raise their population by immigration. The natural growth rate of population declined from 3.07 million in 1960 to 0.45 million in EU 25 in 2004. The net migration (immigration minus emigration) is subject to distinct annual fluctuations but the trend shows a clear increase. The average net migration rose from 1.15 million in the years from 1960 to 1964 to 7.62 million in the years from 2000 to 2004. Table 1.1-1 shows the total population of the participating countries between 2004 and 2008; Figure 1-1 displays the population growths between 2004 and 2008.

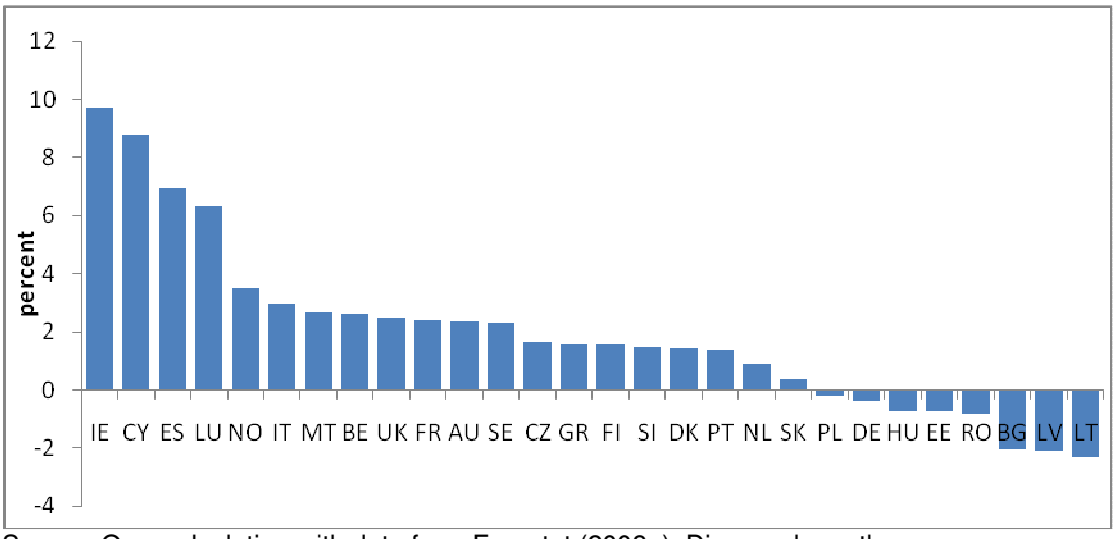
Table 1.1-1: Total population 2004 to 2008 in million

Country code	2004	2005	2006	2007	2008	growth rate
BE	10.396	10.446	10.511	10.585	10.667	2.60%
BG	7.801	7.761	7.719	7.679	7.640	-2.06%
CZ	10.211	10.221	10.251	10.287	10.381	1.66%
DK	5.398	5.411	5.427	5.444	5.476	1.45%
DE	82.532	82.501	82.438	82.315	82.222	-0.38%
EE	1.351	1.348	1.345	1.342	1.341	-0.75%
IE	4.028	4.109	4.209	4.313	4.420	9.74%
GR	11.041	11.083	11.125	11.172	11.215	1.58%
ES	42.345	43.038	43.758	44.475	45.283	6.94%
FR	62.252	62.638	62.999	63.392	63.753	2.41%
IT	57.888	58.462	58.752	59.131	59.618	2.99%
CY	0.730	0.749	0.766	0.779	0.795	8.79%
LV	2.319	2.306	2.295	2.281	2.271	-2.08%
LT	3.446	3.425	3.403	3.385	3.366	-2.31%
LU	0.455	0.461	0.469	0.476	0.484	6.34%
HU	10.117	10.098	10.077	10.066	10.045	-0.71%
MT	0.400	0.403	0.405	0.408	0.411	2.68%
NL	16.258	16.306	16.334	16.358	16.404	0.90%
AU	8.140	8.207	8.266	8.299	8.332	2.36%
PL	38.191	38.174	38.157	38.125	38.116	-0.20%
PT	10.475	10.529	10.570	10.599	10.618	1.36%
RO	21.711	21.659	21.610	21.565	21.529	-0.84%
SI	1.996	1.998	2.003	2.010	2.026	1.47%

SK	5.380	5.385	5.389	5.394	5.401	0.39%
FI	5.220	5.237	5.256	5.277	5.300	1.55%
SE	8.976	9.011	9.048	9.113	9.183	2.31%
UK	59.700	60.060	60.393	60.817	61.186	2.49%
NO	4.577	4.606	4.640	4.681	4.737	3.49%

Source: Eurostat (2008a). Own calculation.
Data for 2008: Provisional value, Eurostat estimate.

Figure 1-1: Population growth rate from 2004 to 2008



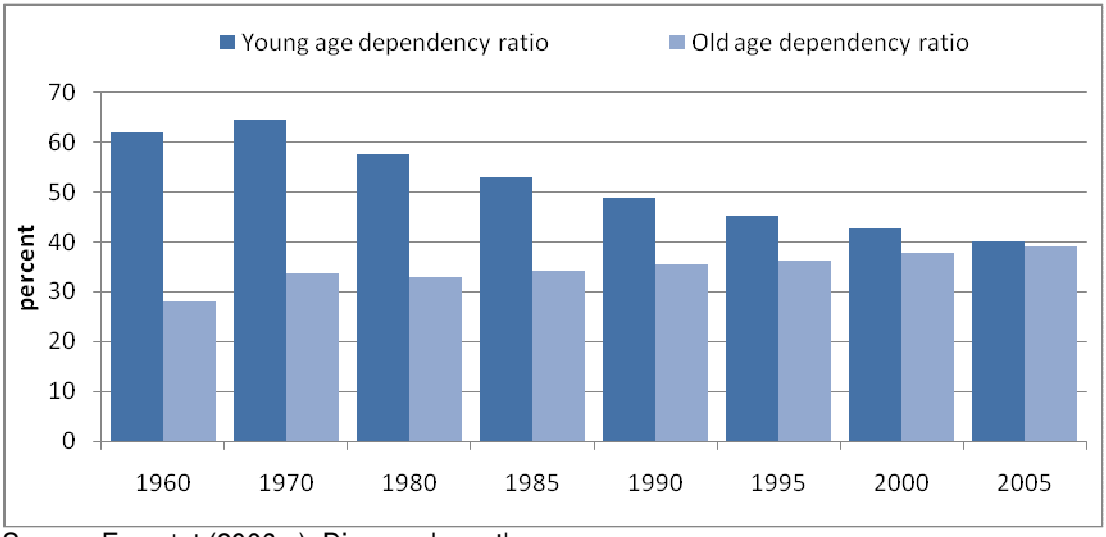
Source: Own calculation with data from Eurostat (2008a). Diagram by author.
Data for 2008: Provisional value, Eurostat estimate.

Considering the EU 27 plus Norway, the highest growth of population can be found in Ireland, Cyprus, Luxemburg and Norway due to a high natural increase and high net migration, and in Spain and Italy primarily as a result of high net migration. Highest population growth in EU 27 can be observed in Ireland with nearly 10% between 2004 and 2008. Poland, Germany, Hungary, Estonia, Romania, Belgium, Latvia and Lithuania show a decline in population. Particularly Lithuania shows a considerable negative population growth due to both, a broad negative net migration and a negative rate of natural increase. The analysis and projection of migration movement and natural reproduction are important since both variables are influencing the composition of the population. In an elderly population, less young people have to compensate the health care costs for the older generations. Beyond this, older people cause a higher amount of health care costs due to higher morbidity and multimorbidity.

The European population faces a dual ageing process. First, Europe's net birth rate declines for decades, second, longevity is increasing. Thereby, the shape of the age pyramid becomes narrower at the bottom and broader at the top. As can be seen in Figure 1-2, the young age dependency ratio (population aged 0 to 19 as a percent-

age of population aged 20 to 59) declined in the last decades, whereas the old age dependency ratio (population aged 60+ as a percentage of population aged 20 to 59) rose steadily.

Figure 1-2: Young and old age dependency ratio in EU 25



Source: Eurostat (2006 a). Diagram by author.

In the coming years it is expected that the total population will decline. According to Eurostat calculation, the population of the participating countries will decrease from 349 million in 2005 to 332.5 million in 2050, a drop of 16.5 million or respectively 4.73% (this calculation doesn't include Cyprus due to missing data) (Eurostat 2005 a). In addition, the share of people aged 0-19 is expected to decrease further due to ongoing decline in the number of young people.

1.1.2 Gross domestic product and income inequalities

The gross domestic product (GDP) measures the size of an economy by adding up the total market value of all final goods and services within a country in a given period. In order to reach comparability of GDP levels of different countries, GDP per capita can be used. The GDP per capita removes the influence of the absolute size of population. A common measure to compare wealth and competitiveness of countries is the purchasing power standard (PPS). For PPS, the national currencies are converted into a common currency using purchasing power parities (PPP). PPP enables to compare key data of currencies not via exchange rate, but via the purchasing power. The purchasing power is computed by means of a representative market basket. GDP per capita in purchasing power standards can therefore be used to compare economies of different sizes and eliminates differences in price levels.

Another helpful indicator is the growth rate of real GDP. This measure allows the comparison of the change of GDP from one year to the next removing the effect of inflation and, therefore, shows the real change in economy over time and the economic development between economies of different sizes. Table 1.1-2 gives an overview about the absolute GDP levels; GDP per capita; and growth rate of real GDP per capita of the ChAPAPs participants and all other EU 27 countries sorted by GDP per capita in PPS in 2006 from highest to lowest.

Table 1.1-2: GDP

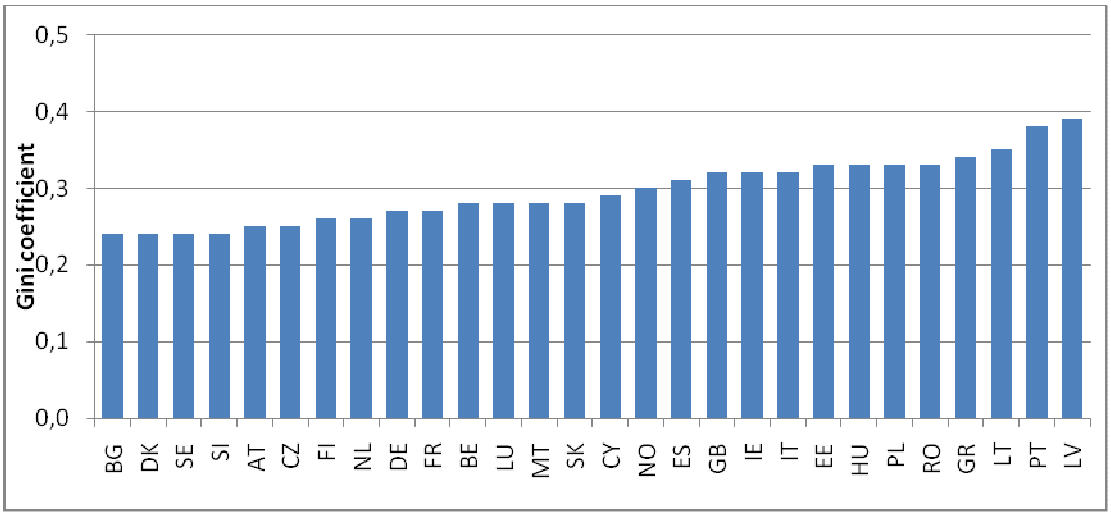
Contry code	GDP at current prices (EUR 1000 million)		GDP per capita (PPS)		Growth rate of real GDP per capita
	2001	2006	2001	2006	2006
LV	9.3	16.0	7,700	13,300	12.5%
EE	6.9	13.1	9,100	15,900	11.6%
SK	23.5	44.6	10,100	14,900	9.8%
LT	13.6	23.7	8,400	13,700	7.4%
PL	212.3	271.5	9,600	12,600	7.1%
BG	15.2	25.2	5,900	8,800	6.3%
RO	44.9	97.7	5,500	8,900	6.3%
CZ	69.0	113.1	13,700	13,700	5.7%
LU	22.6	33.9	44,700	66,100	5.2%
FI	139.9	167.9	24,100	27,800	4.8%
SI	22.0	29.7	15,400	20,600	4.4%
GR	146.3	214.0	17,100	22,900	4.2%
HU	59.5	89.9	11,900	15,500	3.9%
IE	117.0	174.8	26,800	34,100	3.6%
SE	251.3	313.3	2,400	28,600	3.6%
DE	2,113.2	2,309.1	22,900	26,800	3.0%
AT	215.9	257.9	25,400	30,600	2.9%
DK	179.2	219.5	26,000	30,000	2.9%
NL	447.7	534.3	26,500	31,000	2.8%
EU-27	9,524.9	11,536.2	20,800	23,700	2.8%
BE	258.9	314.1	24,400	29,000	2.4%
MT	4.3	5.1	15,400	18,200	2.3%
UK	1,613.4	1,906.4	23,700	28,200	2.1%
NO	191.0	266.9	32,600	44,300	2.1%
ES	680.7	976.2	19,400	24,200	2.0%
IT	1,248.6	1,475.4	23,300	24,600	1.8%
CY	10.8	14.5	17,600	22,100	1.5%
FR	1,497.2	1,807.5	23,700	26,800	1.3%
PT	129.3	155.2	16,600	17,700	1.0%

Source: Eurostat (2007a). Table by author.

Higher GDP per capita is generally associated with better health status. However, there is evidence that, in terms of a nation's wealth, not only GDP per capita predicts the population's health status but also the distribution of income across the

population (Wilkinson 2000). Comparable countries with nearly equal GDP per capita can for instance have big differences in life expectancy at birth. A common measure for income inequality is the Gini-coefficient. A Gini-coefficient of zero gives evidence for perfect income equality; a parameter value of one denotes perfect inequality.

Figure 1-3: Gini-coefficient - income inequality 2006



Source: Eurostat (2008c).

As can be seen in Figure 1-3, the average value of the Gini-coefficient in the EU member countries plus Norway was close to 0.3 in 2006, which is relatively low. Picket and Wilkinson (2007) found out, that child wellbeing in rich societies is negatively correlated with income inequality and with the percentage of children in relative poverty but not with average income. A study about income inequality and health in china provided evidence that income inequality increases the probability of alcohol consumption (Li, Zhu 2006). According to a multilevel analysis of drinking and drunkenness in adolescents in 34 countries, income inequality may have a contextual influence on the use of alcohol among younger adolescents (Elgar, Roberts 2005). These findings indicate that income inequality can have two negative effects concerning to the harm that can be caused by alcohol for children and adolescents; a direct effect via earlier and more alcohol consumption in adolescents and an indirect effect via higher probability of parental alcohol abuse.

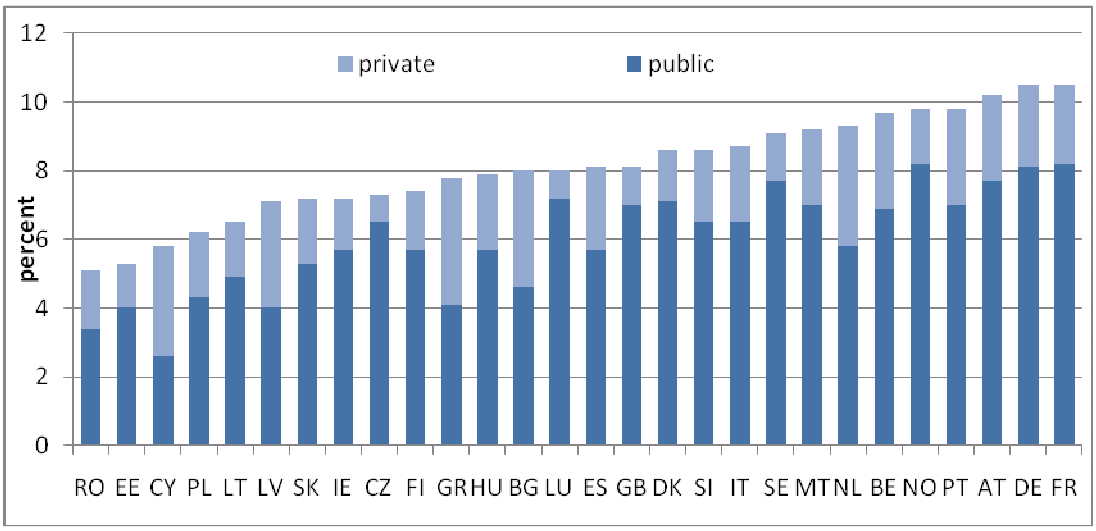
1.2 Health Expenditure and Financing

1.2.1 Health expenditure in relation to GDP

Health expenditure comprises expenditure for prevention, diagnosis, therapy and rehabilitation. The total health expenditure as a percentage of GDP ranges from

3.6% in Romania to 11% in France in 2004. Figure 1-4 shows the public and private sector expenditure on health as percent of GDP.

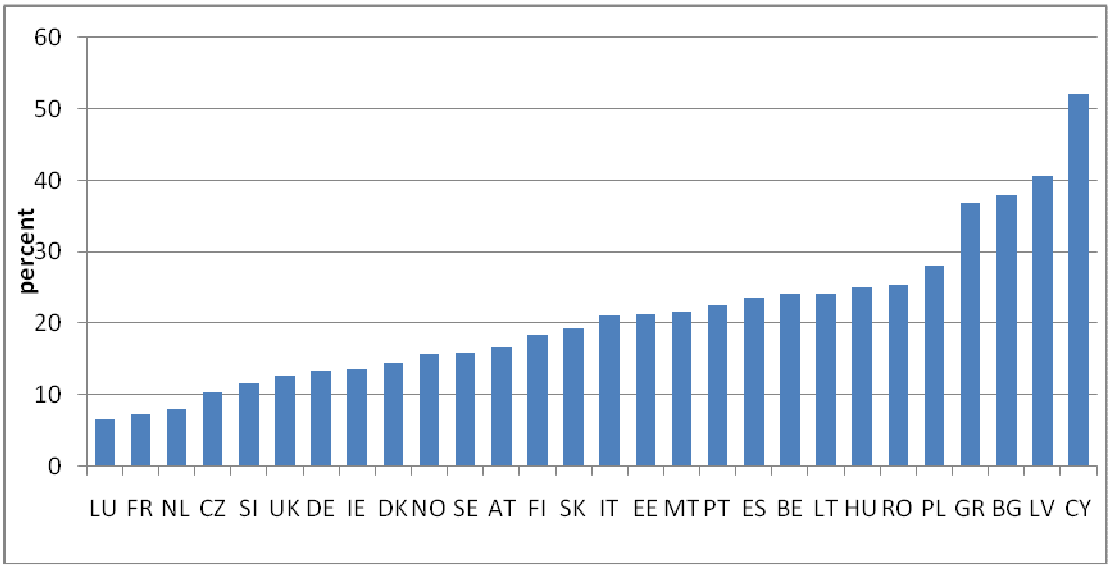
Figure 1-4: Public and private sector expenditure on health as % of GDP



Source: WHO (HFA-DB).

Public expenditure includes taxes as well as contributions to the public health care insurance. Private expenditure includes premiums for private health insurance and out of pocket payments (OOP). OOP reached 26% on average in the EU 27 countries in 2004 (HFA-DB). For 2004, private household's OOP are notably high in Cyprus with 52% of total health expenditure. Secondary highest OOP can be found in Latvia with 40.6%. Luxemburg and France have the lowest OOP with 6.6% and 7.2%. OOP can take three broad forms: direct payments occur when no insurance coverage or pre-payment exist and payments for goods and services are transacted directly; cost sharing requires insurants to pay a part of the costs of care received, for instance additional contribution for pharmaceuticals or dental care; informal payments are unofficial payments for goods and services. OOP is often claimed as a reason for so-called catastrophic health payments, because private households, especially poor households, have to pay more for sudden expensive diseases than they can bear from their incomes (WHO 2005). Financial catastrophes occur in countries with all income levels but are more severe in low or middle-income settings than in high-income settings (Xu, Evans 2007). Xu and Evans (2003) observed a lower number of households with catastrophic health expenditures in countries where out of pocket payment is low. The percentage of households with catastrophic payments ranges from 0% in Czech Republic, Germany, France, Luxemburg, Slovakia and UK to 0.03% in Portugal.

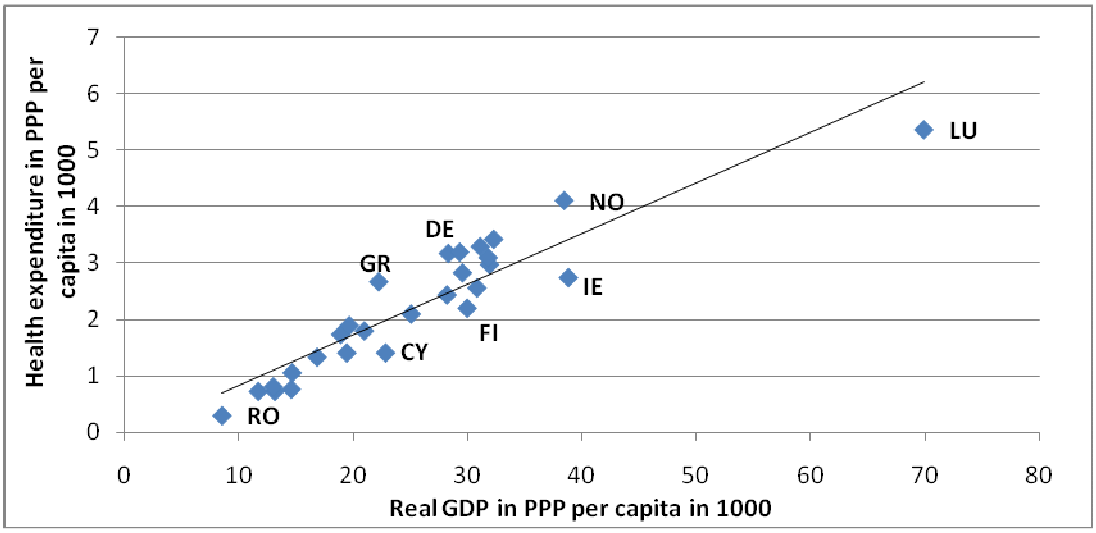
Figure 1-5: Out of pocket payments as a share of total health expenditure, 2004



Source: HFA-DB.

The total health expenditure in PPPs per capita ranged from 305.3 and 734 US$ in Romania and Lithuania to 4,103 US$ and 5,352 US$ in Norway and Luxemburg in 2004 (HFA-DB). Generally, there is a strong linear positive relationship between per capita health care spending and GDP per capita. This relationship can also be found in the EU 27+1 countries, as can be seen in Figure 1-6. Figure 1-6 shows that a raise in GDP per capita in PPP results in an increase of health care spending per capita in PPP. In some countries, as Finland, Cyprus, Ireland and Luxembourg, one could expect a slightly higher amount of health care spending per capita, whereas in Germany, Greece and Norway the health care spending per capita is slightly higher as would be predicted by GDP per capita. The amount of health care spending depends, besides efficiency, on the epidemiological profile of the country and on the value and costs of other social resources (Savedoff 2007).

Figure 1-6: GDP per capita in PPP and health care spending per capita in PPP in 2004

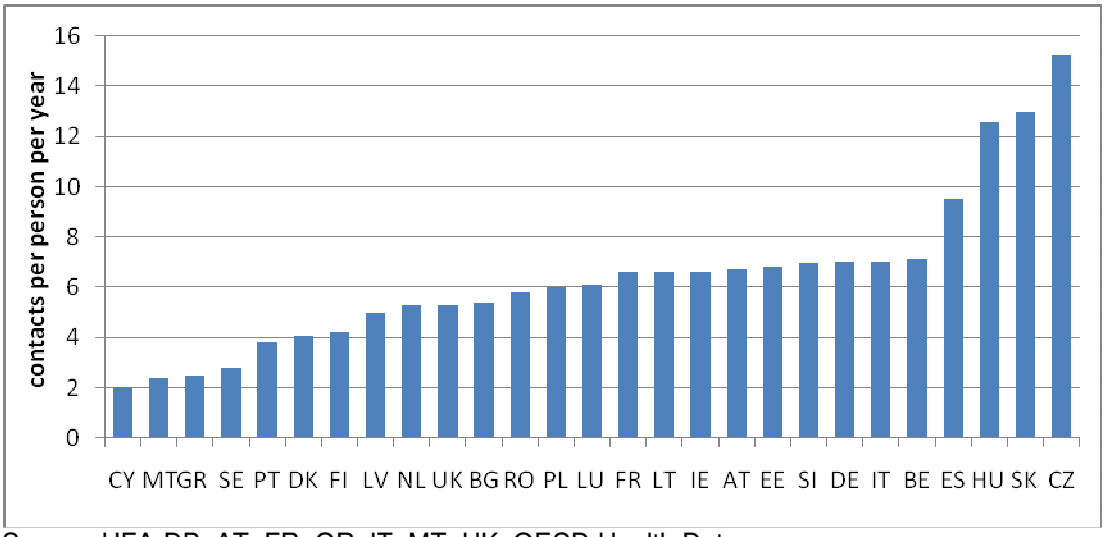


Source: WHO (HFA-DB).
R^2= 0.853.

1.3 Health Care Resources and Utilization

1.3.1 Outpatient contacts

Figure 1-7: Outpatient contacts per person per year, 2004



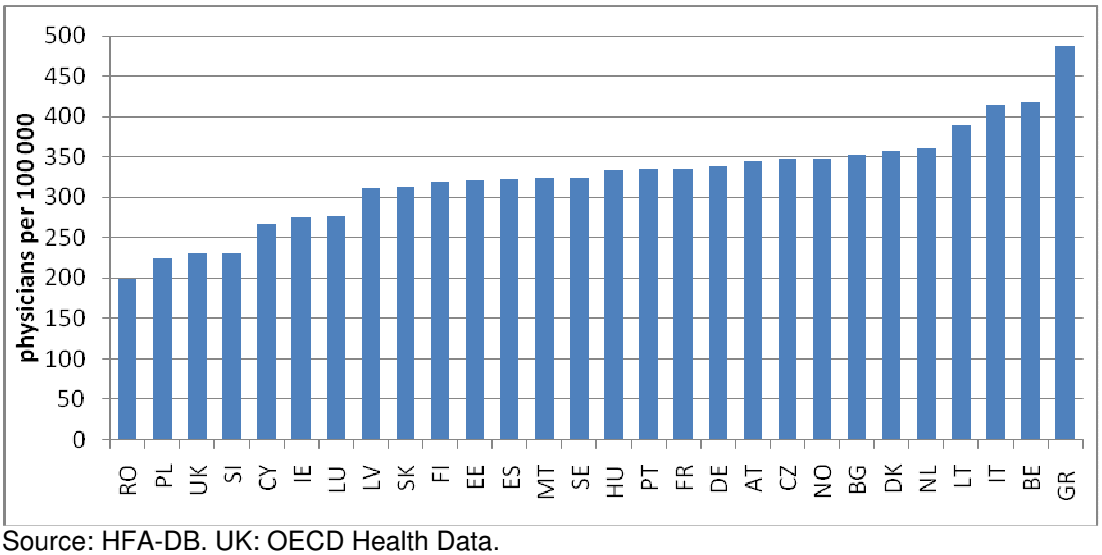
Source: HFA-DB. AT, FR, GR, IT, MT, UK: OECD Health Data.
IT: 2005; SE: 2003, GR: 1998, BG: 1999. No Data available for Norway.

Outpatient contacts differ strongly in the EU 27(+1) countries. Figure 1-7 shows that the fewest outpatient contacts can be observed in Cyprus with 2 contacts per person per year on average in 2004 (HFA-DB)[1]. Malta and Greece have second and third fewest outpatient contacts with 2.4 and 2.5 per person per year. Czech Republic, Slovakia and Hungary, on the other side, are ranked first, second and third with

[1] No information about outpatient contacts is available for Norway.

15.2, 13 and 12.6 outpatient contacts per person per year in 2004. Several explanations can be adduced for the differences in the demand for physician services. One obvious explanation could be a positive correlation between outpatient contacts and practicing physicians per 100,000 inhabitants. In a bivariate analysis of physicians per 100,000 inhabitants and outpatient contacts per person per year in 2004 no significant correlation could be found[2]. As can be seen in Figure 1-8, most physicians per 100,000 inhabitants can be found in Greece, Belgium and Italy (488, 418, 414). Romania, Poland, and UK have fewest practicing physician with 198, 224 and 230 per 100,000 inhabitants.

Figure 1-8: Physicians per 100,000 inhabitants in 2004



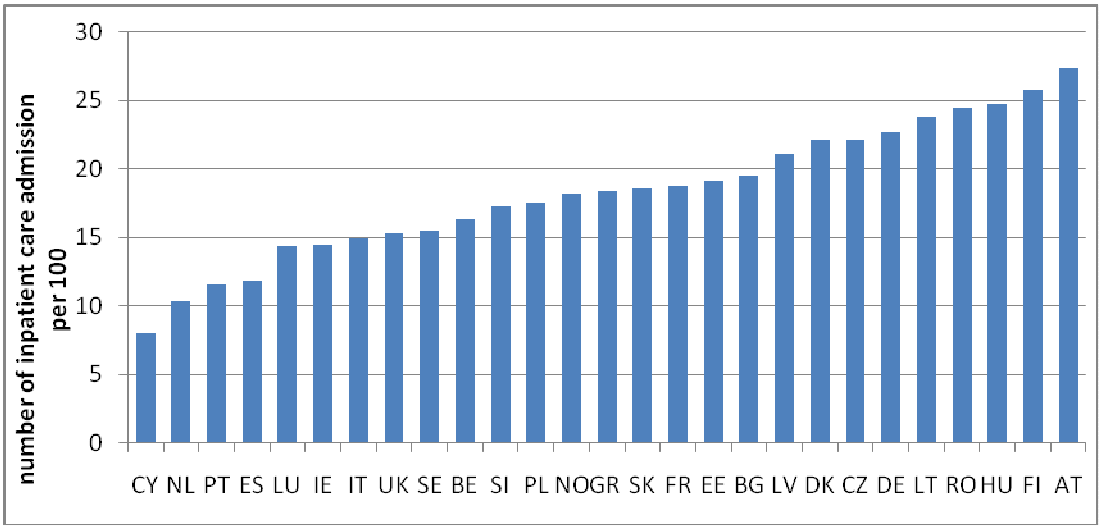
Source: HFA-DB. UK: OECD Health Data.

A Spanish study found out that an important fraction of the variability in the demand of health services in 12 European countries in the years between 1994 and 1996 can be explained by differences in age, income and the role of general practitioners as a gatekeeper in the public health system (Jiménez-Martín, 2003). No Europe-wide Information is available about children's and adolescent's demand for consultations.

1.3.2 Inpatient care

[2] Correlation (Pearson): 0.203, significance one-sided: 0.253.

Figure 1-9: Number of inpatient care admission per 100 inhabitants in 2004



Source: HFA-DB.
UK: 1998. No data available for Malta.

Figure 1-9 shows the number of inpatient care admission per 100 inhabitants in the year 2004. Inpatient care admission ranged from 8.1 per 100 inhabitants in Cyprus to 27.4 in Austria (HFA-DB).

In 2004, most hospital beds per 100 000 inhabitants could be found in Germany with 858 and in Czech Republic with 847. Fewest hospital beds per 100,000 were available in Spain (342) and in Portugal (375). The bed occupancy rate in 2004 was low for Netherlands and Greece with 58% and 67% and high in Norway and Ireland with 87% and 85%. Bed occupancy rates of 85% and more are claimed to be a risk factor for periodic bed crises and failure to admit acutely ill patients (Bagust, 1999). The number of acute care hospital beds and the average length of stay in European hospitals decreased strongly in the past decades. Inpatient care is on average the greatest cost factor in Europe's health care systems. Therefore, much effort has been made in the last decades, to reduce costs for inpatient care. This includes a change of incentives through payment mechanisms for hospital care as the diagnosis related groups (DRG) and the reduction of hospital cases, which leads to a reduction in hospital beds and average length of stay.

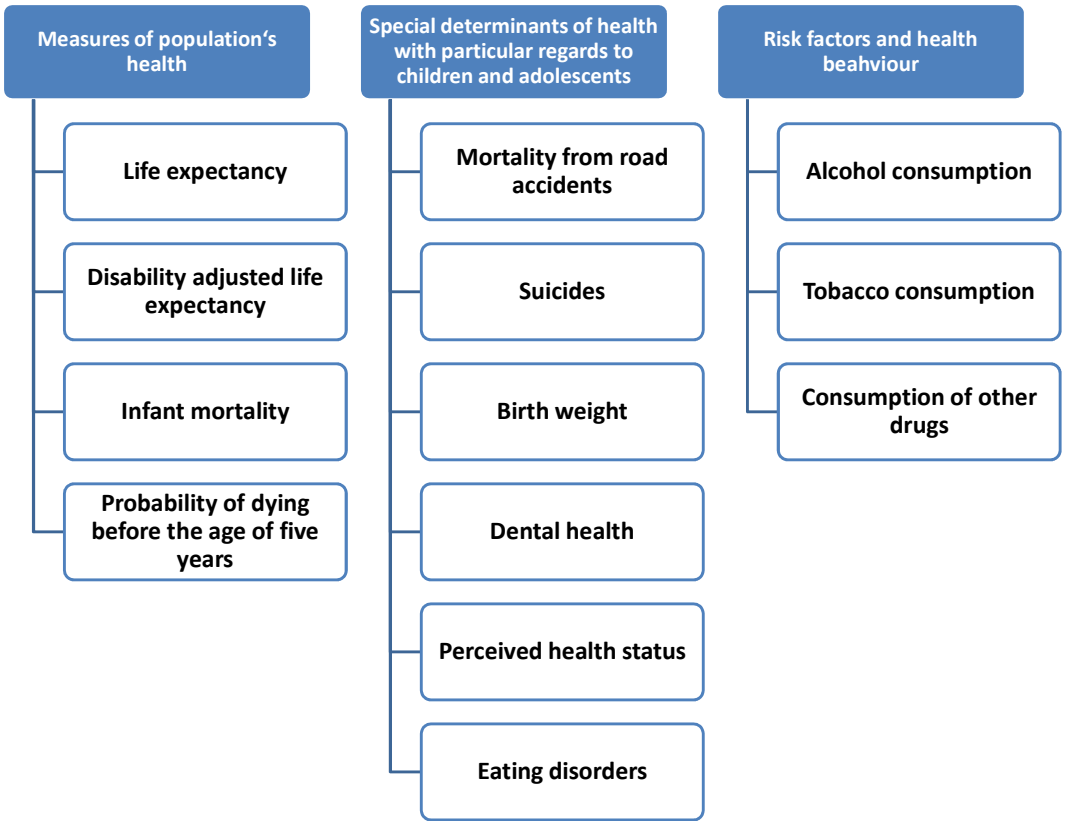
A reduction in hospital beds does not automatically imply a reduction in health care but can be explained by an increase in ambulatory care and by better, more efficient, diagnosis methods and therapy as well. Other ways of reducing the need for hospital beds are the coordination of disease management programs (DMP) and the direction of patients to more appropriate facilities (McKee, 2003). A Canadian study, which analyzed the impact of reducing hospital beds by 10% between 1991 and 1993, could not find evidence for worse access to hospital treatment, since an in-

crease in ambulatory surgery and earlier discharges (Roos, 1995). In a follow up study no evidence for a worsen health status of the population could be found (Brownell, 1999). A British study found out that in England, a reduction of hospital beds had a significant impact on hospitals ability to admit patients in emergencies (Hanratty, 1999).

2 Health Status of Children and Adolescents

The indicators of child health are based on those, described by Child Health Indicators of Life and Development (CHILD) (Rigby, 2002). As can be seen in Figure 2-1, the indicators are divided into three main groups. Firstly, measures of population's health status are going to be compared for the EU 27 plus Norway. These are the most common used indicators as life expectancy, disability adjusted life expectancy, infant mortality and probability of dying before the age of five years. Secondly, special determinants of health are going to be analyzed. Thirdly, in chapter 4 risk factors will be obtained. Especially the latter two groups are chosen with special regards to alcohol related health problems.

Figure 2-1: Health indicators for the total population in general and for children and adolescents in particular



2.1 Life expectancy at birth

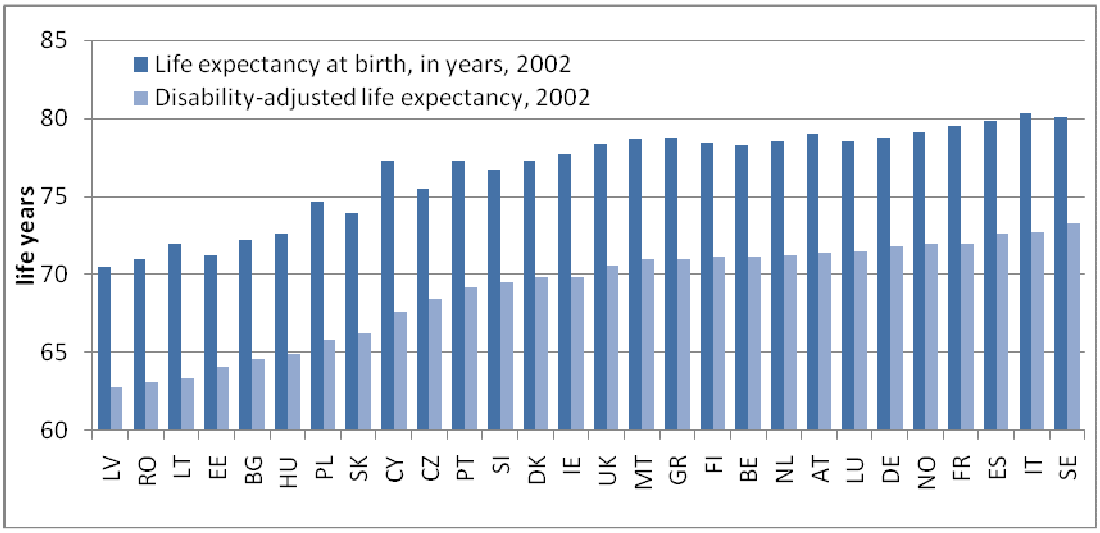
Before specifying the health status of children and adolescents in Europe and especially in the participating countries, life expectancy at birth (LE) shall be described. This parameter is often used as an indicator for the health of the population. LE is a measure for the average number of years an individual would be expected to live, if

current mortality rates continue to apply. Thus, LE reflects the overall mortality level of a population. It summarizes the mortality pattern that prevails across all age groups. LE varies from 70 years in Latvia in 2002 (Romania and Estonia 71 years; Lithuania and Bulgaria 72 years) to 79 years in Austria and Norway and 80 years in France, Spain, Sweden and Italy. It should not go unnoticed, that some countries are not able to ensure complete registration of all death cases and births. This leads to statistical bias. Countries using incomplete data about mortality show a higher LE, than it actually is.

Another measurement for life expectancy and health of the population is the disability-adjusted life expectancy (DALE). DALEs indicate the life expectancy in full health and are calculated by subtracting expected years of health life lost to disability from the overall life expectancy (Young, 2002). By this, DALEs introduce quality of life into the measurement of pure life expectancy. DALEs are computed based on age-specific information on the prevalence of non-fatal health outcomes. Therefore, life tables, population representative sample surveys assessing physical and cognitive disability and general health status, and detailed information on the epidemiology of major disabling conditions in each country are used. Thus, measurement of DALE requires a lot of data collection. A study from Reidpath et al (2003) points out, that due to the difficulties in data collection for DALE, the infant mortality rate (IMR) could be a better measure of population health, since there exists a strong negative linear correlation between DALE and IMR ($r=0.91$, $n=180$). In 2002, DALEs were highest in Norway, France, Spain, Italy and Sweden with 72 to 73 years and lowest in Latvia, Romania, Lithuania and Estonia with 63 to 64 years. The difference between LE and DALE is on average 7.7 in EU 27 plus Norway[3]. A notably high distance between LE and DALE can be observed in Lithuania with 8.66 years, in Poland with 8.85 years and in Cyprus with 9.7 years. Figure 2-2 shows LE and DALE for the EU 27 plus Norway sorted by DALE from lowest to highest.

[3] No Data about life expectancy is available for Belgium.

Figure 2-2: Life expectancy at birth and disability-adjusted life expectancy in years, 2002



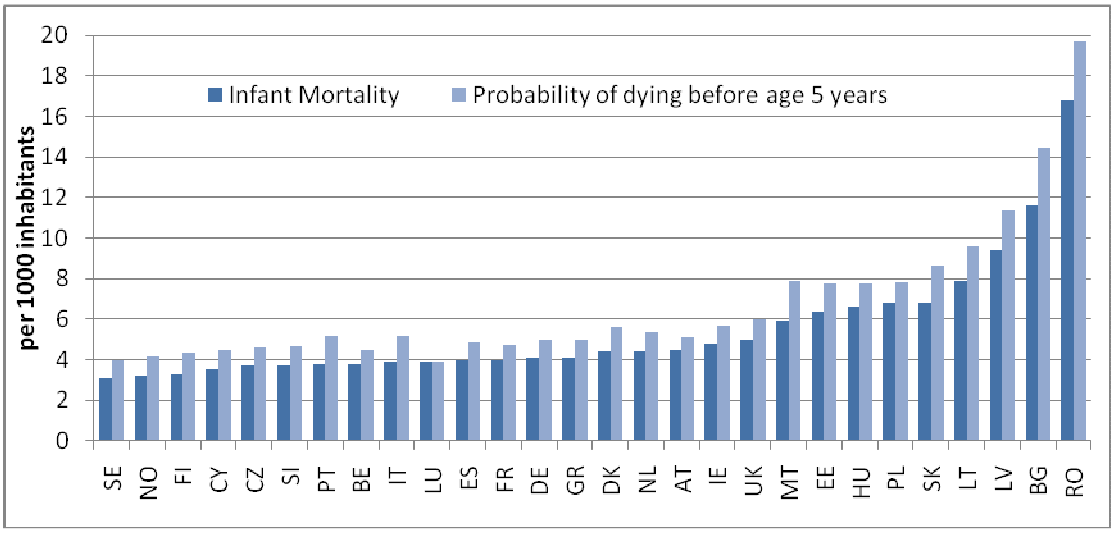
Source: HFA-DB. For BE Life expectancy: http://www.indexmundi.com/belgium/life_expectancy_at_birth.html
Life expectancy at birth: Data for DK: 2001.

2.2 Infant mortality

Infant mortality is defined as the ratio of the number of deaths of children less than one year of age during the year to the number of live births in that year. The value is expressed per 1000 live births. Here, again, comparability is limited due to the fact, that some countries do not have a complete registration of all mortality cases. Thus, some countries with underestimation of mortality may show lower probabilities of dying before the age of five years. Furthermore, there may be different definitions in national statistics of what a live birth is. Infant mortality among EU 27 plus Norway is highest in Lithuania, Latvia, Bulgaria and Romania (7.9, 9.4, 11.6 and 16.8 per 1000 live birth) and lowest in Sweden Norway, Finland and Cyprus (3.1, 3.2, 3.3 and 3.5 per 1000 live birth). Infant mortality rate is often used as an indicator of the health of the population and its living conditions, as it is assumed, that there is an association between standards of living in a country and its pattern of infant mortality (APHO, 2007).

The probability of dying before the age of five years differs from about 4 per 1000 live birth in Luxembourg, Sweden, Norway and Finland to about 10 in Lithuania, 11 in Latvia, 14 in Bulgaria and 20 in Romania. Figure 2-3 shows the probability of dying before the age of five years per 1000 live births and infant mortality in the year 2004, listed from lowest to highest and sorted by infant mortality.

Figure 2-3: Probability of dying before the age of five years per 1000 live births and infant mortality per 1000, 2004



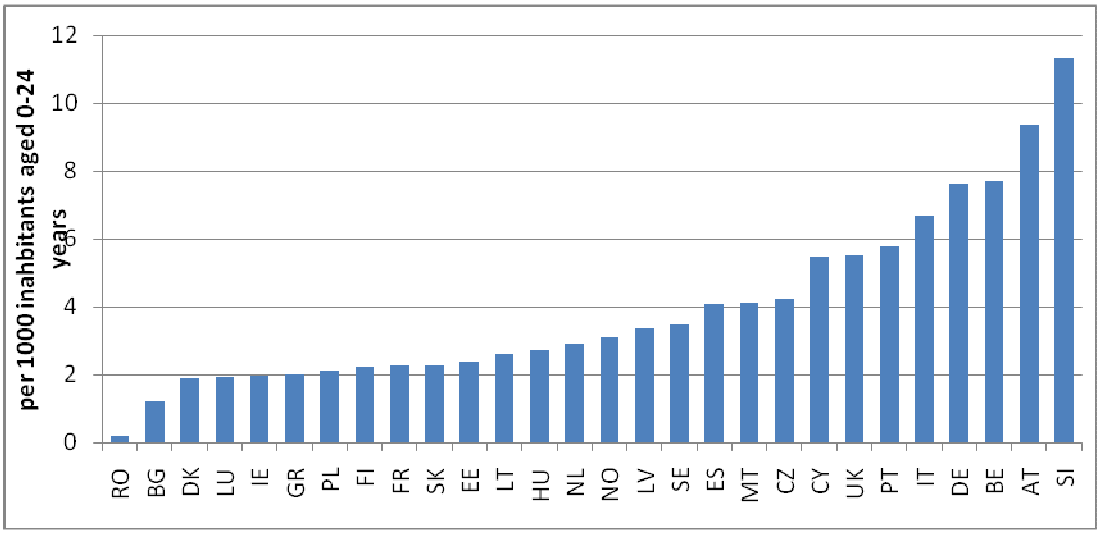
Source: Probability of dying before the age of five years: HFA-DB; Infant mortality: Eurostat. Probability of dying before the age of five years: Data for DK: 2001, IT: 2002. BE: Estimates from WHO World health report.

Another indicator, which measures the health of children and adolescents, is premature mortality. It is also very much linked to the infant mortality and probability of dying before the age of five indicators described above. Premature mortality is measured in terms of potential years of life lost (PYLL). Unfortunately, no systematic and coherent PYLL data is available for the European Union. A study from Rehm and Sulkowska (2007) found out, that alcohol accounts for 14.6% of all premature adult mortality in central and eastern European countries.

2.3 Mortality from road accidents

To measure all road fatalities the statistics included persons who were killed outright or within 30 days in cause of a road accident as a driver, a passenger or a pedestrian. Generally, the number of people who died in a road accident decreased in Europe in the last years. Still, for children and adolescents aged 0-24 years, the ratio of mortality from road traffic injuries (RTIs) in comparison to any other causes of death is quite high. Even in the European countries where RTI involving children are relatively seldom, 1 in 5 childhood injury deaths was caused by RTI in 2004 (WHO 2008a). Especially child pedestrians are endangered to be involved in a fatal accident. Figure 2-4 shows the number of road traffic injuries of children and young people aged 0-24 in 2004 EU countries. This numbers are standardized according to the number of people aged 0-24 in the respective country.

Figure 2-4: Standardized road traffic injury rates of children and young people aged 0-24 years in 2003

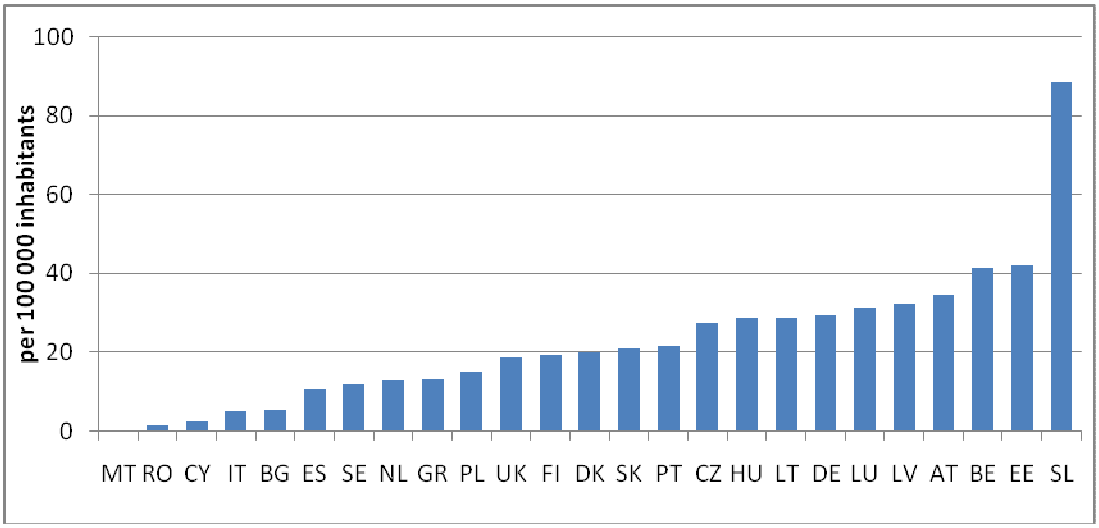


Source: Road traffic injuries for children and young people at the age of 0 to 24: UNECE statistical database. Number of persons aged 0-24: Eurostat.
Data for PL: 1996; BE: 2001; IE, IT: 2002; CY, MT: 2004.

This risk of mortality due to road traffic accidents correlates with the social class a child belongs to. Deprived children are over four times more likely to be killed as pedestrians than children that are more affluent are. This is true for each country, independently on the overall income level. Lone parenthoods, lacks of access to a car and a hazardous environment (e.g. busy roads with lack of safe crossing sites, location of schools beyond the community and no accessibility to safe play-areas) are also significant factors for disadvantaged children (White, 2000). In high-income countries, children account for 5-10% of all road traffic deaths. In low and middle-income countries, this number is raised to 30-40% (WHO, 2008a).

A high number of road traffic accidents are caused by alcohol consumption. In 2004, alcohol abuse causes 19.17% of all road accidents in Europe and even 25% of all fatal road accidents, that is annually up to 10 000 road deaths (ETSC, 2008). Figure 2-5 shows the number of road traffic accidents involving alcohol per 100 000 persons. It can be assumed that this indicator is dependent on others. The number of accidents involving alcohol may for example be dependent on drink driving laws and on report practices.

Figure 2-5: Road traffic accidents involving alcohol per 100 000



Source: WHO. Alcohol Control Database.
No data available for FR, IE, NO. Data for ES: 1992; MT: 1997; PT, BE; 1999; IT: 2002; RO, NL, DE, LU: 2003; all other countries: 2004.

2.4 Suicide

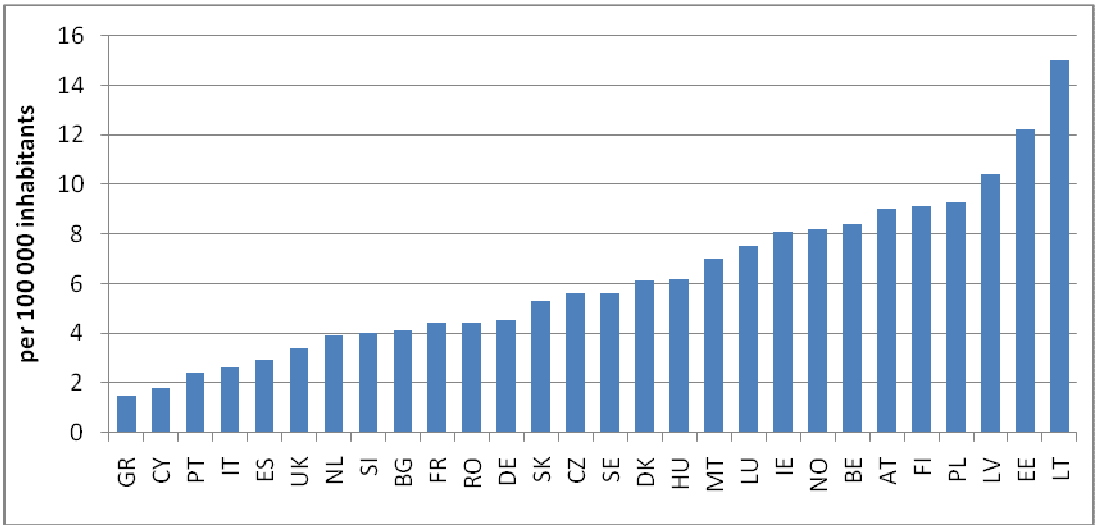
Suicide is a leading cause of death among young and middle-aged people in Europe. In 2005 the average suicide rate (age-standardized) is 10.8 per 100 000 population in the European Union (Eurostat, 2005). In young people aged 0-19 years suicide is the second highest external cause of death, which accounts for 14% among the male and 10% among the female deaths (Niederlaender, 2006). In the group of 20-44 years old, suicide is even the second major cause of all deaths. Among men in this age, it is actually the main factor of mortality.

There are basic risk factors for a suicidal tendency, which interact. Everybody reacts individually at risks, but generally the following factors evoke suicidal behavior: psychiatric factors (e.g. depression, schizophrenia and alcohol and other drug abuse), biological factors or genetic traits (e.g. family history of suicide), life events (e.g. loss of a loved one/ a job), psychological factors (e.g. interpersonal conflict, violence or physical and sexual abuse in childhood) and social and environmental factors including availability of means of suicide (e.g. firearms, toxic, gases and medicines) (WHO, 2005b). A cohort study of children in Denmark found out that children of alcoholics are more likely to attempt or commit suicide (Christoffersen, 2003). Many mental disorders have their beginnings in childhood. Consequently, adult children who grow up with an alcoholic are about twice as likely to commit suicide.

Figure 2-6 shows the number of suicides among 15-19 years old per 100 000 inhabitants in 2005. The lowest suicides rates among both sexes combined (aged 15-

19) are found in the Mediterranean region such as in Greece, Cyprus, Portugal, Italy and Spain (1.5, 1.8, 2.4, 2.6 respectively 2.9 per 100 000 inhabitants). In contrast, the highest rates for this age group are found in northeastern countries like Finland, Poland, Latvia, Estonia and Lithuania (9.1, 9.3, 10.4, 12.2 respectively 15 per 100 000 inhabitants). In the 27+1 European countries, the average suicide rate is 4.7.

Figure 2-6: Suicides among 15 to 19 years old per 100 000 inhabitants, 2005. Standardized death rate

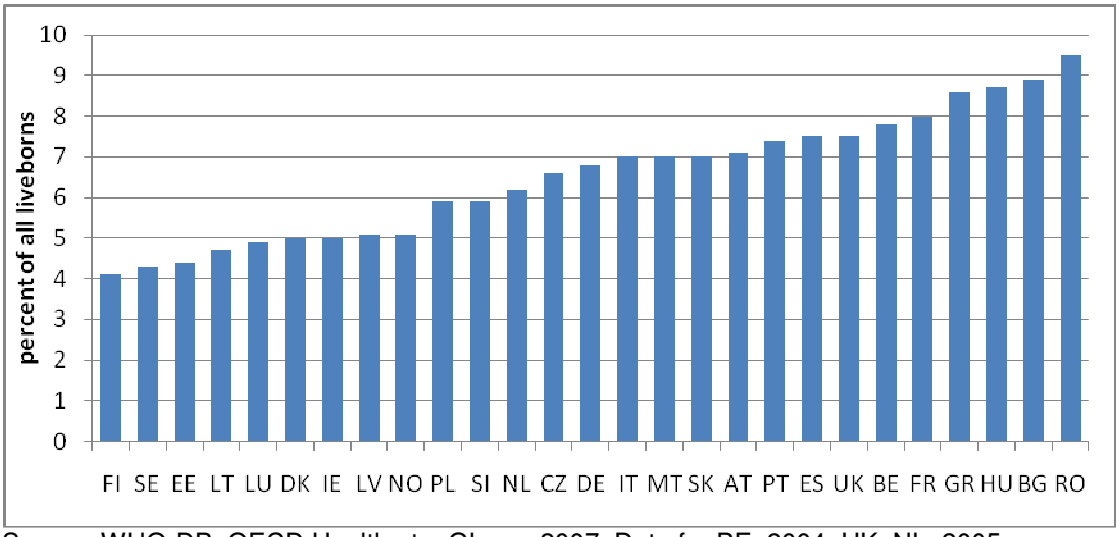


Source: Eurostat.
Data for IT: 2003; MT: 2004; DK: 2001; BG: 1999.

2.5 Infant health (low birth weight)

There are different indicators to measure infant health in a country. We already compared infant mortality and the probability of dying before the age of five years. Other indicators are infant breastfeeding, incidence of infectious diseases, live births and stillbirths. Another important indicator is the birth weight. Low birth weight is not only of interest for comparison of child health in different countries because it says something about complications during pregnancy and the health of the newborn within the first weeks. A low birth weight may also determine later disabilities and affections. Low birth weight is defined as the weight of an infant at birth of less than 2 500 grams irrespective of the gestational age of the infant. This is based on epi-demiological observations regarding the increased risk of death to the infant and serves for international comparative health statistics. Low birth weight has also an economical impact. The costs of health care for extremely premature infants (weighting less than 1 000 grams) are up to three times greater as costs for low birth weight infants in the first year of life (Lewit EM et al, 1995). Figure 2-7 shows the percentage of live born babies weighting less than 2 500 grams in EU 27+1.

Figure 2-7: Percentage of liveborns weighting less than 2 500 grams, 2003



Source: WHO-DB, OECD Health at a Glance 2007. Data for BE: 2004; UK, NL: 2005.

The number of low birth weight babies in cause of maternal alcohol consumption averages annually 60 000 in Europe (Anderson, 2006). Low birth weight as a consequence of alcohol consumption during pregnancy is a typical accessory symptom of fetal alcohol syndrome (FAS). FAS is known as one of the leading preventable causes of mental retardation and birth defects. Beside low birth weight, characteristics of FAS are: abnormal facial features, growth deficiency, and central nervous system (CNS) problems. Affected people can have specific learning difficulties, as well as disorders with their memory, attention span, communication, vision, hearing, or a combination of these. FAS take influence on the whole life of an invalid as well as for the close relatives of the person (CDC. 2006). The lifelong health costs for low birth weight infants and FAS affected children are very high. The extra cost of FAS has been estimates in the US at 500 000$ per individual over a 20-year period. The adjusted lifetime cost for each individual with FAS has been estimated at 2 million US$ (Lupton, 2004).

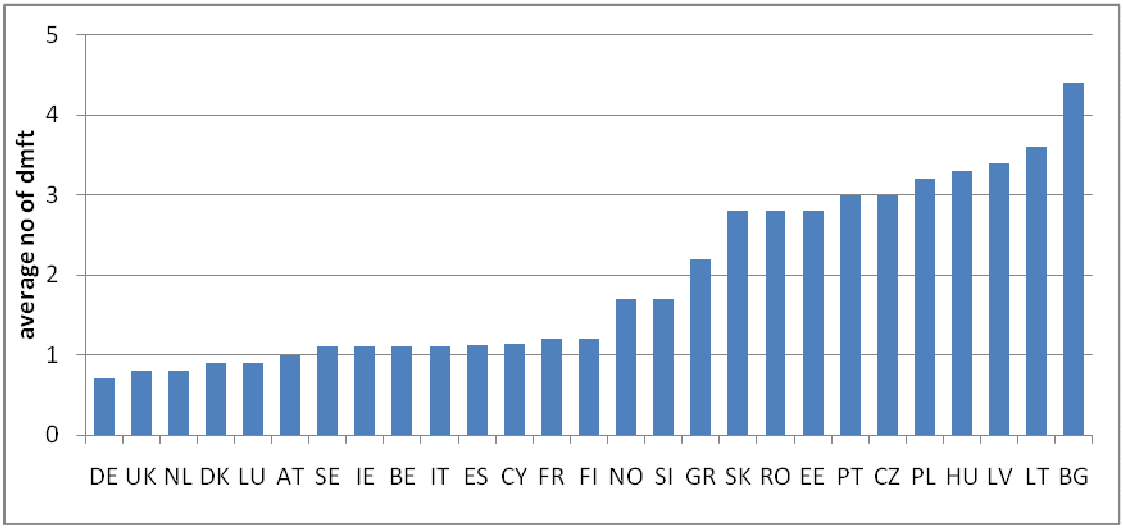
2.6 Dental health among children

Dental health is an elementary indicator of general health. Many gum diseases correlate with diseases in other areas in the body like diabetes, kidney disease, preterm births, osteoporosis, Alzheimer's disease and different types of cancer and increase the risk of heart attacks or strokes. This knowledge is not present in the population's awareness and is trivialized by many patients (Petersen, 2003). The oral health status among European children improved continually in the last 20 years (Petersen, 2003). For the comparison of the dental conditions, the DMFT-Index may be used. The DMFT-Index describes the total of dental caries in an individual. DMFT means

to numerically express the caries prevalence and is obtained by calculating the number of: Decayed (D), Missing (M) and Filled (D) teeth (T).

As can be seen in Figure 2-8, many European countries show relatively low values of DMFT. Values up to one (this means, that only one tooth is decayed, missing or filled) can be proved in Germany, United Kingdom, Netherlands, Luxembourg, Denmark, Austria, Sweden, Ireland, Belgium and Spain for 12 years old children in 2003. In Italy, France, Finland and Norway the average number of decayed, missing or filled teeth is between 1.2-2.6 still low. The highest values in the European 27+1 countries can be observed in Slovak Republic, Portugal, Czech Republic, Hungary and Poland with up to 3.8 decayed, missing or filled teeth. The DMFT index of 2.7-4.4 is defined as moderate, therefore none of the participating countries reaches the average number of 4.5 or more which is defined as high.

Figure 2-8: Average number of decayed, missing or filled teeth of 12 years old children



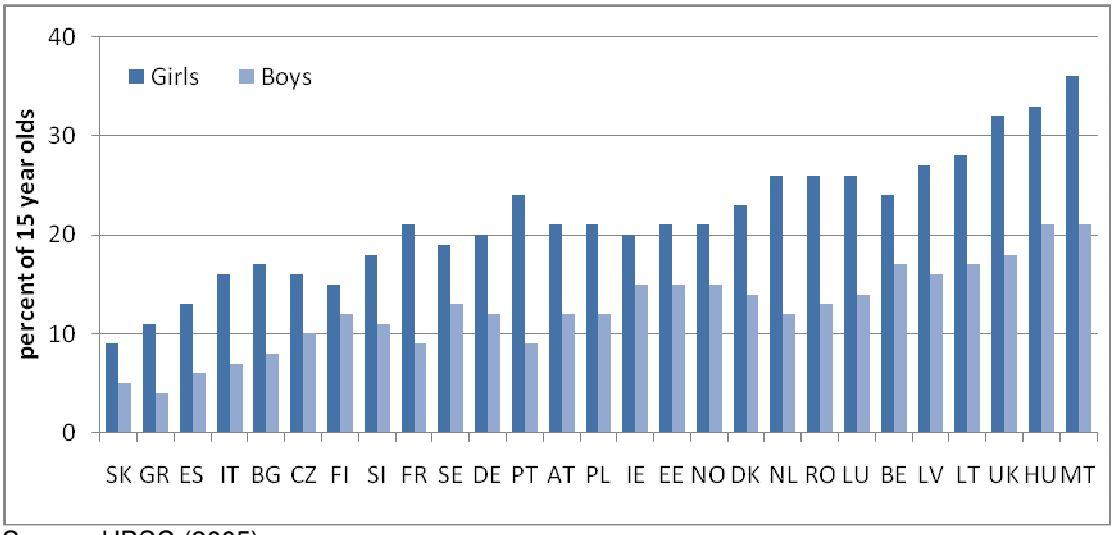
Source: OECD Health at a glance 2007
BG, ES, GR, PT, RO: 2000; AT, BE, HU, LT: 2001; IE, NL: 2002; IT, LV, NO: 2004; CY, 2005; FR: 2006. Others: 2003

Furthermore, dental caries is a common affection of socially disadvantaged children who do not have access to dental care (Vargas, 2006). Aspects as families' limited funds, easy access to sugar consumption and essentially parents' attitudes exert influence on the dental health. Studies found a relationship between parents of lower socio-economic status and a higher level of dental fear as well as a poorer dental knowledge in contrast to affluent parents (Arnrup et al, 2002). That is why systematic school-based preventive programs are important for dental health among children. In most European countries, dental caries is largely under control and the sugar consumption is not a major risk factor.

2.7 Perceived health status

Perceived health status can be used as a substitute to the overall health status of children and adolescents. In opposite to health insurance or hospital data, it is a pure subjective indicator. Thus, we cannot say anything about the performance of a health system by comparing perceived health status of a population, nor about the actual health status from a mere medical point of view. Perceived health status is very much connected to the mental conditions and social environment of the interviewee. Diseases in childhood can have several negative effects, which may last for a lifetime. These include social development as well as educational activity (HBSC, 2005). In a study about health behavior in school-aged children (HBSC), the WHO asked young people to describe their health within the categories “excellent”, “good”, “fair” and “poor”. Figure 2-9 shows the percentage of 15-year-olds who rate their health as fair or poor. In each country, girls rate their health worse than boys. Moreover, there are large cross-national differences in self reported health rates.

Figure 2-9: 15-year-olds who rate their health as fair or poor



Source: HBSC (2005).
For Belgium, only the Flemish population is included. No data available for CY.

The lowest number of girls who rate their health as fair or poor can be observed in Slovakia with 9% and in Greece with 11%. The lowest number of boys who rate their health as fair or poor can be observed in Greece with 4% and in Slovakia with 5%. Hungary and Malta are the countries with worst ratings of 33% and 36% for girls and 21% for boys. It can be shown, that a poor self-rated health is correlated to family affluence (HBSC, 2005).

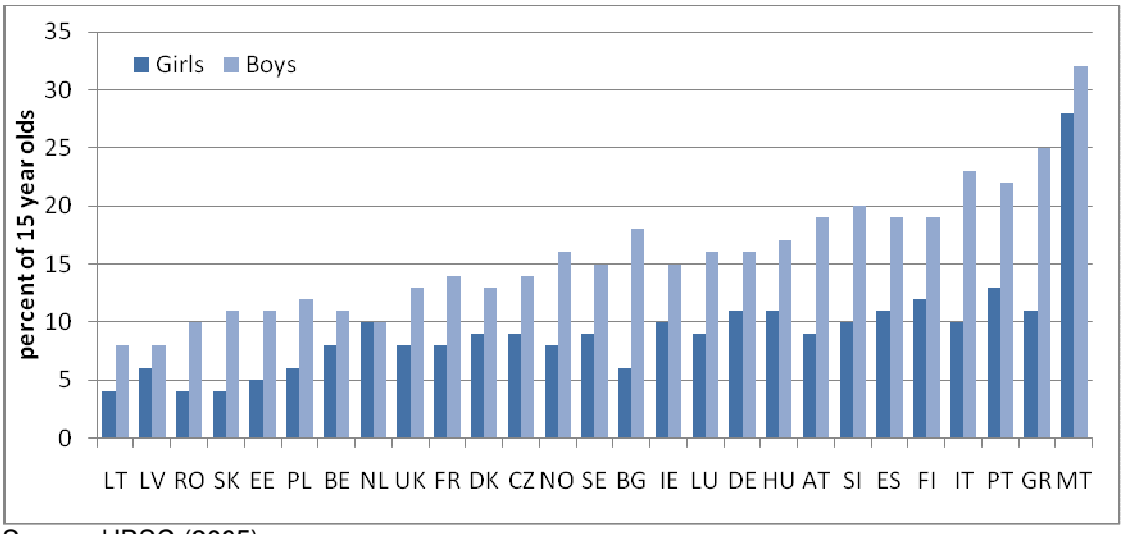
2.8 Eating disorders

Eating disorders are an increasing public health problem and require medical help. The most common eating disorders are anorexia nervosa and bulimia nervosa as well as obesity. The most affected persons are still adult women (Patton, 1999). A multitude of interacting biological, psychological, familial and socio-cultural factors can develop eating disorders in adults and in children (Major, 2000). Eating disorders often result in mental as well as physical damage and tend to become chronic (MacDonald, 2001). Most common risk factors like repeated dieting, teasing about weight, low self esteem problems, losses and major life events, family dysfunction (Nicholls, 2005) and the influence of media (Jade, 2002) might lead to an eating disorder.

A frequent deception to measure a healthy weight of a child or an adolescent is the body mass index (BMI= (kg/centimeter^2)). Unfortunately, the index is general and does not consider an eating disorder. It is also incorrect for people with a big body frame or who are highly muscular. They can have a high BMI but a low fat mass; therefore, a waist circumference also should be taken into account (Nicholls, 2005). Nevertheless, the BMI is a relatively good and easy way to measure overweight and obesity as well as underweight. Figure 2-10 shows the percentage of 15-year-olds with overweight or obesity according to BMI. BMI was calculated by information about height and weight, which were given by adolescents in a questionnaire for the study about health behavior in school-aged children (HBSC) from WHO. It can be seen, that on average, Lithuania, Latvia and Romania have fewest, and Malta, Greece and Portugal have most adolescents with overweight and obesity.

A study by Chandy et al (1994) found out, that parental misuse of alcohol could lead to disordered eating behaviors of children. In this study, a higher prevalence of eating disorders in female adolescent children was observed for children of alcoholics in comparison with children of non-alcoholics.

Figure 2-10: Percentage 15-year-olds who report that they are overweight or obese according to BMI



Source: HBSC (2005).
For Belgium, only the Flemish population is included. No data available for CY.

2.9 Maternity and Child welfare

Finland has an interesting way to enhance maternity and child health care. Maternity clinics monitor the physical and mental health of the mother and the unborn child and provide trainings for parents (Ministry of Social Affairs). To qualify for a maternity grant, mothers have to undergo a medical examination before the end of the fourth month of pregnancy. After the child is born, a public health nurse from the local maternity clinic will visit the family and provides information about bringing up children and managing with live. The child and family then become clients of the child welfare clinic. Child welfare clinics monitor and support the physical, mental and social development of children, and if necessary arranges for them to be examined and receive treatment elsewhere. A doctor will examine infants under a year old 2-3 times and then every second or third year until the child is seven. Older children are part of the school healthcare system. Child welfare clinics vaccinate children under the national vaccination program. A finish study analyzed finish families' need for special support (Häggman-Laitila, 2003). The nurses working in maternity and child welfare clinics evaluated the need for special support. The study shows, that 54% of the families had problems coping with parenthood and family structure. 30% expressed difficulties with raising their children and with childcare. In 15% of the cases, parents needed help because of parental use of alcohol.

Denmark provides maternal and child health services free of charge (Strandberg-Larsen, 2007). Health professionals decide about the needed visits of pregnant women. The municipalities are responsible for providing and financing examinations for children, which take place in the child's home, carried out by a health visitor. Health checks for schoolchildren are offered as well.

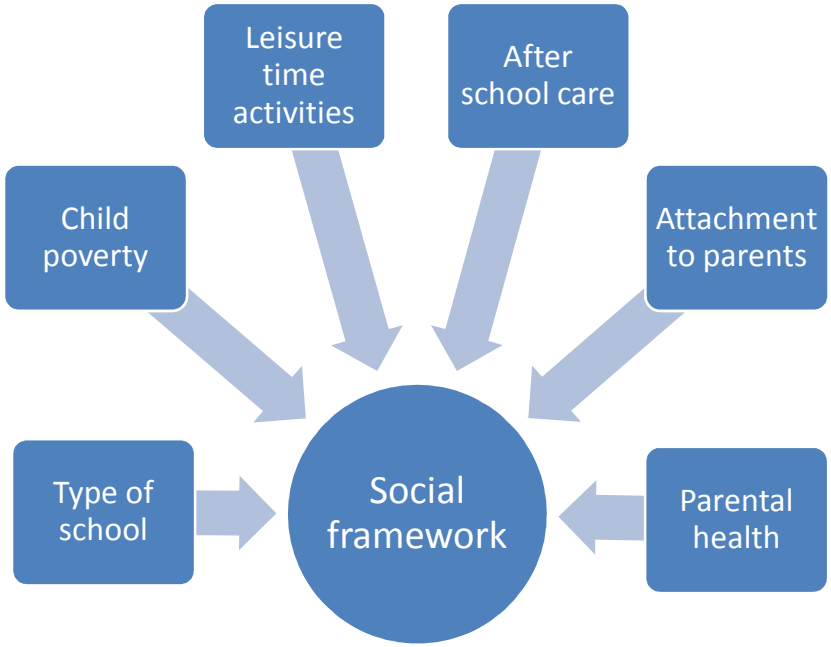
In Belgium, the Flemish community provides an independent agency, Child and Family (K&G), which is responsible for preventive health care for children (Corens, 2007). K&G examines the children, provides free vaccination and gives accreditation and subsidies to specialized centers in case of child abuse. In the French community the Birth and Childhood Organization (ONE) provides antenatal services and consultations for children up to six years old, as well as prevention services and vaccination. These services are free of charge. A similar system is prevalent in Cyprus (Golna, 2004). In the Flemish and French communities, school medical inspection is compulsory in every nursery, primary and secondary school until the age of 18 years.

More research has to be done regarding the impact of obligatory examinations for pregnant women, babies and young children.

3 Social Framework for Children and Adolescents

The public health perspective on alcohol consumption has to take environmental factors into account, because they can explain consumption of alcoholic beverages against the background of socioeconomic context and can provide starting points for prevention activities. The concept of social framework provides a set of indicators.

Figure 3-1: Some possible characteristics of social framework for children and adolescents in Europe



This list of indicators can be broadened by a lot of further characteristics as political system, access to food, water, education, medical care etc. Since the European member states are on a comparable level according to these indicators, we are not going to observe them. Furthermore, we have to concentrate on indicators which are comparable, ascertainable and which are assumed to have an effect on harm done by parental alcohol consumption or vice versa. According to this, we concentrate on child poverty and on parental health, which is analyzed with regards to alcohol abuse.

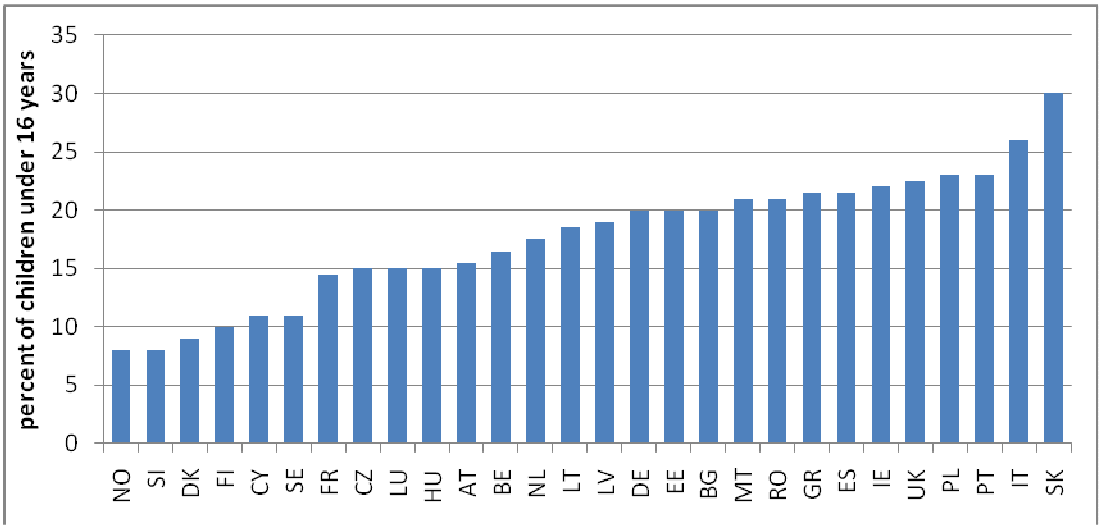
3.1 Child poverty

Children living in households with a household income of less than 60% of the national median are defined as children living in poverty. Child poverty in rich countries e.g. in Europe is difficult to distinguish and should be measured on a national level.

There is some evidence that from the public health point of view, the major economical challenge in rich countries is the reduction of inequalities rather than further economic growth. In a study from Pickett et al (2007), the overall index of child well-being among the 51 US states was negatively correlated with income inequality and percentage of children living in relative poverty.

Figure 3-2 shows the percentage of children living in households below 60% of contemporary national median income. This share is especially high for Portugal, Italy and Slovakia with 23% (26%, 30%) percent of children. Norway, Slovenia and Denmark show rather low numbers of children living in poverty of 8% (NO and SI) and 9%.

Figure 3-2: Percentage of children (under 16 years) living in households below 60% of contemporary national median income 2003/04



Source: Eurostat 2003-04: average of median equalized income after social transfers. Malta :2001.

But also several studies show, that there is a strong relationship between the socio-economic status of children measured by family income and health and well-being during childhood, adolescents and even adulthood (Currie et al, 2003; Case et al, 2003). A low socioeconomic status can for example have negative influences on infant mortality, low birth weight, dental health, child mortality due to unintentional injuries, juvenile homicide, educational attainment, dropping out of school, participation in higher education, peer relations, physical activity, childhood obesity, mental health problems, behavioral development and drug consumption (Emerson, 2009; Currie et al, 2003; Gillcrist et al, 2001; Curie, 2008). This shows that each area of live can be affected by poverty in childhood: physical and psychological health, education (human capital) and behavior.

3.2 Number of Children Living in a Family with at Least one Alcohol-dependent Parent

As we described above, it is very difficult to estimate the number of problem drinkers in a population. This makes it even more complicated to estimate the number of children living in a family with one or two alcohol dependent parents. Additionally, not every child of an alcohol dependent also lives in the same household with the affected parent.

Grant (2000) estimated for US children, that about 15% of all children lived together with an alcohol depend parent in the last year and about 43% lived together with a parent who had a lifetime prevalence of alcohol disorder. Alcohol consumption per capita was about 8 liters in US in 2000, such that an equal or even higher prevalence for countries with higher per capita consumption can be assumed. A European study from 1998 estimates that at least 4.5 million children in European Union are living in families with alcohol-affected parents. Regarding the estimated number of unreported cases, 7.7 million children may be affected in Europe (Eurocare, 1998).

Harwin et al (2009) gathered data from country reports in the ChAPAPs project and examined available information on the numbers of children affected by parental alcohol problems including those affected by fetal alcohol spectrum disorder. According to Harwin, only Lithuania and Poland, two of the three partner countries of the former Soviet Union, reported that their government collects data on national child prevalence rates. Using survey data collected by the Government drug control department, Lithuania reported that 18,941 children grow up in families affected by parental alcohol misuse, representing 2.7% of the total under 18 year old child population in 2006. In Poland, the rate, according to the State Agency for the Prevention of Alcohol-Related Problems, is 19.3% of children aged 0-18 years.

Scotland, Finland and Denmark drew upon large-scale household surveys to estimate prevalences of ChAPAPs. From these self-report surveys, Finland is able to report that around one in ten members of the population grows up with parents who misuse alcohol (Peltoniemi, 2005). A survey in Germany over a decade ago estimated that 2.65 million children below 18 years live with a parent affected by alcohol misuse or dependency over their lifetime. This suggests that one in 7 adolescents, or around 15%, is living with a parent with alcohol problems (Lachner et al, 1997). In Ireland, a nationally representative survey of adults aged 18-40 found that between 7% and 8% reported feeling afraid or unsafe, witnessing parental conflict, and/or having to take responsibility for a parent or sibling as a result of parental alcohol

use. When parents drank weekly or more often, the prevalence rate rose to 11-14% (Behavior and Attitudes, 2009).

According to the results of Harwin et al, another approach to establishing the prevalence of ChAPAPs was reported by Austria and Norway calculating rates from the number of parents in alcohol treatment. Respondents suggested that this approach was likely to underestimate the true scale of the problem.

A few countries (Belgium, Ireland, Spain and England) stated that they did not collect firsthand information on prevalence but extrapolated their rates from the COFACE and EUROCARE survey undertaken as part of a 1998 study entitled Problems in the Family: A report to the European Union (Eurocare and Coface, 1998). This study used Danish and Finnish prevalence survey data to produce an estimate of approximately one in ten children affected by parental alcohol misuse in Europe. On this basis, between 12% and 21% (4.5 million to 7.9 million children) of the total under 15 years population (37.6 million) in the EU is living in households affected by alcohol. Partner countries in the present project were critical of reliance on COFACE to extrapolate national rates as this produced a uniformity that is not shown by countries that collect first-hand data.

4 Alcohol, Tobacco and Illicit Drug Abuse

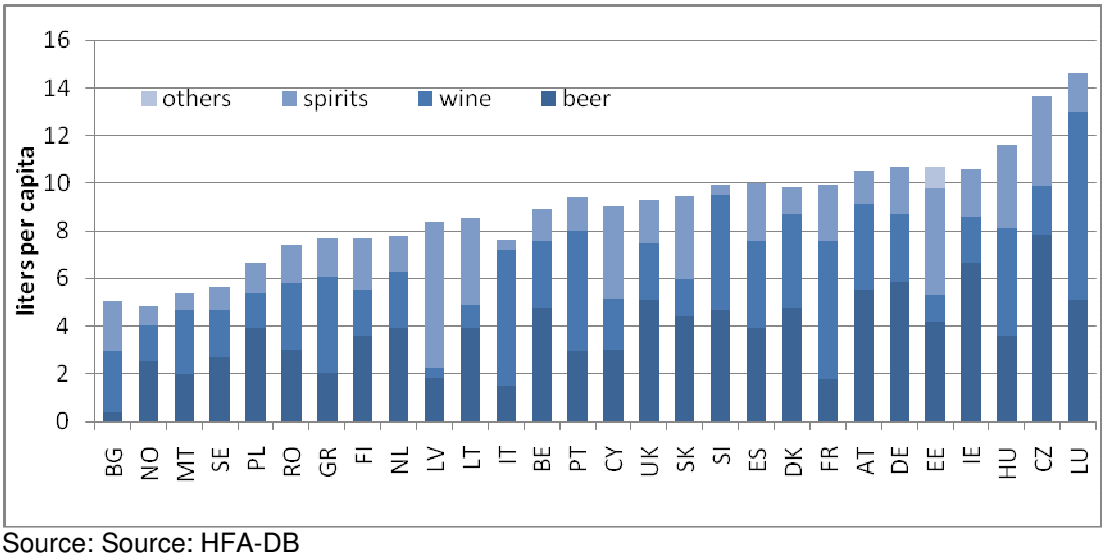
4.1 Alcohol consumption

From a public health point of view, alcohol consumption triggers serious negative health outcomes in nearly each part of the world. More than 60 types of disease and injury can be related to alcohol consumption (WHO, 2004). This includes chronic diseases and traumatic health outcomes as disability or dead at young age. Alcohol is estimated to cause about 20–30% of esophageal cancer, liver cancer, cirrhosis of the liver, homicide, epileptic seizures, and motor vehicle accidents worldwide (WHO, 2002). As it is estimated by WHO, alcohol causes 3.2% of death worldwide and 4.0% of disease adjusted live years (DALYs)[4]. In European Union 10.8% of disease burden in DALYs are estimated to be caused by alcohol consumption (WHO, 2005a). Therefore, the negative effects of alcohol consumption highly overweigh positive effects as for example positive effects on the risk of ischemic stroke (Elkind, 2006). Especially alcohol intoxications are a powerful mediator for several kinds of negative social and health outcomes. This includes traffic accidents and domestic violence, which, again, leads to negative effects on the mental and physical health of children. Alcohol consumption is claimed as third largest risk factor for disease burden in developed countries and accounts 10.1% of total years of life lost in the European Region (WHO, 2007a). In Europe, alcohol consumption was responsible for 55 000 deaths among young people aged 15-29 years in 1999 (Rehm, 2002).

The pure alcohol consumption in liters per capita is defined as the estimated amount of pure ethanol in spirits, wine, beer and other alcoholic drinks consumed per capita in a country during a calendar year, as calculated from official statistics on local production, sales, import and export. The data about pure alcohol consumption in this catalogue is taken from HFA-DB. Whenever possible, stocks and home production were taken into account. The conversion factors that were used to estimate the amount of pure alcohol in beer is 4.5% and in wine 14% of alcohol. Data were collected mainly from three sources: World Drink Trends regularly published by Produktschap woor Gedistilleerde Dranken (Schiedam, Netherlands), Food and Agriculture Organization and data reported directly by the WHO national counterparts. Additional data are available in the specialized Alcohol database maintained by WHO/EURO Alcohol and Drugs unit and/or in corresponding Global Alcohol Database maintained by the WHO Headquarters in Geneva.

[4] DALYs remark the sum of years of life lost through premature mortality and the years of life lost due to disability. One DALY represents the loss of one year of equivalent full health.

Figure 4-1: Alcohol consumption (pure alcohol in liters per capita) in 2003



Source: Source: HFA-DB

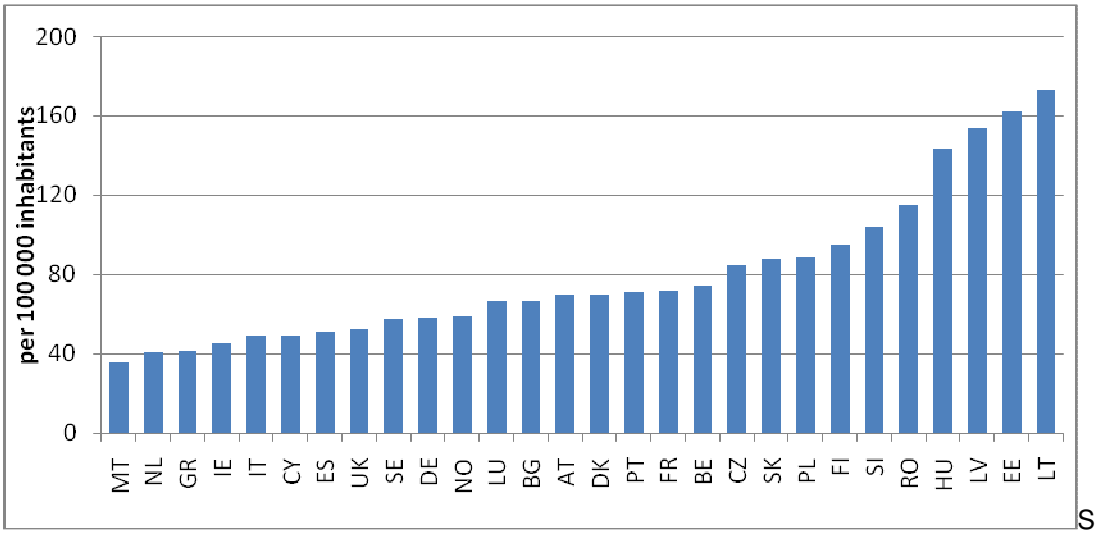
As can be seen in Figure 4-1, alcohol consumption measured in pure alcohol in liters features a broad variety over the EU 27+1 countries. Least alcohol consumption is reported for Norway, Bulgaria and Malta, with 4.8, 5 and 5.4 liters per capita. Highest alcohol consumption is reported for Hungary with 11.6, Czech Republic with 13.7 and Luxemburg with 14.6 liters per capita. It has to be taken into account that these results are susceptible to statistical bias, as home production may be underreported and underestimated in some countries. It is estimated, that 55 million adults drink at harmfully levels in EU and alcohol is responsible for approximately 195 000 deaths a year (European Commission, 2006a). A harmfully level is defined as more than 40 grams alcohol per day for men, which corresponds to four drinks a day, and 20 grams alcohol for women. Harmful alcohol level means, that from this level onwards, loss of health may occur. Harmful alcohol consumption is thus a major risk factor for premature mortality and loss of healthy life years. The European Commission estimates it to be the third biggest cause of early death and illness in the EU, behind tobacco and blood pressure diseases.

It is noticeable, that alcohol consumption is rather uneven distributed among the population. An above-average consumption can be traced back to binge drinking behavior. Binge drinking is defined as drinking occasion with heavy alcohol consumption, for example consumption of at least 60g of alcohol or more than 5 drinks etc (DHS, 2008). Binge drinking is correlated to violence and intoxication. An estimation of problematic drinking behavior is very difficult. Surveys about drinking behavior mostly collect information about numbers of alcoholic drinks. However, alcoholic drinks vary broadly in their alcohol content and the same beverage may be served in different sizes. Moreover, it could be observed, that self-reports of alcohol

consumption can only explain about 50% of the reported sales of alcohol (Chick et al, 2007).

As an indicator for heavy alcohol consumption we examine the standardized death rates (SDR) for selected alcohol related causes per 100 000 of the population in 2004 (see Figure 4-2). Standardization was carried out regarding to population size and age. This calculation sums up all illnesses that may have been triggered by alcohol consumption. Actual deaths by alcohol cannot be read of this summation. Additionally, SDR may vary because of unequal quality of health care in the observed countries. Included diseases are Cancer of esophagus and larynx; Alcohol dependence syndrome and chronic liver disease and cirrhosis. Malta, Netherlands and Greece have least numbers of deaths for selected alcohol related causes with 36 to 41 per 100 00 of the population. Latvia, Estonia and Lithuania show 153, 62 and 173 deaths per 100 000 inhabitants.

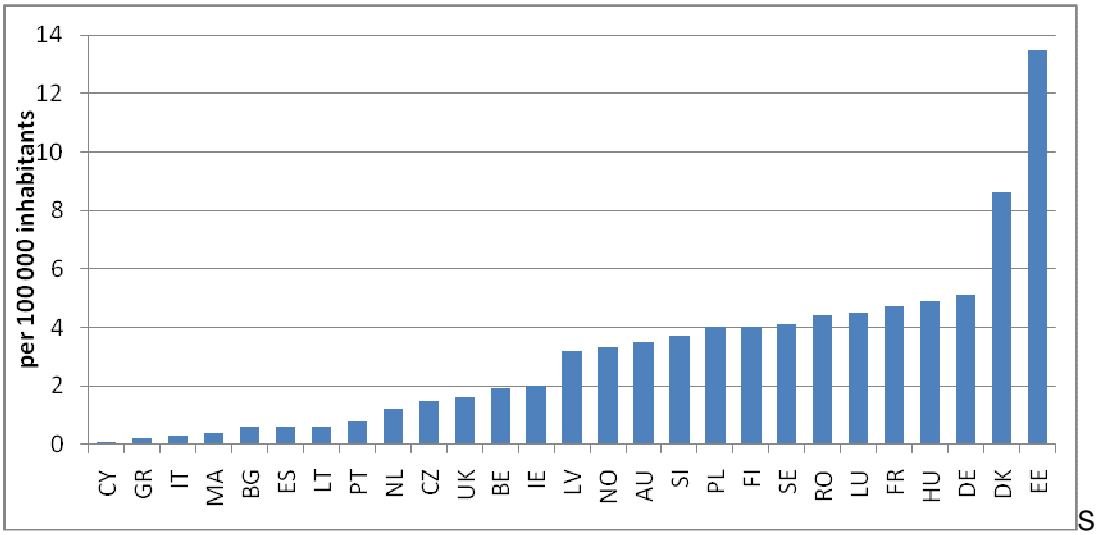
Figure 4-2: SDR for selected alcohol related causes per 100 000, 2004



Source: HFA-DB.
Data for BE: 1999; data for IT: 2003; data for PT: 2003.

As another indicator for heavy alcohol consumption, we contemplate the standardized death rate for alcohol abuse per 100 000 of the population (see Figure 4-3Figure 4-2). Cyprus, Greece and Italy have least numbers of deaths by alcohol abuse with 0.1 to 0.3 per 100 000 of the population. Germany, Denmark and Estonia show 5.1, 8.6 and 13.5 deaths per 100 000 inhabitants.

Figure 4-3: SDR for alcohol abuse per 100 000 of the population, 2005



Source: OECD yearbook 2008.
Data for BE: 1995; DK: 2001; IT: 2002; RO: 2003; FI, SE: 2004. No data available for SK.

Rehm et al (2005) analyzed the epidemiology and prevalences of alcohol use disorders in EU 27+1. Therefore, alcohol dependence, alcohol abuse and harmful alcohol use were examined. For alcohol dependence, a clear definition by ICD-10 was used. This definition states a person as alcohol dependent, if at least three of the following have been experienced at some time during the previous year:

- A strong desire or sense of compulsion to take alcohol;
- Difficulties in controlling alcohol-taking behavior in terms of its onset, termination, or levels of use;
- A physiological withdrawal state when alcohol use has ceased or been reduced, as evidenced by: the characteristic withdrawal syndrome for alcohol; or use of the alcohol with the intention of relieving or avoiding withdrawal symptoms;
- Evidence of tolerance, such that increased doses of alcohol are required in order to achieve effects originally produced by lower doses (clear examples of this are found in alcohol-dependent individuals who may take daily doses sufficient to incapacitate or kill nontolerant users);
- Progressive neglect of alternative pleasures or interests because of alcohol use, increased amount of time necessary to obtain or take alcohol or to recover from its effects;
- Persisting with alcohol use despite clear evidence of overtly harmful consequences, such as harm to the liver through excessive drinking; efforts should be made to determine that the user was actually, or could be expected to be, aware of the nature and extent of the harm.

The diagnostic and statistical manual of mental disorders IV (DSM-IV) defines alcohol abuse. Accordingly, alcohol abuse can be diagnosed if one (or more) of the following, occurring within a 12-month period:

- Recurrent substance use resulting in a failure to fulfill major role obligations at work, school, or home (e.g., repeated absences or poor work performance related to substance use; substance-related absences, suspensions or expulsions from school; neglect of children or household)
- Recurrent substance use in situations in which it is physically hazardous (e.g., driving an automobile or operating a machine when impaired by substance use)
- Recurrent substance-related legal problems (e.g., arrests for substance-related disorderly conduct
- Continued substance use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance (e.g., arguments with spouse about consequences of intoxication, physical fights)

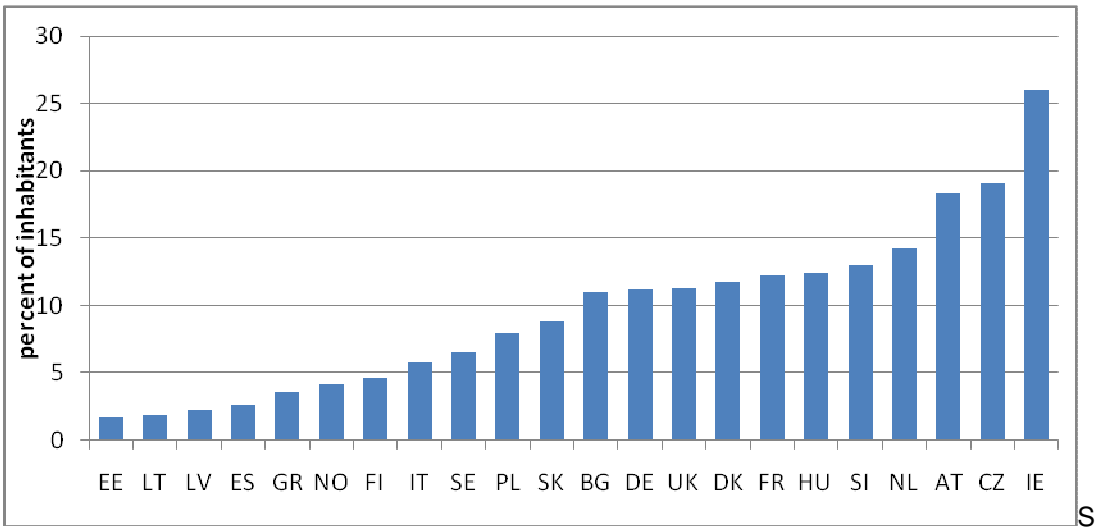
Harmful alcohol use is defined by ICD-10. Following criteria have to be fulfilled:

- There must be clear evidence that the substance use was responsible for (or substantially contributed to) physical or psychological harm, including impaired judgement or dysfunctional behaviour, which may lead to disability or have adverse consequences for interpersonal relationships.
- The nature of the harm should be clearly identifiable (and specified).
- The pattern of use has persisted for at least 1 month or has occurred repeatedly within a 12-month period.
- The disorder does not meet the criteria for any other mental or behavioural disorder related to the same drug in the same timed period (except for acute intoxication).

Furthermore, WHO has published global status reports on alcohol for each European country plus Norway. These status reports consider heavy and hazardous drinkers, partly among drinkers and partly among total population. Additionally some of the status reports consider alcohol dependence, again partly among drinkers and partly among total population. These data is quite problematic, since differing methods of collecting data and different populations (only drinkers or total population) were observed. Moreover, definition of hazardous alcohol consumption and alcohol dependence differs. Some countries define hazardous alcohol consumption by number of drinks a day or a week; others compute pure alcohol consumption a day and define hazardous consumption by either 40 grams or 60 grams a day for men and 20 grams or 40 grams a day for women; again others even take 80 grams a day as benchmark. Alcohol dependence is sometimes defined as alcohol dependence plus problem drinking and sometimes without. Furthermore, estimations about unrecorded alcohol consumption differ very much among countries, such that a comparison of alcohol consumption, hazardous alcohol consumption and alcohol dependence is very much limited. Figure 4-4 shows the prevalence of alcohol consumption

in the European Union countries as indicated in the WHO global status reports on alcohol.

Figure 4-4: Heavy and hazardous drinkers in percent of the population



Source: WHO global status reports on alcohol.
No Data available for CY, LU, MT, PT, BE, RO.

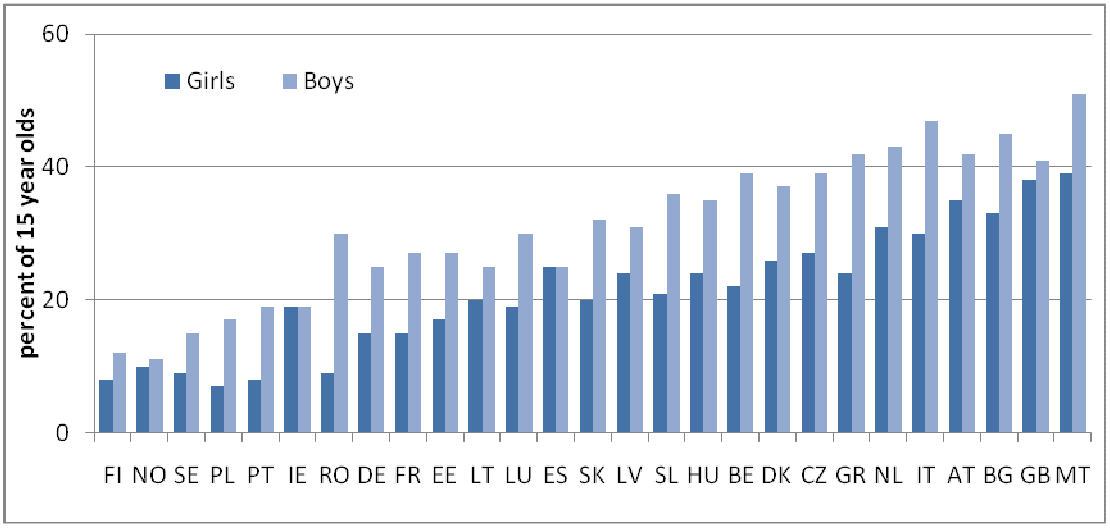
In summary, the available data on prevalences of alcohol abuse, hazardous drinking and alcohol dependence are quite poor. Although each country in EU has some statistics about alcohol consumption, data are not comparable due to a missing adjustment of definitions. More research must be done on this issue.

The major risk of alcohol consumption for children in the society is the consequence for unborn life. Drinking during pregnancy can have negative effects on brain development of the fetus. A common sequela is the fetal alcohol spectrum disorder (FASD), which includes fetal alcohol syndrome (FAS). Most industrial countries have FAS prevalences of 0.5‰ to 2‰ of all newborns (May et al, 2001). These data hold true for fully developed FASD. If we take indication of several characteristics of FASD into account, we can anticipate even higher numbers of FASD affected children.

Figure 4-5 shows the percentage of 15-year-olds who drink alcohol at least once a week in EU 27+1 countries. We can observe considerable differences of alcohol consumption among 15-year-olds within the European member states. The Scandinavian countries Finland, Norway and Sweden display rather low prevalences for 15-year-olds of averagely 10% to 12% whereas Bulgaria, England and Malta have high prevalences of averagely 39% to 45%. There are partly big differences in prevalences for boys and girls. Obviously, weekly alcohol consumption is more common among boys. A high share of binge drinking occasions can be observed in

young people's drinking behavior. Binge drinking defined as 60 grams alcohol on an occasion is the average pattern of drinking of 15-16-year-olds in the EU (DHS, 2008).

Figure 4-5: 15-year-olds who drink alcohol at least once a week



Source: HBSC 2005.
For Belgium, only the Flemish population is included.

Alcohol consumption is a major risk factor for young people. The European commission estimates, that 1 out of 4 deaths among young men aged 15 to 29 years is due to alcohol (European Commission, 2006a). Reasons may be road traffic accidents, which are caused by alcohol as well as homicide, violence, suicides etc. Drinking behavior of children and adolescents is dependent on drinking behavior of parents. The probability to develop an alcohol disorder is six times higher for children from alcohol dependent parents (Lachner, 1997).

Beside health problems as for example intoxication, high alcohol consumption among children and adolescents can have negative effects on children's mental health. Hospitalization because of mental and behavioral disorders among 15-19-year-olds reaches averagely 0.58 per 1 000 in Europe (ICD10 diagnosis).

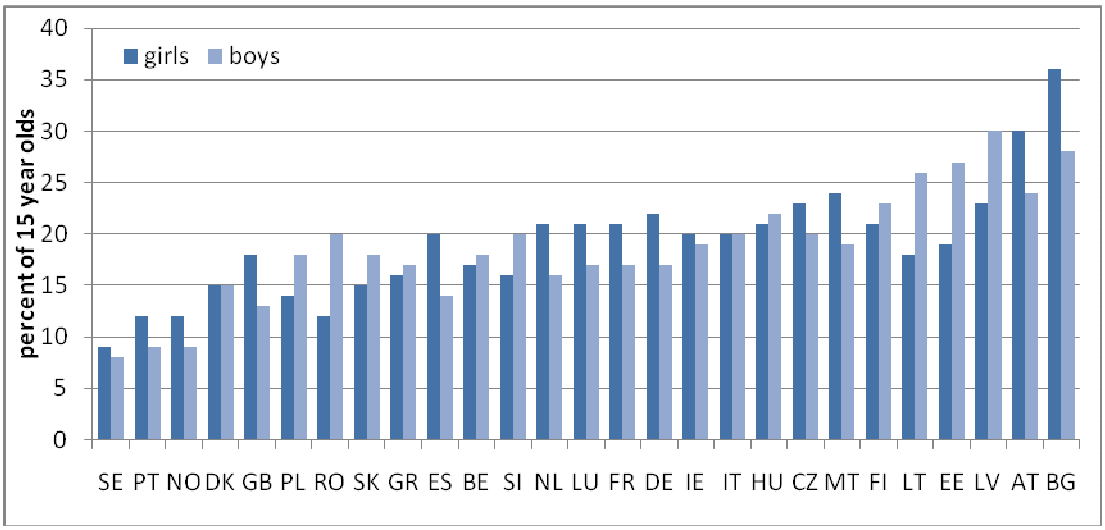
4.2 Tobacco consumption

Tobacco use is responsible for about 10% of deaths of adults worldwide (WHO 2002b). It is the major cause of many of the world's most dangerous and killing diseases as cardiovascular disease, chronic obstructive lung disease and lung cancer. The world health report estimates smoking to be the second most important risk factor after high blood pressure for total years of life lost measured by premature mortality and years lived in disability (DALY) (WHO, 2002b). Accordingly, tobacco

consumption accounts for 12.3% of total life lost in the European Region, which equates to about 18.6 million years of life lost. The direct and indirect costs of smoking in the European Region are estimated to range between 1.04 and 1.39% of Europeans GDP which corresponds to 97.7 to 130.3 billion Euros in 2000 (WHO, 2007a).

The total adult prevalence in percent ranged heavily from 16% in Sweden to 47% in Austria between 2002 and 2005 in EU 27+1 (WHO tobacco database). Parental tobacco consumption can lead to serious health problems in children and adolescents. Tobacco consumption during pregnancy can lead to low birth weight and illnesses among infants. Additionally, children of tobacco consuming parents have a higher chance to develop tobacco dependence (Courtois et al, 2007).

Figure 4-6: 15-year-olds who smoke at least once a week



Source: HBSC (2005)
For Belgium, only the Flemish population is included.

According to HBSC, smoking prevalence of young people was about 19% on average in European Union with no appreciable difference in prevalences of girls and boys. Smoking prevalence was measured as percentage of boys and girls at age of 15 smoking at least once a week. As can be seen in Figure 4-6, there are considerable variations between countries, from 8% boys and 9% girls in Sweden to 36% girls in Bulgaria and 30% boys in Latvia. Duncan (1998) found evidence for a positive relation of tobacco consumption and consumption of other substances as alcohol and cannabis in children and adolescents (Duncan, 1998).

4.3 Consumption of other drugs

Illicit drug use has become a serious problem in many countries in the world. For the European Region, cannabis is the most consumed illicit drug. As can be seen in Table 4.3-1, cannabis consumption of adolescents in EU27+1 countries in 2003 vary from 3% in Romania to 44% in Czech Republic. According to the HBSC study, family affluence is not strongly associated with cannabis use in most countries. The second largest group after cannabis is inhalants and volatile substances which among other things include patrol, spray paints, some glues, laughing gas and butan. The highest value for these kinds of substances can be found in Ireland and in Cyprus with 18% and the lowest value can be found in Romania with 1% of 15 to 16 years old in 2003.

Table 4.3-1: Percentage lifetime prevalence of psychoactive substance use among students aged 15–16 years old, 2003

	Cannabis	Inhalants/volatile substances	Amphetamines	Ecstasy	LSD and other hallucinogens	Cocaine	Heroin
AT	21	14	4	3	2	2	1
BE	32	7	2	4	3	3	1
BG	21	3	2	3	2	2	1
CY	4	18	0	0	0	0	0
CZ	44	9	4	8	6	1	1
DE	27	11	5	3	3	2	1
DK	23	8	4	2	1	2	1
EE	23	8	7	5	2	1	1
ES	36	3	3	3	4	4	1
FI	11	8	1	1	1	0	1
FR	38	11	2	3	1	3	2
GR	6	15	0	2	1	1	1
HU	16	5	3	3	2	1	1
IE	39	18	1	5	2	3	1
IT	27	6	3	3	3	4	4
LT	13	5	5	2	2	1	1
LV	16	7	3	3	1	1	1
MT	10	16	1	1	1	1	1
NL	28	6	1	5	2	3	1
NO	9	5	2	2	1	1	1
PL	18	9	5	3	2	2	2
PT	15	8	3	4	2	3	2
RO	3	1	0	1	0	1	0
SE	7	8	1	2	1	1	1
SI	28	15	1	3	1	1	1
SK	25	6	3	3	2	1	1
UK	38	12	3	5	2	4	1

Source: EMCDDA European Monitoring Centre for Drugs and Drug Addiction.
Data for ES, SK: 2006. No data available for LU.
Greatest values: red; lowest values: green.

The mortality caused by illicit drugs as percentage of all deaths is about 0.4% worldwide and the DALYs as percentage of total years of life lost are about 0.8%.

The disease burden in DALYs was more than 2000 in the year 2000 in the European Region.

5 Alcohol Policy

5.1 Formulation, Implementation and Monitoring of Policy

Alcohol action plans set out what the government will do to address drinking behavior in the population and to reduce harm caused by alcohol consumption for both the community and the individual. This may include collaboration plans with police and courts regarding the adoption and abidance by the alcohol laws; information and education programs about how alcohol can affect health; dissemination of guidelines for families; adoption of age, consumption and sale restrictions; drink driving laws; strategies on alcohol withdrawal clinics and procedures; and the assessment of taxes and prices. A precondition for effective action plans is awareness of the several outcomes alcohol consumption may result in as bad health, delinquency and productivity loss.

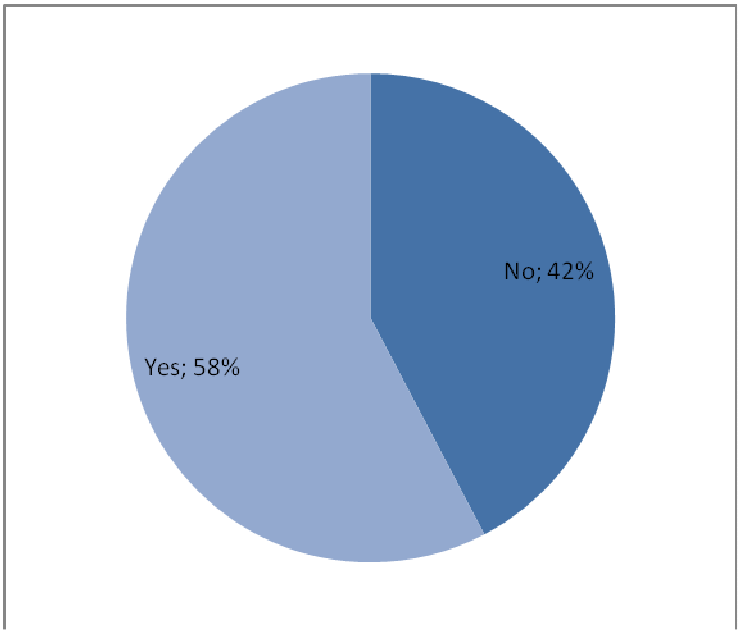
Figure 5-1: Options for alcohol action plans

A lot of recent studies could show that restrictions on the availability and the promotion of alcohol products as well as education programs and laws can have influence on the harm that can be done by alcohol consumption and on the magnitude of alcohol consumption (Engels et al. 2009; Collins et al., 2003; Cnossen, 2007; Wage-

naar et al 2008). Figure 5-1 shows some of the options for alcohol actions plans for guarding people regarding to harm that can be done by alcohol.

We analyzed the existence of national alcohol action plans in the European Union member states plus Norway except for Cyprus and Greece, where information is not available. Figure 5-2 shows that 58% of the observed countries have a national action plan on alcohol.

Figure 5-2: Existence of alcohol action plans in European Union member states

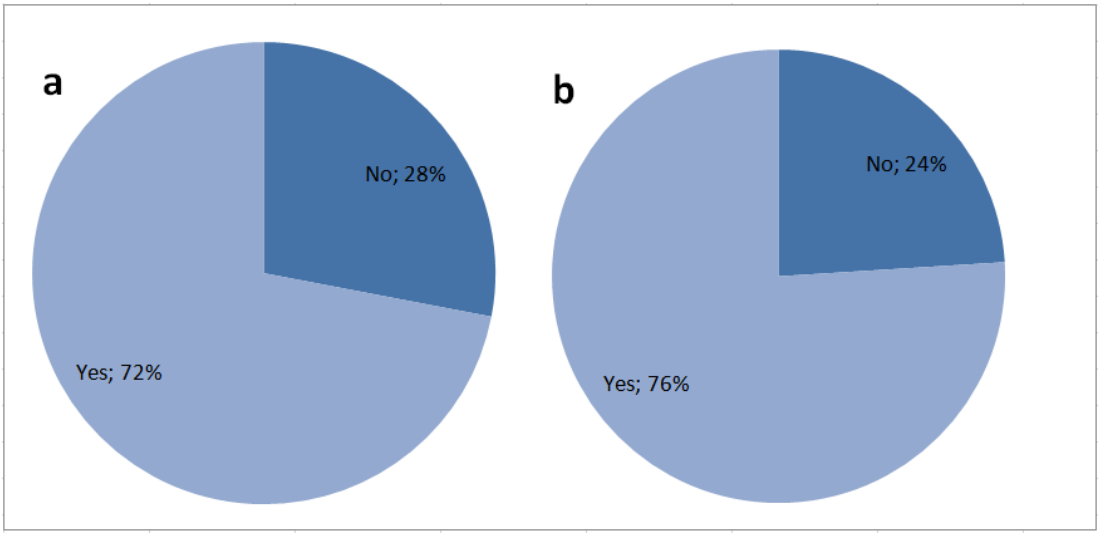


Source: WHO alcohol control database.
No information available for GR and CY.

Despite the fact that nearly 60% of the countries already have national action plan on alcohol, a share of more than 40% of countries without national alcohol action plans show, that the awareness of the necessity of prevention regarding the outcomes of alcohol consumption is still not satisfactoy.

Figure 5-3 shows that about one quarter of the countries do have regular reports on consumption, harm or policies and national surveys on alcohol consumption.

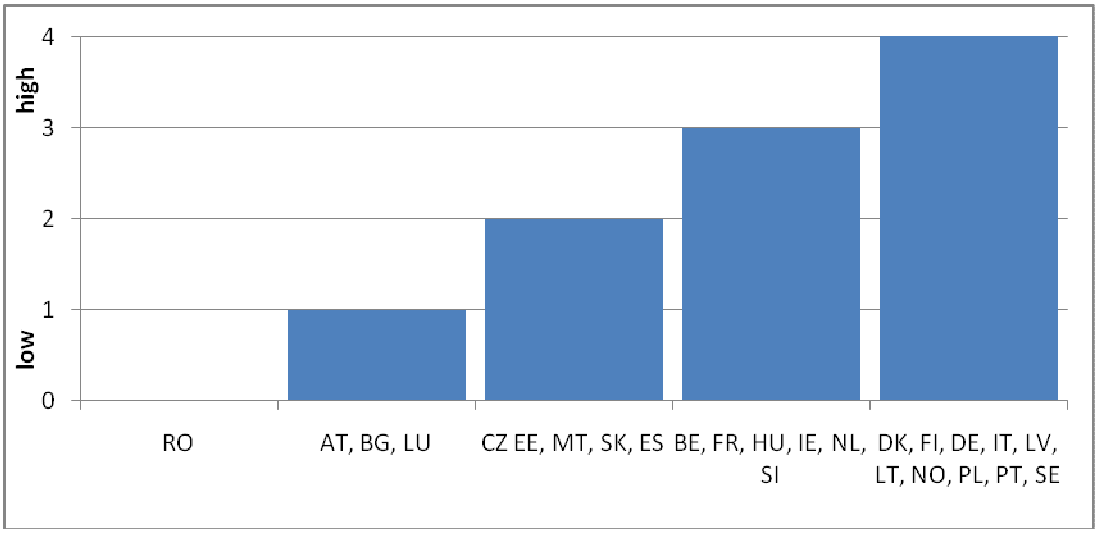
Figure 5-3: a) Regular reports on consumption, harm or policies
b) Regular national surveys on alcohol consumption



Source: WHO alcohol control database.
No information available for GR, UK and CY.

Figure 5-4 demonstrates the result of an analysis of the overall development regarding alcohol policy in the European member states. For that purpose, we comprised the existence of a national action plan on alcohol, the existence of a national coordinating body, the implementation of regular reports on consumption, harm or policies as well as of regular national surveys on alcohol consumption. For each characteristic 'does not exist' or 'does exist' a 0 or a 1 was given respectively. Thus, countries with many points have a comparatively good performance regarding implementation of alcohol policy and countries with few points have a comparatively bad performance. According to this, Romania has no countrywide implementation of alcohol policy in sense of a national action plan or countrywide analysis of harm caused by alcohol. All questions were answered with no. Austria, Bulgaria and Luxemburg have a rather bad performance regarding implementation of alcohol policy, too. On the other hand, ten countries could answer all of the former questions with yes. This analysis does not implicate evaluation. An evaluation can only be conducted in an expedient way, if targets are clearly set.

Figure 5-4: Implementation of alcohol policy, ranking



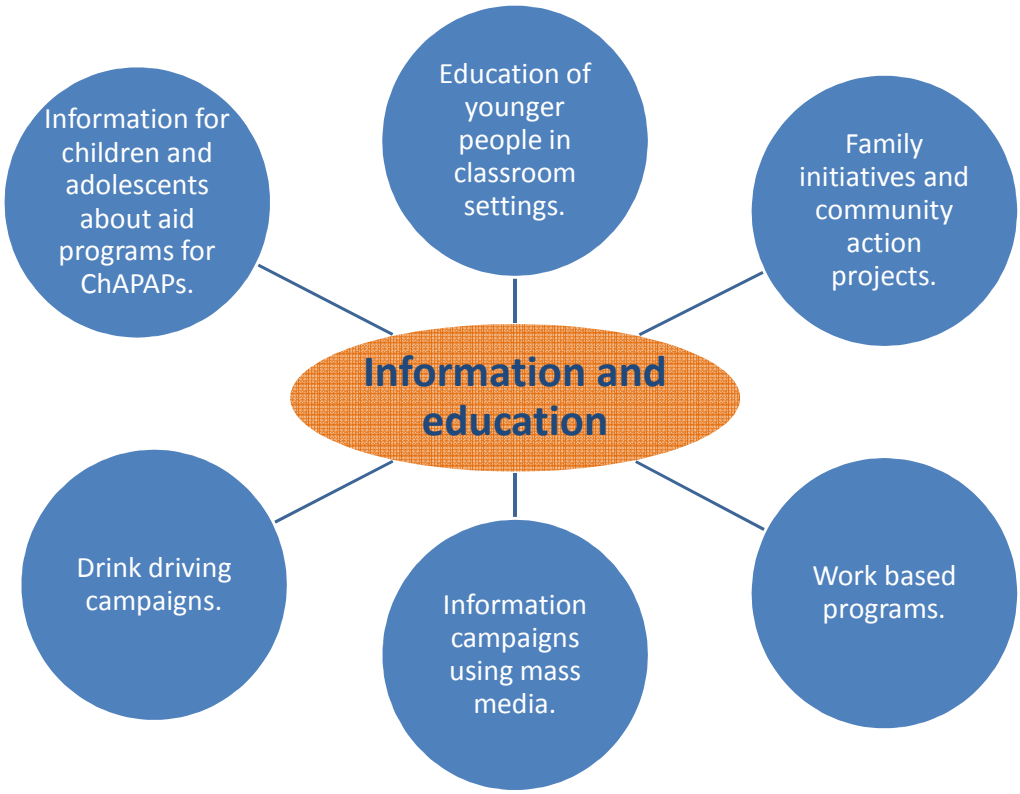
Source: WHO alcohol control database.
No information available for GR, UK and CY.

5.2 Information and Education

5.2.1 Impact of information and education programs

Information and education programs are considered as a main starting point for prevention activities. A variety of approaches is available regarding information and education programs with the aim of lowering harm done by alcohol. Figure 5-5 gives an overview of information programs.

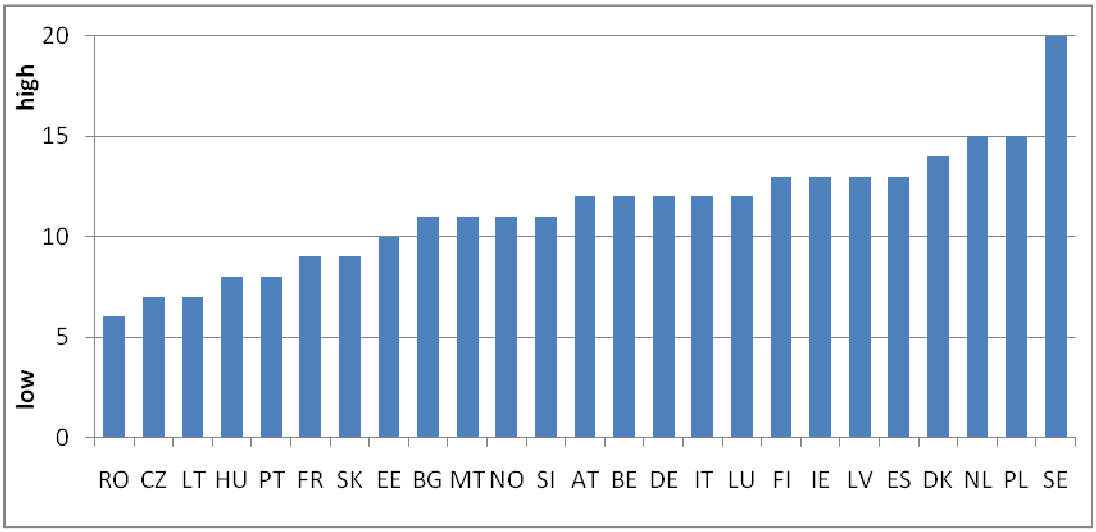
Figure 5-5: Options for information and education programs



The high popularity of information programs is caused by the rising awareness of harm done by alcohol, which again results from the rising number of studies about consequences of alcohol regarding health, crime and productivity loss. On the other hand, very few evidence could yet be found about the impact of information programs. Thus, for example, a lot of studies and systematic reviews about school-based education could not find any effectiveness of interventions with the aim to reduce alcohol related harm (Hunter et al, 2004; Foxcroft et al, 1997, Foxcroft et al, 2003). A study from Giesbrecht (2007) examined recent studies on the global burden of alcohol. A synopsis of main findings from reviews and other analysis couldn't provide evidence of the effectiveness of education and persuasion interventions.

5.2.2 Development of alcohol-related information and education

Figure 5-6: Development of alcohol-related information and education, ranking



Source: WHO alcohol control database, own computation.
No data available for UK, CY, GR.
FI: drink driving was not evaluated. 3 points were given by author.

Figure 5-6 shows a ranking of the development status of alcohol information and education. The rating of development status is based upon opinions of alcohol policy experts in the respective country and thus is not comparable on a scientifically unassailable level. Anyway, we use the data for an approximate estimation of development level of alcohol related information, since a comparison of the statements of the WHO experts is largely consistent with the statements in the country reports of Harwin et al (2009). Different programs evaluated the information and education status. These involved mass media programs, school based programs, work based programs, local communities programs and drink driving campaigns. Categories were assessed as highly developed, moderately developed, developed, poorly developed, and does not exist. A number was assigned to each category from 4 which mean 'highly developed' to 0 which means 'does not exist'. According to that, countries with high numbers are described to be good developed regarding alcohol related information and education. Good performance can be observed in Sweden, Netherlands and Poland. Bad performance regarding the development of alcohol related information and education can be observed in Czech Republic, Lithuania and Romania. Among all countries, drink driving programs and school-based programs were rated best. Relatively bad performance was estimated regarding work place programs and mass media campaigns.

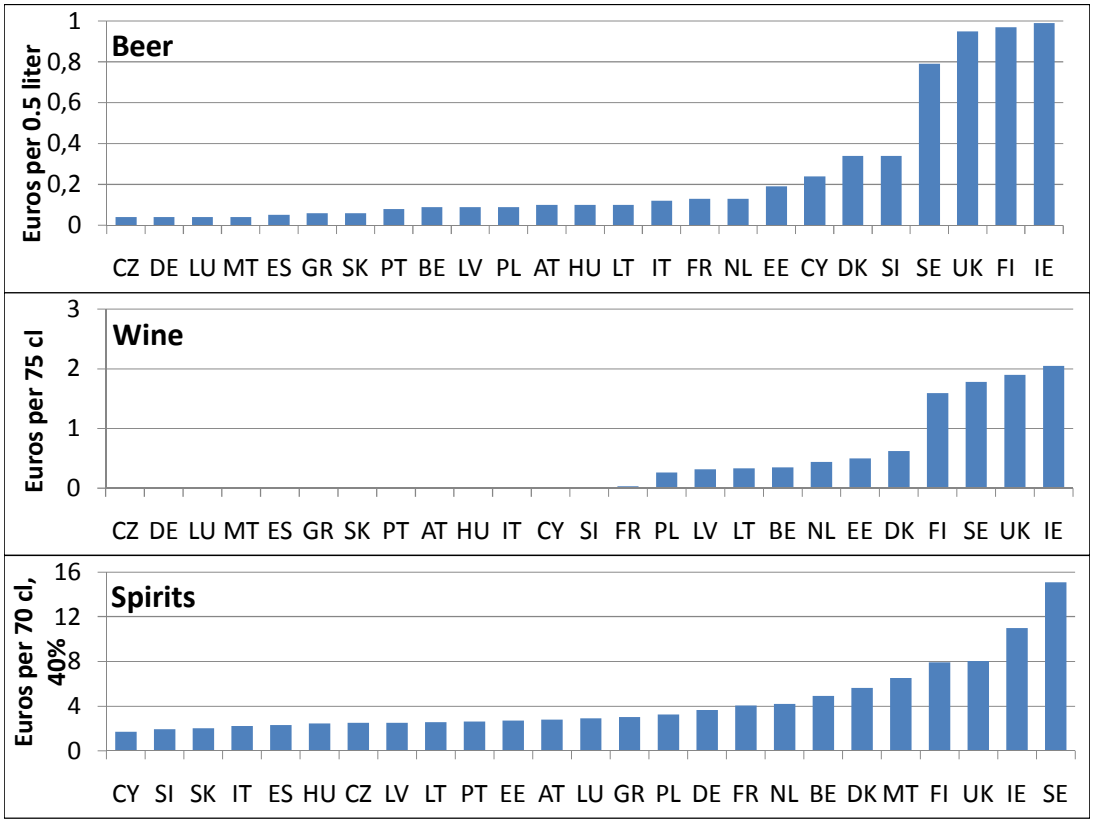
5.3 Availability of Alcohol Products, market restrictions

5.3.1 Amount of taxes on alcoholic drinks

Taxes on alcohol do not only aim on revenues for the state but are also seen as a prevention strategy and health policy intervention. The purpose is to reduce the amount of alcohol consumption and thus decrease the incidence of diseases related to alcohol as well as crime and productivity loss. This aim is furthermore to be achieved through limitation policy, laws as drink driving and restrictions on advertising. A recent systematic review on the relationship between measures of beverage alcohol tax or price levels and alcohol sales or self- reported drinking provided evidence that a significant inverse relation exists (Wagenaar 2009). The meta-analysis examined 112 studies. Results demonstrate a statistical evidence of effects of alcohol prices on drinking. This includes all alcoholic beverages and all types of drinkers from light drinkers to heavy drinkers. From this it follows that taxes have preventive character concerning alcohol consumption and hence harm that is done by alcohol consumption.

Excise duties on alcohol differ widely among the European Union member states, although harmonization of excise duties is aspired. Figure 5-7 gives an overview of the alcohol excise duties for beer, wine and spirits in European Union. Excise duties for beer range from 0.04 Euros per 0.5 liter beer in Czech Republic, Germany, Luxemburg and Malta to 0.99 Euro in Ireland. The average in EU 25 is 0.25 Euros per 0.5 liter beer, 0.41 Euros per 75cl wine and 4.35 Euros per 70cl spirits with 40 Vol%. It is worth mentioning that excise duties for each kind of alcoholic beverage are considerably lower in EU10 than in EU15.

Figure 5-7: Alcohol excise duties for beer wine and spirits in the European Union

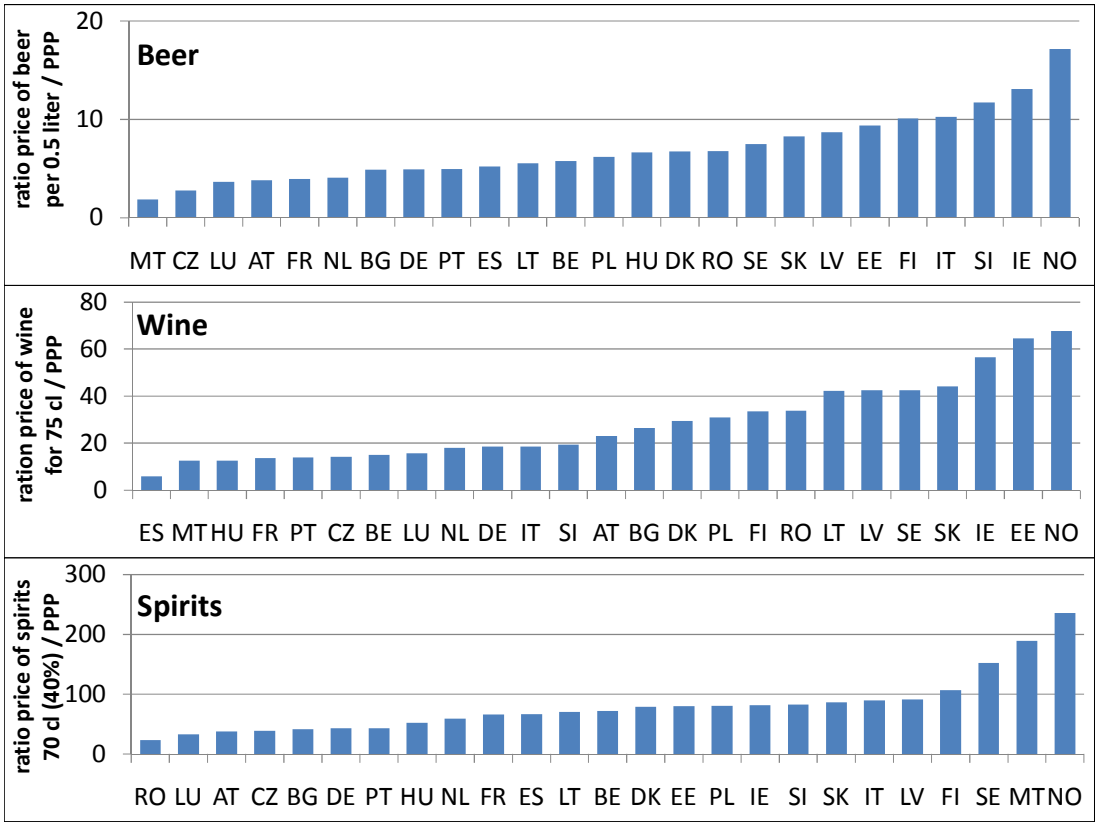


Source: European Commission, Excise duty tables, July 2006.
No Data available for BG, NO, RO.

5.3.2 Price-income-ratio of alcohol products

Prices of alcoholic beverages differ widely among EU 27+1. To make data comparable, prices of alcoholic beverages have to be related to available income of the population. We used prices of beer, wine and spirits as indicated on WHO alcohol control database and related them to purchasing power parities per capita per year in each country. For this, we divided prices for beer, wine and spirits by PPP per capita and multiplied the result by 100. Figure 5-8 shows the relation of prices of alcoholic beverages in Euros and PPP per capita. For each kind of alcoholic beverage, Norway has the largest ratios, thus, alcoholic beverages are most expensive there if controlled for available income.

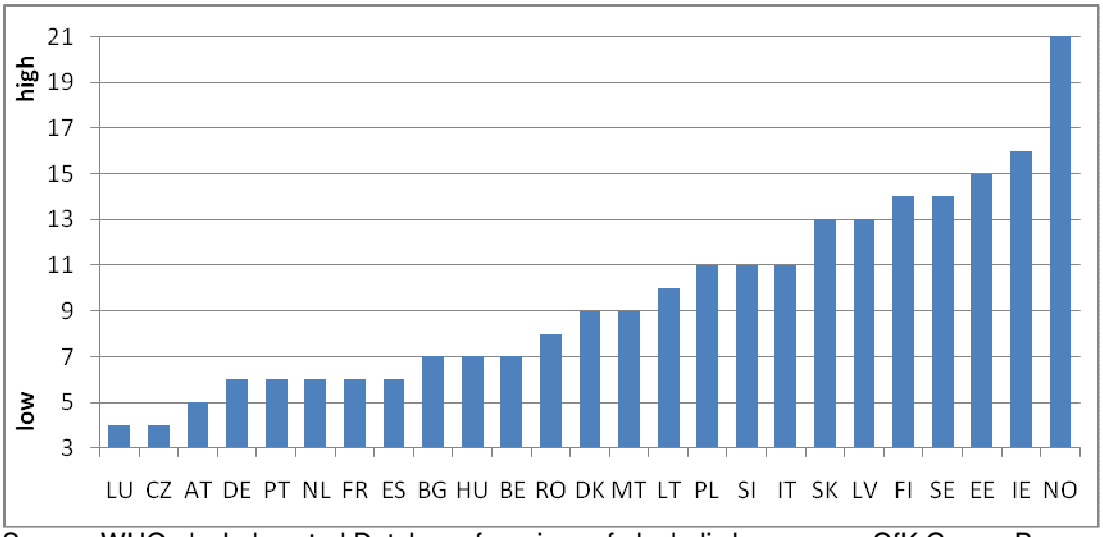
Figure 5-8: Relation of prices of alcoholic beverages in Euros and PPP per capita



Source: WHO alcohol control Database for prices of alcoholic beverages; GfK Group: Purchasing power in Europe (2005).
No data available for CY, UK, GR.

In Figure 5-9, countries are ranked concerning prices for all alcoholic beverages. We again controlled for available income. Beside sales and consumption restrictions, prices are an indicator for access to alcoholic products. We ranked each price-income-ratio for wine, beer and spirits with numbers from 1 to 7. 7 points stands for a high price-income-ratio and 1 point stand for a low ratio. Since Norway has highest price-income-ratio for each alcoholic beverage observed, it is the country with highest overall price-income-ratio in the considered countries. Ireland, Estonia, Sweden and Finland have high price-income-ratios, too. Lowest price/ income ratios can be observed in Luxemburg, Czech Republic and Austria.

Figure 5-9: Prices of alcoholic beverages in relation to PPP, ranking



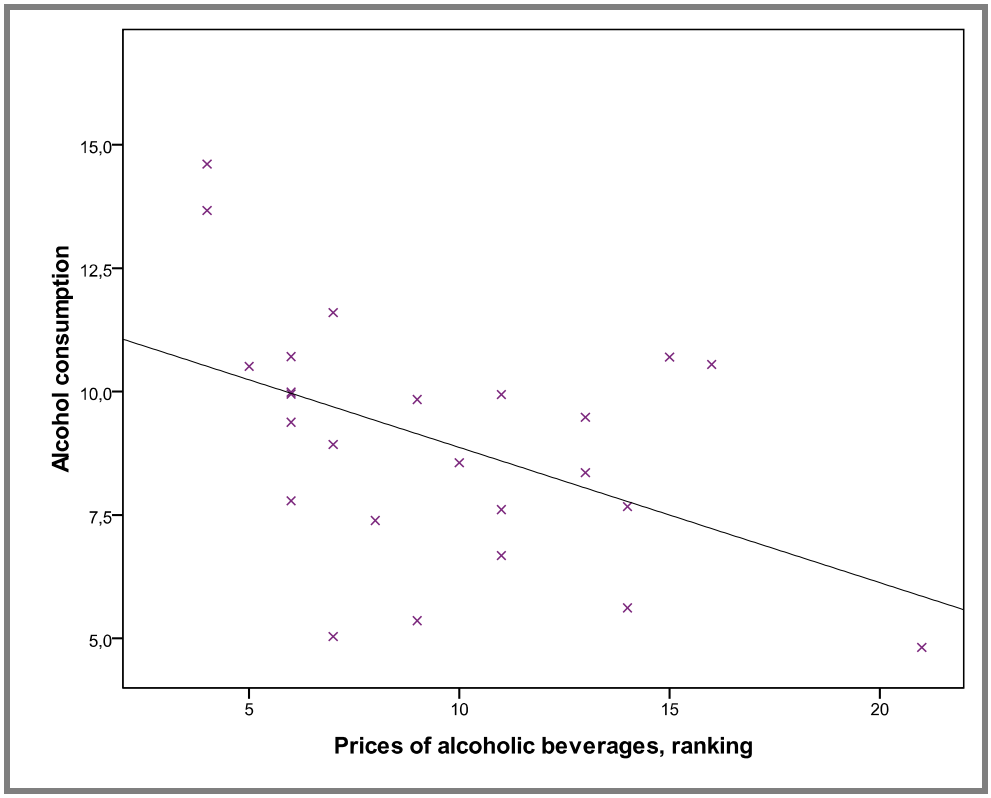
Source: WHO alcohol control Database for prices of alcoholic beverages; GfK Group: Purchasing power in Europe (2005).
No data available for CY, UK, GR.

We analyzed if and how much prices of alcoholic beverages in relation to PPP in EU 27+1 have an influence on alcohol consumption in pure liters per person per capita (for alcohol consumption in pure liters of alcohol per person per year compare chapter 4.1). Table 5.3-1 shows the results of the regression of prices of alcoholic beverages in relation to PPP on alcohol consumption. The regression coefficient β=-0.274 shows that if the prices of alcoholic beverages increase by 1 unit (ranking) the alcohol consumption decreases by 0.274 liters per capita.

Table 5.3-1: Results of regression of prices of alcoholic beverages in relation to PPP on alcohol consumption

Pearson's correlation coefficient	p-value	Regression coefficient β	R^2
-0.476	0.016	-0.274	0.226

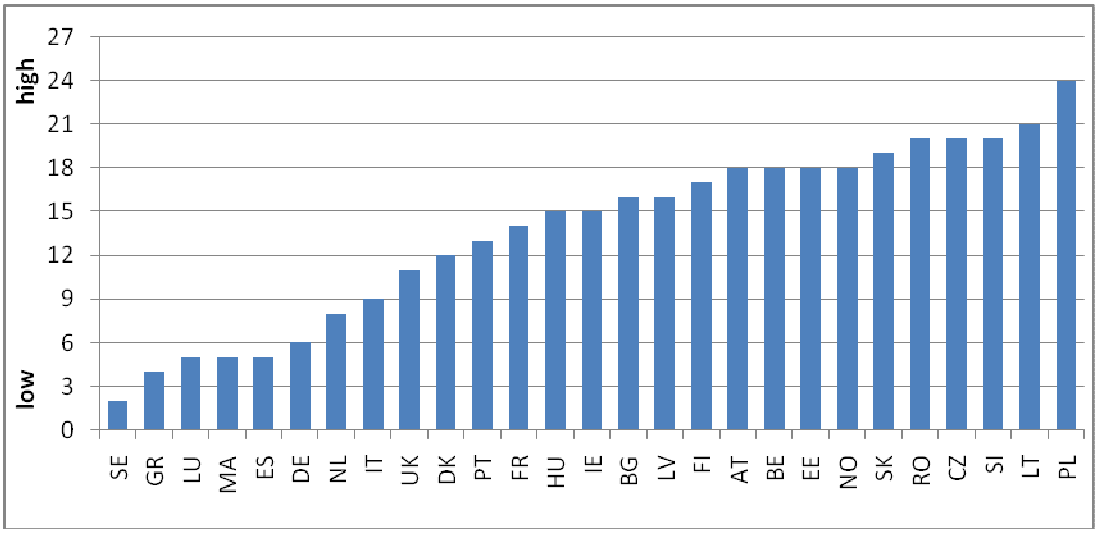
Figure 5-10: Regression of prices of alcoholic beverages in relation to PPP on alcohol consumption



5.3.3 Restriction on alcohol consumption on places

In Figure 5-11 a ranking of magnitude of legal restrictions on alcohol was developed. Therefore, data from WHO alcohol control database was used, which defines an alcohol restriction level for several places. Places involve health care buildings, educational buildings, government buildings, public transport, restaurants, parks and streets, sporting events, leisure events and workplaces. Restriction levels were classified in complete restriction, partial restriction, no restriction, and voluntary agreements. In order to rank the overall restriction level on alcohol among the European Union member states, numbers were assigned to each restriction level. Complete restriction was weighted with 3, partial restriction with 2, voluntary agreements with 1 and no restrictions with 0 such that the countries with highest restrictions on alcohol consumptions have the highest numbers. On this evidence, Poland, Lithuania and Czech Republic show highest alcohol restrictions whereas Luxemburg, Malta, Greece and Sweden have few restrictions on alcohol consumption. Among all countries, best rankings were found for educational buildings, health care buildings, public transport, sporting events and workplaces. Low consumption restrictions were observed in restaurants, on leisure events and in government buildings.

Figure 5-11: legal restrictions on consumption of alcohol, ranking

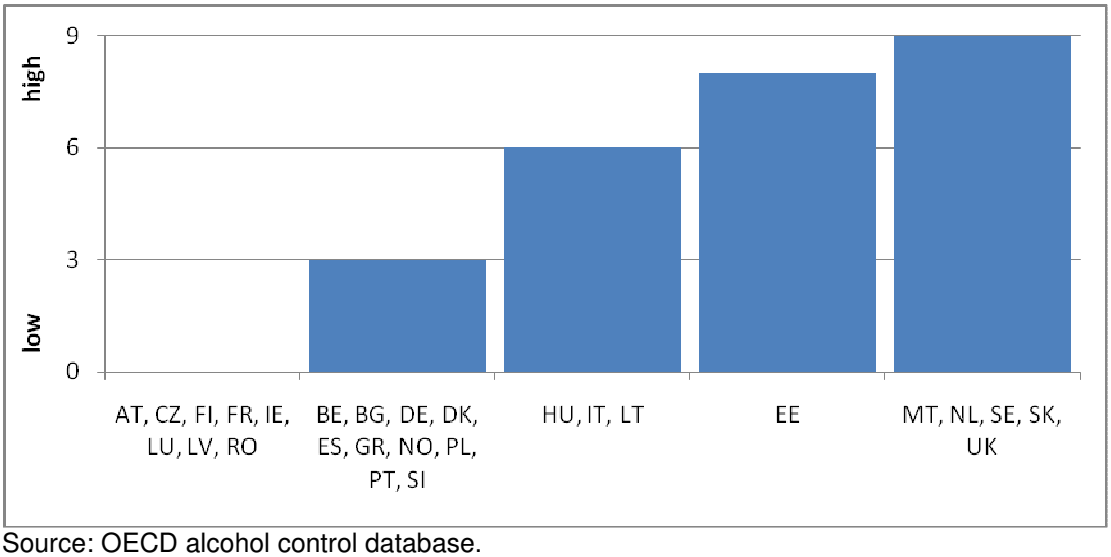


Source: WHO, alcohol control database. Own computation.
No data available for CY.

5.3.4 Limitations in hours or days of sale

The European Union member countries feature different levels of sales restriction regarding hours and days of sale. Australia, Czech Republic, Finland, France, Ireland, Luxemburg, Latvia and Romania have no hours and days restrictions and no place restrictions on sale at all. United Kingdom, Sweden, Spain, Norway and Netherlands have hours and days restrictions on each kind of alcoholic beverage: beer, wine and spirits. Finland has restrictions on hours and days of sale for each kind of beverage except for day restriction on beer. Malta, Netherlands, Sweden, Slovakia and UK have restrictions on hours and days for each kind of alcoholic beverage and restrictions on places were alcoholic beverages may be sold. We awarded a 1 for restrictions in hours and days of sale for each, beer, wine and spirits as well as for the existence of place restrictions regarding alcohol sales for each alcoholic beverage. Zero points were given if no sales restrictions are in force. Thus, countries with high numbers have most restrictions on alcohol sales and countries with a low score have few or no restrictions on alcohol sales. Figure 5-12 shows a ranking of the strength of alcohol sales in EU 27+1.

Figure 5-12: Legal sale restrictions by hours, days and places, ranked



Source: OECD alcohol control database.
No data available for CY.

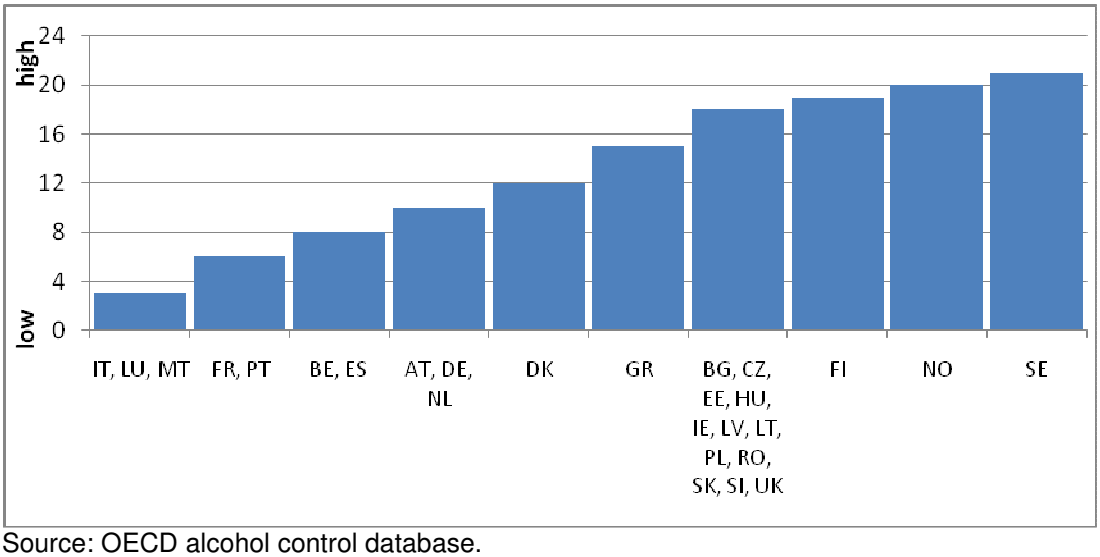
Most of the recent studies regarding the impact of restrictions in alcohol sales on alcohol consumption show evidence for a significant negative relationship (Chikritzhs et al, 2006). That means that with increasing restrictions on alcohol sales, alcohol consumption and harm done by alcohol decreases.

5.3.5 Age restrictions

Alcohol consumption is also restricted regarding age. Each country in EU 27+1 have a kind of age restriction on alcohol. We analyzed age restrictions in bars and shops for each kind of alcoholic beverage. Luxemburg, Malta and Italy have no age restrictions for buying alcoholic beverages in shops. Belgium has only a restriction for buying spirits in shops. Each country has age restrictions in bars. In Scandinavian countries, age restrictions partly are in force until the age of 20.

Figure 5-13 shows the ranked strength of age restrictions for buying alcoholic beverages. Parameters under control are limitations of alcohol sales for young people in bars and in shops. Beer, wine and spirits are separately examined. 4 points were assessed for each country with age restrictions until the age of 20 years. 3 points were assessed until the age of 18 years, 2 for 17 years, 1 for 16 years and 0 for no age restriction. On this evidence, Sweden, Norway and Finland have the most restrictive age limitations in EU 27+1. Italy, Luxemburg and Malta have the least restrictive age limitations.

Figure 5-13: Legal sale restrictions by age, ranked

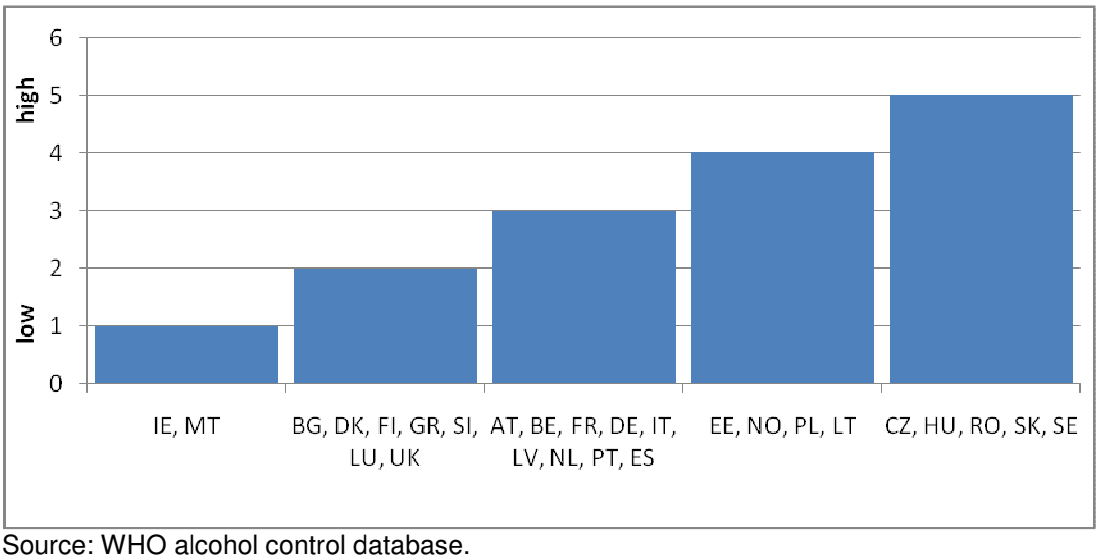


Source: OECD alcohol control database.
No data available for CY.

There is strong evidence, especially in US, that minimum age for legal consumption of alcohol is an effective measure for reducing alcohol related harm among young people. A review from Wagenaar et al (2002) shows that a minimum legal drinking age significantly reduces alcohol consumption and traffic crashes. The same results are demonstrated in Ponicki et al (2007).

5.4 Drink driving

Figure 5-14: Drink driving laws, ranked



Source: WHO alcohol control database.
No data available for CY.

Figure 5-14 shows a ranking of drink driving laws in EU 27+1 accept for Cyprus, were data was not available. The ranking involves the parameters legal blood alcohol concentration and the existence of mandatory driver education or treatment pro-

grams for habitual offenders. Legal blood concentrations range from 0 to 0.08 mg/ml BAC. We assigned a 5 for BAC of 0, which is existent in Czech Republic, Hungary, Romania and Slovakia. 4 points were assigned for a BAC of 0.02, 3 points for a BAC of 0.04, 2 points for 0.05 and 1 point for 0.08 BAC. Only Ireland, Malta, UK and Luxemburg still have BAC values of 0.08. For mandatory driver education programs for habitual offenders, a 1 was given in case of existence and a 0 if these kinds of programs do not exist. Best values, in sense of intense drink driving laws, can thus be observed in Sweden and in Czech Republic, Hungary, Romania, Slovakia and Lithuania, whereas Ireland and Malta have poor performance regarding drink driving laws.

As we already pointed out in chapter 2.3, alcohol accounts for a significant proportion of road traffic injuries and accidents. In 25% of all fatal road accidents alcohol was involved. For this reason, the European Union recommended drink-driving laws, which allow for not more than 0.05mg/ml for all drivers and 0.02mg/ml for novice drivers. In the course of strengthened drink driving laws, road traffic deaths caused by alcohol could be reduced in EU member countries in the last decade (ETSC, 2008). A study from Fell et al (2005) observed studies, which analyzed the lowering of BAC limit from 0.08 to 0.05. According to that, the lowering of BAC level led to a 5-16% reduction in crashes, fatalities and injuries. Another study from Desapriya et al (2007) analyzed the number of alcohol-impaired drivers and alcohol-involved motor vehicle crashes in Japan after lowering the BAC from 0.05 mg/ml to 0.03 mg/ml. According to this study, the introduction of reduced BAC limit legislation resulted in a statistically significant decrease in the number of alcohol-impaired drivers and was associated with statistically significant reductions in alcohol-involved motor vehicle crashes.

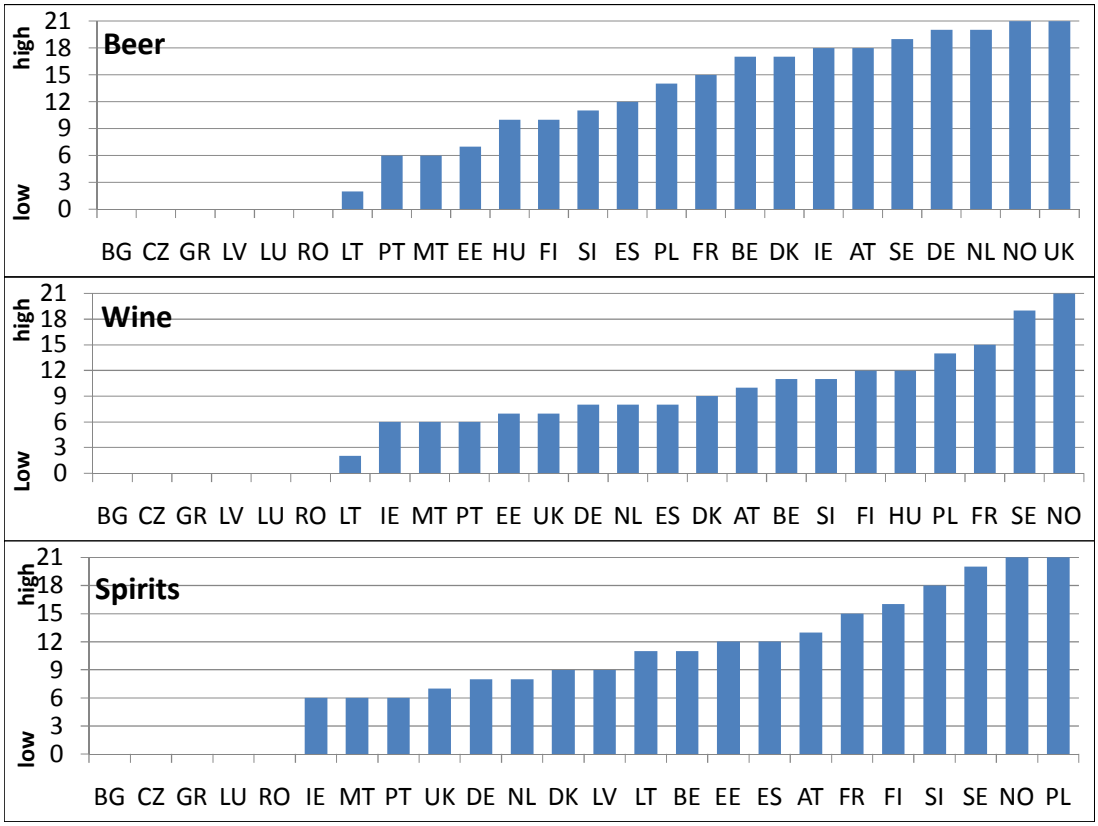
5.5 Promotion of Alcohol Products

Advertising can be distinguished in direct advertising via television, radio and print media and in indirect advertising such as sponsorship and product placement. Alcohol products are often promoted as lifestyle products by using young people in commercials, “cool” graphics, such as comic style or popular music and bands. This runs the risk, that the promoted products are especially interesting for young people. Many recent studies could provide evidence for significant higher consumption due to alcohol advertisement especially in adolescents (Science Group of the European Alcohol and Health Forum, 2009). For example, Austin et al. (2006) showed that alcohol advertisement leads to an increased positive expectance in alcohol con-

sumption in young people. At the same time, positive expectancies trigger higher alcohol consumption as could be shown by Chen and Grube (2002). A systematic review of longitudinal studies by Anderson et al (2009) found out that alcohol advertising and promotion increases the likelihood that adolescents will start to use alcohol, and to drink more if they are already using alcohol. For this reason, many countries implemented restrictions on advertising as well as sponsorship and brand identification. A recent article by Nicholson et al (2009) concentrates especially on televised sports in US, since 9 of 10 interviewed children aged 8 to 17 years view or hear sports media and 88% of the surveyed children and adolescents reported watching sports on TV. Additionally, sport television is often used for alcohol advertisement such that children and adolescents can be assumed to see a high amount of alcohol advertisement.

Figure shows the magnitude of restrictions on advertising, sponsorship or brand identification for beer, wine and spirits. Seven possibilities for restrictions were being observed: restrictions on national TV, cable TV, national radio, printed newspapers and magazines, billboards, point of sales, and cinema. For each characteristic concerning restrictions ‘complete restriction’, ‘partial restriction’, ‘voluntary agreement’ and ‘no restriction’ 3, 2, 1 or 0 points were given respectively. As can be seen in Figure 5-15, Belgium, Czech Republic and Greece have the fewest restrictions on advertising, sponsorship or brand identification in the regarded countries. Norway and Sweden have rather tight restriction laws for each alcoholic beverage, beer, wine and spirits.

Figure 5-15: Restrictions on advertising, sponsorship or brand identification for beer, wine and spirits



Source: WHO alcohol control database.
No data available for CY, SK and IT.

6 Results

6.1 Determining factors that influence alcohol drinking of 15-year-olds

To measure the influence of the health and social factors for children and adolescents, we determined, which parameters influence the percentage of 15-year-olds who drink at least once a week in EU27+1. For this purpose, we made two regressions with the variable 15-year-olds who drink at least once a week as dependent variable. Model 1, the health factors model, measures the impact of following independent variables on the percentage of 15-year-olds who drink at least once a week:

a. Percentage of 15-year-olds who rate their health as fair or poor (HEALTH)
b. Percentage of 15-year-olds who report that they are overweight or obese according to BMI (OVERWEIGHT)
c. Suicides among 15 to 19 years old per 100 000 inhabitants (SUICIDE)
d. Percentage of 15-year-olds who smoke at last once a week (SMOKE)
e. Percentage of lifetime prevalence of cannabis among students aged 15-16 (CANNABIS)

Model 2, the social factors model, measures the impact of following independent variables on the percentage of 15-year-olds who drink at least once a week:

a. Percentage of children living in households below 60% of contemporary national median income (POVERTY)
b. Development of alcohol-related information and education, ranking (EDUCATION)
c. Legal sale restrictions by age, ranked (SALE_AGE)
d. Legal sale restrictions by hours, days and places, ranked (SALE_HOUR)
e. Restrictions on advertising, sponsorship or brand identification for beer, wine and spirits, ranked and summed (RESTRICT_M)
f. Legal restrictions on consumption of alcohol, ranking (RESTRICT_C)

The p-values in TableTable 13-1 show that the variables HEALTH, SUICIDE and SMOKE do have a significant influence on the percentage of 15-year-olds who drink at last once a week (<0,05 on a 95% confidence interval).

Table 13-1: Results of regression model 1: Health factors

Variable	Regression coefficient	Standardized regression coefficient	p-value
HEALTH	0.672	0.356	**0.037**
OVERWEIGHT	0.393	0.190	0.253
SUICIDE	-1.514	-0.488	**0.016**
SMOKE	1.164	0.595	**0.001**
CANNABIS	0.170	0.192	0.235
R^2=0.588			

The standardized regression coefficients specify the magnitude of the influence of the independent variable. The variable SMOKE has the greatest influence (0.595) followed by SUICIDE (-0.488) and HEALTH (0.356). A regression coefficient of 0.672 for HEALTH means that if the percentage of 15-year-olds who rate their health as fair or poor increases about 10 percentage points, the percentage of 15-year-olds who drink at last once a week increases about 6.72 percentage points (HEALTH +10pp -> ALCOHOL +6.72pp). When there is 1 suicide more among 15 to 19 years old per 100 000 inhabitants the percentage of 15-year-olds who drink at last once a week decreases about 1.51 percentage points (SUICIDE +1 -> ALCOHOL -1.51pp). A 10-percentage point increase of the 15-year-olds who smoke at last once a week results in a 11.64-percentage point increase of 15-year-olds who drink at last once a week (SMOKE +10pp -> ALCOHOL +11.64pp). The coefficient of determination R^2 shows that 58.8% of the variation in the data could be explained by the chosen independent variables.

The p-values in Table 13-2 show that the variables SALE_AGE and RESTRICT_M have a significant influence on the percentage of 15-year-olds who drink at last once a week. The variable RESTRICT_M has the greatest influence with a regression coefficient of -0.766 followed by SALE_AGE with a regression coefficient of -0.685. A regression coefficient of -1.151 for SALE_AGE means, that if the legal sale restrictions by age increase by 1 point, the percentage of 15-year-olds who drink at last once a week decreases about 1.151 percentage points (SALE_AGE +1p -> ALCOHOL -1.151pp). If the marketing restrictions increase by 1 point, the percentage of 15-year-olds who drink at last once a week decreases about 0.407 percentage points. R^2 shows that 48.6% of the variation in the data could be explained by the chosen independent variables.

Table 13-2: Results of regression model 1: Social factors

Variable	Regression coefficient	Standardized regression coefficient	p-value
POVERTY	-0.639	-0.313	0.174
EDUCATION	1.413	0.442	0.163
SALE_AGE	-1.151	-0.685	**0.020**
SALE_HOUR	1.317	0.420	0.072
RESTRICT_M	-0.407	-0.766	**0.012**
RESTRICT_C	0.868	0.545	0.107
R^2=0.486			

According to these results, alcohol consumption in adolescents depends on social factors as legal sale restrictions by age and marketing restrictions. A positive effect of alcohol policy, including restrictions on sales, age, marketing and legislation, also inures to the benefit of children by preventing their parents to drink. However, it is important to mention that many other factors contribute to alcohol consumption, e.g. relations to the peer group, psychological and biological factors. Considering positive evidence of alcohol policy on the prevalence of alcohol dependencies, alcohol policy should be understood as a primary prevention strategy for negative health outcomes in ChAPAPs.

Anderson P, Baumberg B (2006). Alcohol in Europe - a public health perspective. A report for the European Commission. Institute of alcohol studies, UK.

Anderson P, de Bruijn A, Angus K, Gordon R, Hastings G. Impact of alcohol advertising and media exposure on adolescent alcohol use: a systematic review of longitudinal studies [published online January 14, 2009]. Alcohol and Alcoholism.

Arnrup K, Berggren U, Broberg A G, Lundin Sven-Åke, Hakeberg M (2002). Attitudes to dental care among parents of uncooperative vs. cooperative child dental patients. European Journal of Oral Sciences. Apr;110(2):75-82.

Association of Public Health Observatories (2007). Indications 5: Child Health. APHO Indications Series: Indications of pulic health in the English regions.

Austin EW, Chen M-J, Grube JW (2006). How does alcohol advertising influence underage drinking? The role of desirability, identification and skepticism. Journal of Adolescent Health; 38: 376–384.

Bagust A, Place M, Posnett JW (1999). Dynamics of bed use in accommodating emergency admissions: stochastic simulation model. BMJ; 319:155–158.

Behaviour and Attitudes (2009). Keeping it in the Family Survey: Parental Drinking among 18-40 Year Olds, Prevalence and Impact. Dublin: Alcohol Action Ireland.

Brownell MD, Roos NP, Burchill C (1999). Monitoring the impact of hospital downsizing on access to care and quality of care. Medical Care, 37(6):135–150.

Case A, Fertig A, Paxson C (2003). The Effect of Income on Child Health: Evidence from the British Cohort Study. Discussion paper, American Economic Association meetings, Washington, DC.

Centers for Disease Control and Prevention (CDC) (2006). Fetal Alcohol Spectrum Disorders. Date of access 15 February 2009: http://www.cdc.gov/ncbddd/FAS/fasask.htm 20.01.2009.

Chandy JM, Harris L, Blum RW, Resnick MD (1995). Female adolescents of alcohol misusers: Disordered eating features. Interantional Jounral of Eating Disorders;17(3):283-289.

Chen M-J, Grube JW. (2002). TV beer and soft drink advertising: what young people like and what effects? Alcohol Clin Exp Res; 26(6):900– 6.

Chick J, Kemppainen E (2007). Estimating Alcohol Consumption. Pancreatology; 7: 157–161.

Chikritzhs T, Gray D, Lyons Z, Saggers S (2007). Restrictions on the Sale and Supply of Alcohol: Evidence and Outcomes. Perth: National Drug Research Institute, Curtin University of Technology.

Chikritzhs T, Stockwell T (2006). The impact of later trading hours for hotels on levels of impaired driver road crashes and driver breath alcohol levels Addiction; 101(9): 1254–1264.

Christoffersen M N, Soothill K (2003). The long-term consequences of parental alcohol abuse: a cohort study of children in Denmark. Journal of Substance Abuse Treatment; 25(2): 107-116.

Cnossen S (2007). Alcohol taxation and regulation in the European Union. Int Tay Public Finance; 14: 699-732.

Collins RL, Schell T, Ellickson PL, McCaffrey D (2003). Predictors of beer advertising awareness among eighth graders. Addiction; 98(9):1297-306.

Courtois R, Caudrelier N, Legay E, Lalande G, Halimi A, Jonas Carol (2007). Influence of parental tobacco dependence and parenting styles on adolescents' tobacco use. Presse médicale; 36(10,1): 1341-1349.

Curie J (2008). Healthy, wealthy and wise: Socioeconomic Status, Poor Health in Childhood, and Human Capital Development. NBER Working Paper No. 13987, Massachusetts.

Currie J, Stabile M (2003). Socioeconomic Status and Child Health: Why Is the Relationship Stronger for Older Children? The American Economic Review; 93(5):1813-1823.

Desapriya E, Shimizu S, Pike I, Subzwari S, Scime G (2007). Impact of lowering the legal blood alcohol concentration limit to 0.03 on male, female and teenage drivers involved alcohol-related crashes in Japan. Int J Inj Contr Saf Promot; 14(3): 181-187.

Deutsche Hauptstelle für Suchtfragen e.V. (DHS) (2008). Binge Drinking and Europe. Hamm.

Duncan SC, Duncan TE, Hops H (1998). Progression of alcohol, cigarette and marijuana use in adolescence. Journal of behavioural medicine; 21(4):375-388.

Elgar FJ, Roberts C, Parry-Langdon N, Boyce W (2005). Income inequality and alcohol use: a multilevel analysis of drinking and drunkenness in adolescents in 34 countries. European Journal of Public Health; 15(3):245-250.

Elkind MSV, Sciacca R, Boden-Albala B, Rundek T, Paik MC, Sacco RL (2006). Moderate Alcohol Consumption Reduces Risk of Ischemic Stroke. The Northern Manhattan Study. Stroke; 37: 13-19.

Emerson E (2009). Relative Child Poverty, Income Inequality, Wealth, and Health, JAMA, 301(4): 425-426.

Engels, RCME, Hermans R, van Baaren RB, Hollenstein T, Bot SM (2009). Alcohol Portrayal on Television Affects Actual Drinking Behaviour. Alcohol & Alcoholism; 44(1); 1-9.

Eurocare and Coface (1998). Problems in the Family: A report to the European Union.

European Commission (2006a). Alcohol-related harm in Europe- Key data. Factsheet: Health & Consumer Protection Directorate General. European Commission, Brussels.

European Transport Safety Council (ETSC) (2008). Drink driving fact sheet. Date of access: 20.February 2009. http://www.etsc.eu/documents/Fact_Sheet_DD.pdf

European Transport Safety Council (ETSC) (2008). Drink driving in the EU and road traffic law enforcement. ETSC Fact Sheet.

Eurostat (2005 a). Population projections. Date of access: 26 March 2008: http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=caa11024.

Eurostat (2006 a). Population Statistics, Detailed Tables. Luxembourg: Office for Official Publications of the European Communities.

Eurostat (2007a). Key figures on Europe 2007/08.

Eurostat (2008a). Total population - At 1 January. February 22, 2008; The inhabitants of a given area on 1 January of the year in question. Available at: Date of access 03 October 2008:http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&language=en&pcode=caa10000&tableSelection=1&footnotes=yes&labeling=labels&plugin=1.

Eurostat (2008b). Real GDP growth rate. Date of access: 1 April 2008; http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=eb012.

Eurostat (2008c). ILC_DI12 = Gini-Koeffizient. Date of access: 14 Jul 2008. http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1073,46870091&_dad=portal&_schema=PORTAL&p_product_code=ILC_DI12

Fell JC, Voas RB (2005). The effectiveness of reducing illegal blood alcohol concentration (BAC) limits for driving: Evidence for lowering the limit to .05 BAC. Journal of Safety Research; 37 (3): 233-243.

Foxcroft DR, Ireland D, Lister-Sharp DJ, Lowe G, Breen R (2003). Longer-term primary prevention for alcohol misuse in young people: a systematic review. Addiction; 98(4): 397-411.

Foxcroft DR, Lister-Sharp D, Lowe G (1997). Alcohol misuse prevention for young people: a systematic review reveals methodological concerns and lack of reliable evidence of effectiveness. Addiction; 92(5): 531-537.

GfK (2005). Studie zu Kaufkraft in Europa - arm und reich eng nebeneinander. Press release. Date of access 23 Mach 2009: http://www.umfragen.info/online/umfrage/2005/gfk-studie-zu-kaufkraft-in-europa-arm-und-reich-eng-nebeneinander/.

Giesbrecht N (2007). Reducing alcohol-related damage in populations: rethinking the roles of education and persuasion interventions. Addiction; 102: 1345-1349.

Gillcrist JA, Brumley DE, Blackford JU (2001). Community socioeconomic status and children's dental health. J Am Dent Assoc; 132(2):216-222.

Häggman-Laitila ARN, Euramaa K-I (2003). Finnish Families' Need for Special Support as Evaluated by Public Health Nurses Working in Maternity and Child Welfare Clinics. Public Health Nursing; 20(4): 328–338.

Hanratty B, Robinson M (1999). Coping with winter bed crises. BMJ; 319:1511–1512.

Harwin J, Madge N, Heath S (2009). Children Affected by Parental Alcohol Problems (ChAPAPs) - A report on research, policy, practice and service development in relation to ChAPAPs across Europe. Brunel University, London.

HBSC (2005). Inequalities in young people's health. Health Behavior in school aged children. International Report from the 2005/2006 survey. Health policy for children and adolescents, No 5. WHO.

Hunter Fager J, Mazurek Melnyk B (2004). The Effectiveness of Intervention Studies to Decrease Alcohol Use in College Undergraduate Students: An Integrative Analysis. Worldviews on Evidence-Based Nursing; 1(2): 102-119.

Jernigan DH (2001). Global Status Report: Alcohol and Young People. World Health Organization, Geneva.

Jiménez-Martín S, Labeaga JM, Martínez-Granado M (2003). An Empirical Analysis of the Demand for Physician Services Across the European Union. Fundación Centro de Estudios Andaluces, Sevilla.

Lachner G, Wittchen HU (1997). Familiär übertragbare Vulnerabilitätsmerkmale für Alkoholmissbrauch und –Abhängigkeit. In Watzel H, Rockstroh B (Ed). Abhängigkeit und Missbrauch von Alkohol und Drogen. Göttingen: Hogrefe 1997.

Lachner G, Wittchen HU (1997). Familiär übertragene Vulnerabilitätsmerkmale für Alkoholmissbrauch und -abhängigkeit. In: Watzl H, Rockstroh B (Hrsg.): Abhängigkeit und Missbrauch von Alkohol und Drogen. Hogrefe, Göttingen, S.43ff.

Lewit EM, Baker LS, Corman H, Shiono PH (1995). The direct cost of low birth weight. Future Child. Spring; 5(1):35-56.

Li H, Zhu Y (2006). Income, Income Inequality, and Health. Evidence from China. Journal of Comparative Economics; 34(4): 668-693.

Lupton C, Burd L & Harwood R (2004). Cost of fetal alcohol spectrum disorders. American Journal of Medical Genetics; 127C(1):42-50.

MacDonald R (2001). Eating disorders. Student BMJ; 09:217-260.

May PA, Gossage JP (2001). Estimating the prevalence of fetal alcohol spectrum disorders: summary. Alcohol Res Health; 25: 159–67.

McKee M (2003). What are the lessons learnt by countries that have had dramatic reductions of their hospital bed capacity? Copenhagen, WHO Regional Office for Europe (Health Evidence Network report. Date of access 08 July 2008: http://www.euro.who.int/Document/E82973.pdf.

Minsitry of Social Affairs and Health (2007). Maternity and child welfare clinics. Date of access: 25 June 2008. http://www.stm.fi/Resource.phx/eng/subjt/famil/fpoli/maternityclinic.htx. OECD (2007 a). Health at a Glance.

Nicholls D, Viner R (2005). Eating disorders and weight problems. BMJ; 330: 950-953.

Nicholson M, Hoye R (2009). Reducing adolescents' exposure to alcohol advertising and promotion during televised sports. Jama; 301(14): 1479-1482.

Niederlaender E (2006). Causes of death in the EU. In: Statistics in focus – Population in social conditions 10/2006. Eurostat.

OECD (2007 a). Health at a Glance.

OECD (2007). Health at a glance 2007: Focus on Quality of Care.

Patton GC, Selzer R, Coffey C, Carlin J B, Wolfe R (1999). Onset of adolescent eating disorders: population based cohort study over years. BMJ; 318: 765-768.

Peltoniemi, T (2005). Children in alcohol and drug abusing families in Finland 1994 and 2004. A-Clinic Foundation, Helsinki, Finland. A-Clinic Foundation/Fragile Childhood, Helsinki, Finland. Manuscript.

Petersen PE (2003). Changing oral in central and Eastern Europe. International Journal of Epidemiology; 36: 458-467.

Petersen PE (2003).The World Oral Health Report 2003: continuous improvement of oral health in the 21st century – the approach of the WHO Global Oral Health Programme. Community Dent Oral Epidemiol; 31(1): 3-24.

Pickett KE, Wilkinson RG (2007). Child wellbeing and income inequality in rich societies: ecological cross sectional study. BMJ, 335; 1080.

Ponicki WR, Gruenewald PJ, LaScala EA (2007). Joint impacts of minimum legal drinking age and beer taxes on US youth traffic fatalities, 1975 to 2001. Alcohol Clin Exp Res; 31(5): 804-813.

Rehm J, Eschmann S (2002). Global monitoring of average volume of alcohol consumption. Soz.-Präventivmedizin; 47: 48-58.

Rehm J, Sulkowska U, Manczuk M, Boffetta P et al (2007). Alcohol accounts for a high proportion of premature mortality. Bmj; 330: 950.

Reidpath DD Allotey P (2003). Infant mortality rate as an indicator of population health. J. Epidemiol. Community Health; 57: 344-346.

Rigby M, Köhler L (2002). Child Health Indicators of Life and Development (CHILD). Report to the European Commission. European Union Community Health Monitoring Program.

Roos NP, Shapiro E (1995). Using the information system to assess change: the impact of downsizing the acute sector. Medical Care; 33(12): 109–126.

Savedoff, D (2007). What Should A Country Spend On Health Care? Health Affairs; 26(4):962-970.

Science Group of the European Alcohol and Health Forum (2009). Does marketing communication impact on the volume and patterns of consumption of alcoholic beverages, especially by young people? - a review of longitudinal studies. Date of access: 25 March 2009. http://ec.europa.eu/health/ph_determinants/life_style/alcohol/Forum/docs/science_o01_en.pdf

Tay R (2004). Mass media campaigns reduce the incidence of drinking and driving. Evidence-based healthcare and Public health; 9(1): 26-29.

Vargas C M, Ronzio CR (2006). Disparities in Early Childhood Caries. BMC Oral Health. 2006; 6(1): 3.

Wagenaar AC, Salois MJ, Komro KA (2009). Effects of beverage alcohol price and tax levels on drinking: a meta- analysis of 1003 estimates from 112 studies. Addiction; 104: 179-190.

Wagenaar AC, Toomey TL (2002). Effects of minimum drinking age laws: review and analyses of the literature from 1960 to 2000. J Stud Alcohol Suppl; 14: 206-225.

Weinbrenner S, Wörz M, Busse R (2007). Gesundheitsförderung in Europa. Ein Ländervergleich. G&G Wissenschaft (2). Wissenschaftliches Institut der AOK.

White D, Raeside R, Barker D (2000). Road accidents and children living in disadvantaged areas. CRU Development Department Research Findings; No. 81.

WHO (2002). The World Health Report 2002. Reducing Risks, Promoting Healthy Life. World Health Organization, Geneva.

WHO (2004). Global Status Report on Alcohol 2004. World Health Organization Department of Mental Health and Substance Abuse, Geneva.

WHO (2005a). Alcohol Policy in the WHO European Region: current status and the way forward. Regional Office for Europe. Copenhagen and Bucharest.

WHO (2005b). Suicide prevention – WHO European Ministerial Conference on Mental Health. Facing the challenges, building solutions. Helsinki.

WHO (2007a). The European Tobacco Control Report. WHO regional office for Europe. Copenhagen.

WHO (2008a). Children and road traffic injury. Fact sheet “World report on child injury prevention”.

WHO alcohol control database. http://data.euro.who.int/alcohol/

WHO. European health for all database (HFA-DB). http://data.euro.who.int/hfadb/.

Wilkinson RG (2000). Inequality and the social environment: a reply to Lynch et al. J Epidemiol Community Health; 54:411-413.

World Bank (2007). World Development Indicators 2007. Washington.

Xu K, Evans D, Carrin G, Aguilar-Rivera AM (2005). Designing Health Financing Systems to Reduce Catastrophic Health Expenditure. WHO: Technical Briefs for Policy Makers No.2.

Xu K, Evans DB, Kawabata K, Zeramdini R, Klavus J, Murray CJL (2003). Household catastrophic health expenditure: a multicountry analysis. The Lancet; 362: 111-117.

Xu, K, Evans DB, Carrin G, Aguilar-Rivera AM, Musgrove P, Evans, T (2007). Protecting Households From Catastrophic Health Spending. Health Affairs; 26(4):972-983.

Young B (2002). How Long People Live in Full Health: Disability-Adjusted Life Expectancy (DALE) in Korea. Abstr Acad Health Serv Res Health Policy Meet; 19: 13.