



AMPHORA – Alcohol Public Health Research Alliance

Deliverable D2.1 – Report on comparative analyses of effectiveness and cost-effectiveness of European alcohol policy measures

Common indicators and measures of effectiveness and cost-effectiveness

This report covers two issues: common indicators across Europe for alcohol consumption and alcohol-related harm, and standardized approaches for assessing cost-effectiveness of alcohol policies.

1. Monitoring approaches and their limitations

Statistics

Statistics for health, economic and other harm seem to be the most reliable as they have usually been in use for decades, are provided by well-established government agencies and are relatively well standardized, thanks to numerous international agencies. In addition, some agencies, including the EC and WHO, retrieve, clean and additionally standardize collected statistics. No matter their technical accuracy, however, statistical sources are human products and as such are heavily culture-specific or biased.

Sales statistics, which usually serve as the source for estimation of recorded consumption, often suffer from underestimation of real consumption owing to the existence of other sources of supply. These may be licit (such as duty-free quotas allowed for individual consumption, home production allowed to certain limits in many European countries or non-beverage alcohol bought for individual consumption) or illicit (including smuggling, illegal production, conversion of contaminated ethanol to drinkable fluid for sale as a regular drink, as well as reimported and untaxed alcohol from the legal alcohol industry). In the EU plus Norway, Switzerland and the EU candidate countries, the unrecorded share can vary from a few per cent to more than 35% of overall consumption.

Morbidity statistics can be affected by the level of development of alcohol treatment, as the more specialized the treatment, the greater the chance of being diagnosed as suffering from an alcohol-related disorder. On the other hand, in most countries, alcohol-related diagnoses are stigmatizing. Physicians may, therefore, be reluctant to put causes such as alcoholic liver cirrhosis or acute withdrawal on a death certificate. Time series can be, and in fact are, heavily affected by subsequent changes in the International Classification of Diseases (ICD); for example, the transition from ICD 9 to ICD 10 in Poland was followed by a significant drop in first hospital admissions due to alcoholic psychoses as physicians found a new convenient symbol (F10) without any specification for those who had previously been diagnosed as psychotics.

Surveys

Surveys, in particular broad data collection efforts by international agencies, may also be affected by the varying competence of the government officials who are supposed to respond. Sometimes information may not be reported in order to hide failures in alcohol policy, or some achievements over-emphasized so as to stress the success of a given policy or certain individuals or the reporting agency.

Neither do population surveys constitute an entirely reliable monitoring tool. The major issue is the shrinking response rate in Europe, which often drops below 50% and thus reduces the potential for generalizing findings. There is some evidence that those who do not respond to alcohol surveys are more likely to be either abstainers or heavy drinkers. Moreover, in many cultures, questions about alcohol may be perceived as stigmatizing, and under-reporting is a common problem. On the other hand, school surveys may be biased by both under- and over-reporting, as some youngsters tend to exaggerate their experiences associated with adulthood, including sexual ones as well as drinking and drug-taking.

Large health surveys which include only a few questions on alcohol also have serious disadvantages. As alcohol questions are considered sensitive, large surveys tend to offer these questions for self-administration which is very likely to produce errors, inconsistent responses or no response at all. Moreover, due to the prevailing public health paradigm, interest in such surveys may be reduced to frequent or heavy drinkers, which leads to the experience of light drinkers or abstainers being ignored.

European resources for monitoring

WHO's Global Information System on Alcohol and Health (GISAH) is the primary point of reference for tools for monitoring the health situation and trends in alcohol consumption, alcohol-related harm and policy responses (WHO, 2012). The regional sub-sections, such as the European Information System on Alcohol and Health (EISAH) maintained by the WHO Regional Office for Europe (WHO Regional Office for Europe, 2011b), provide region-specific information and enable comparisons at regional level. Alcohol-related data are organized in six main categories: levels of consumption; patterns of consumption; harms and consequences; economic aspects; alcohol control policies; and prevention, research and treatment. For example, the category alcohol-related harms and consequences includes statistics on alcohol-related morbidity and disease mortality as well as

age-standardized death rates and DALYs for a range of health conditions, road traffic accidents and violence. The EISAH (which is still under development) will include tools for comparative risk assessment.

The data in the WHO alcohol and health information systems are updated through surveys addressed to Member States. Sources of complementary information include the burden of disease project as well as national studies and surveys. Alcohol consumption figures are based on official data on recorded adult per capita consumption supplied by Member States, complemented by data from economic operators and from the United Nation's Food and Agriculture Organization. As well as being used to update the online databases, the data collected are presented in status reports, such as the European Status Report on Alcohol and Health (WHO Regional Office for Europe, 2010) which includes country profiles comprising concise information on core indicators.

In recent years there has been increased collaboration between the EC and WHO in the development of data collection and health information systems, notably since 2007 in monitoring the trends in alcohol consumption, alcohol-related harm and alcohol-related policies across the EU. To complement the regular WHO surveys on alcohol and health, additional surveys and questions have been sent to EU member states. The data gathered are presented online in the European Union Information System on Alcohol and Health (EUSAH), maintained by WHO, which enables queries to be focused specifically on EU member states (European Commission, 2011). The information presented in the next chapter on the *EU status report on alcohol consumption, health outcomes and policies* was gathered in 2011 by means of a joint survey between the EC and the Regional Office.

To foster the collection of comparable data on health and health-related behaviour, diseases and health systems, the EC has developed the European Community Health Indicators (ECHI), which at the moment comprise 40 core indicators that are reasonably comparable and for which there is EU-wide agreement regarding definitions and data collection (European Commission, 2012a). Total alcohol consumption is included as a key determinant of health, measured by the consumption of pure alcohol per person aged 15 years and older. The information is provided by WHO.

The EC collects data on individual alcohol consumption through the European Health Interview Survey (EHIS), managed by Eurostat (EHIS, 2011). Starting from 2014, the EHIS will be conducted every five years in all EU member states. The survey includes a limited number of questions on the

frequency and volume of alcohol consumption but does not measure health outcomes or other adverse consequences.

At the moment, EU-wide survey data on the drinking patterns of adults are only available in Eurobarometer surveys. The Eurobarometer is basically a public opinion survey tool. The surveys are carried out in all member states as face-to-face interviews, typically with representative samples of 600–1500 respondents aged 15 years and older (European Commission, 2012b). Alcohol-related data were gathered through Eurobarometer surveys on an ad hoc basis in 2006 and 2009.¹

Alcohol consumption by teenagers is regularly monitored across Europe through two surveys. The Health Behaviour in School-Aged Children (HBSC) is a WHO collaborative cross-national study carried out at four-year intervals in practically all EU member states. The HBSC respondents are aged 11, 13 and 15 years (HBSC, 2002).² The European School Survey Project on Alcohol and other Drugs (ESPAD) is a collaborative initiative of international research teams, supported by the Council of Europe, the EC and the Swedish government. The ESPAD study is carried out every four years with the participation of almost all EU member states. The ESPAD respondents are schoolchildren aged 15–16 years (Hibell et al., 2009).³ The HBSC and the ESPAD surveys are both carried out in a standardized fashion in order to produce comparable data for monitoring trends over time and enabling cross-country comparisons. Both surveys cover lifetime alcohol use, frequency of current use and drinking to drunkenness, using slightly different questions. The ESPAD survey also yields information on the volume of alcohol consumption as well as on risk perceptions and any harm experienced.

Along with national population surveys, the ESPAD survey is the main information source for reports from the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) in which alcohol consumption is examined along with illicit drugs, typically in a polydrug use context, and the data are used in annual reports on the state of the drugs problem in Europe or in reports focused on specific issues. An example is the selected issue report on *Drug use and related problems among very young people (under 15 years old)* (EMCDDA, 2007).

¹ Examples are: *Attitudes towards alcohol*, Special Eurobarometer 272b/2007; and *EU citizens' attitudes towards alcohol*, Special Eurobarometer 331/2010. Questions relating to alcohol have also been included in surveys focused on other topics, for example: *Road safety*, Flash Eurobarometer 301/2010; and *Youth attitudes on drugs*, Flash Eurobarometer 330/2011 (European Commission, 2012b).

² The results of the 2009/2010 survey round are not yet available.

³ The results of the 2011 survey round are not yet available.

The variations in survey methods and a lack of comparable data on alcohol consumption patterns, which hamper cross-country comparisons and the forming of an overall view of alcohol consumption in the EU, were addressed in the EU-funded project on Standardizing Measurement of Alcohol Related Troubles (SMART) (SMART, 2012). The project collated and assessed the survey instruments for drinking habits used at national level in EU member states and developed a questionnaire which was pilot-tested in 10 member states with a total of 2000 respondents. The questionnaire proved to work well in the context of different drinking cultures, taking no more than 15–20 minutes in a face-to-face interview (Moskalewicz & Sierosławski, 2010). The final result is a standardized comparative survey methodology comprising the survey instrument and guidelines for application and for calculating annual alcohol consumption, unrecorded consumption, prevalence of episodic heavy drinking, prevalence of alcohol dependence, and alcohol-related harm for drinkers and for third parties. The survey instrument is currently available in 11 languages.

To facilitate the monitoring and assessment of progress towards the aims of the EU strategy to support member states in reducing alcohol-related harm (European Commission, 2006), the EC set up a Committee on Alcohol Data Collection, Indicators and Definitions, with the remit to identify common indicators for use at national and EU level based on existing sources of comparable data (European Commission, 2012c). The Committee identified three key indicators which they recommend for monitoring alcohol consumption and related harm:

- *volume of consumption* measured by total (recorded and unrecorded) yearly consumption of pure alcohol per capita (at age 15 years or older);
- *pattern of consumption* measured by harmful drinking defined as an intake of 60 g of pure alcohol or more on one occasion, monthly or more often, during the previous 12 months;
- *alcohol-attributable health harm* measured by alcohol-attributable years of life lost, with chronic and acute conditions as sub-indicators.

The source of information for the volume of alcohol consumption is the WHO alcohol information system. The source of information for harmful alcohol consumption (self-reported) will be the EHIS survey. Calculations relating to alcohol-attributable years of life lost can be done based on mortality statistics collected by Eurostat.

Four indicators for monitoring trends in alcohol use among young people were selected from among the ESPAD survey items:

- *off-premise accessibility of alcohol*, measured by frequency of buying alcohol within the previous 30 days;
- *on-premise accessibility of alcohol*, measured by frequency of drinking on-premise within the previous 30 days;
- *binge-drinking*, defined as having five or more drinks on one or more occasions within the previous 30 days;⁴
- *prevalence of alcohol consumption by adolescents*, measured by the percentage of adolescents who report having drunk within the previous 12 months.

Three indicators were identified for monitoring trends in alcohol-related harm among adults, based on hospital discharge data and mortality data collected by Eurostat:

- *prevalence of alcohol-attributable chronic physical disorders*, measured by hospital discharge rates for alcoholic liver cirrhosis (ICD-10 code K70) and pancreatitis (ICD-10 codes K85–87) as proxy for alcohol-attributable disease;
- *prevalence of alcohol-attributable chronic mental disorders*, measured by hospital discharge rates;
- *alcohol-attributable death rates*.

2. Assessing cost-effectiveness of alcohol policies

WHO's CHOosing Interventions that are Cost Effective (CHOICE) model provides estimates of the costs of implementing certain policies and estimates of the benefits likely to be accrued. Although based on the best available implementation costs at the country level and on the best available evidence for implementation effects, they are, of course, just models. However, they do give policy-oriented guidelines for the most likely cost-effective approaches for improving health. Full details and technical information can be found on the CHOICE website (WHO, 2012b). A summary of the estimated implementation costs and impact of different alcohol policy interventions, compared to a Europe with none of these policies, is shown in Table 1, with an estimate of the cost per DALY saved summarized in Fig. 1 (WHO Regional Office for Europe, 2009a).

⁴ In the ESPAD survey instrument, a drink is defined as: approximately a glass/bottle/can of beer (25–33 cl), a glass/bottle/can of cider (25–33 cl), a bottle of alcopops (27 cl), a glass of wine (10–12.5 cl) or a glass of spirits (4 cl).

Table 1. Costs, impact and cost-effectiveness of different policy options in Europe

Target area Specific intervention(s)	Coverage (%)	WHO sub-region (exemplar countries)								
		Eur-A (e.g. Spain, Sweden)			Eur-B (e.g. Bulgaria, Poland)			Eur-C (e.g. Russian Federation, Ukraine)		
		Annual cost per million person s ^a	Annual effect per million persons (DALYs saved)	I\$ per DALY save d ^b	Annual cost per million person s ^a	Annual effect per million persons (DALYs saved)	I\$ per DALY save d ^b	Annual cost per million person s ^a	Annual effect per million persons (DALYs saved)	I\$ per DALY save d ^b
School-based education	80	0.84	–	N/A ^c	0.70	–	N/A ^c	0.34	–	N/A ^c
Mass media campaign	80	0.83	–	N/A ^c	0.95	–	N/A ^c	0.79	–	N/A ^c
Brief interventions for heavy drinkers	30	4.20	672	6256	0.77	365	2100	1.78	667	2671
Drink-driving legislation and enforcement (via random breath-testing campaigns)	80	0.77	204	3762	0.74	160	4625	0.72	917	781
Reduced access to retail outlets	80	0.78	316	2475	0.56	414	1360	0.47	828	567
Comprehensive advertising ban	95	0.78	351	2226	0.56	224	2509	0.47	488	961
Increased excise taxation (by 20%)	95	1.09	2301	472	0.92	726	1272	0.67	1759	380
Increased excise taxation (by 50%)	95	1.09	2692	404	0.92	852	1083	0.67	1995	335

Tax enforcement (20% less unrecorded)	95	1.94	2069	939	1.26	706	1780	0.87	1741	498
Tax enforcement (50% less unrecorded)	95	2.21	2137	1034	1.34	790	1692	0.93	1934	480

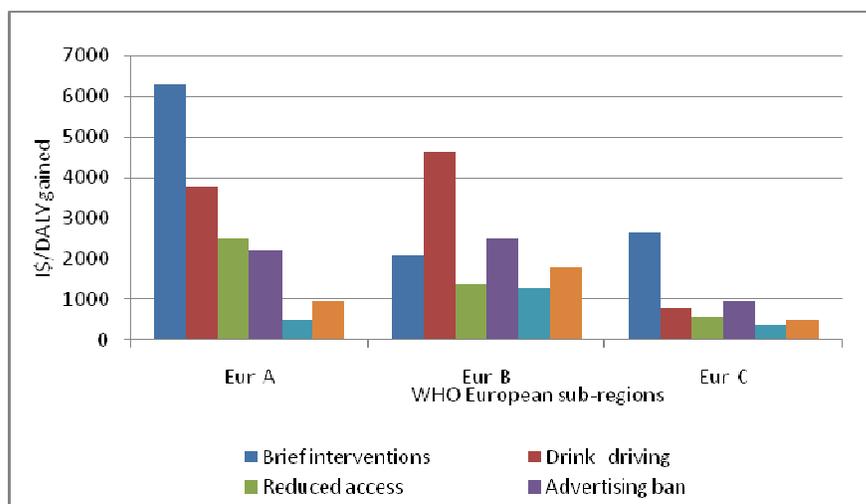
^a Implementation cost in 2005 international dollars (millions).

^b Cost-effectiveness ratio, expressed in terms of international dollars per DALY saved.

^c Not applicable because the effect size is not significantly different from zero (the cost-effectiveness ratio would therefore approach infinity).

It should be remembered in all economic analyses of alcohol policies that, although tax increases bring in extra revenue for governments, economists regard these revenues as revenue-neutral, since the money raised can be rebated to consumers by allowing an equal reduction in other taxes, such as income taxes.

Fig. 1. Cost-effectiveness estimates, in I\$/DALY gained, for various forms of alcohol policy action in three subregions of the WHO European Region



Note. Cost-effectiveness is inversely proportional to the height of the bars. For a description of each action used in the calculations, see WHO, 2009b.

For information and education, and community action, the costs of school-based education and mass-media awareness campaigns have been estimated respectively. Although these interventions are not expensive, they do not notably alter consumption levels or health outcomes.

In relation to the health sector response, the estimated cost-effectiveness of such interventions is not as favourable as the population-level policy instruments summarized below because they require direct contact with health care professionals and services. Although brief interventions are the most expensive to implement, it should be noted that within health service expenditure, brief interventions for hazardous and harmful alcohol consumption are one of the most cost-effective of all health service interventions in leading to improved health. Where drink-driving policies and countermeasures are concerned, the estimated cost-effectiveness ranged from I\$ 781 (in Eur-C countries) to I\$ 4625 (in Eur-B countries).

Reducing access to retail outlets for specified periods of the week and implementing a comprehensive advertising ban are estimated to have the potential to be cost-effective countermeasures, but only if they are fully enforced (each healthy year of life restored costs between I\$ 567 and I\$ 2509).

Tax increases (of 20% or even 50%) are estimated to be highly cost-effective throughout Europe. Even accounting for longer life, and thus potentially increased social welfare costs, taxation remains a highly cost-effective alcohol policy option. The effect of alcohol tax increases could be mitigated by illegal production, tax evasion and illegal trading, which account for approximately 12% of all consumption in Eur-A countries and 40% in Eur-B and Eur-C countries. Reducing this unrecorded consumption (by 20–50%) via concerted tax enforcement efforts is estimated to cost 50–100% more than a tax increase but to produce similar levels of effect. In settings with higher levels of unrecorded production and consumption, increasing the proportion of consumption that is taxed (and therefore more costly to the price-sensitive consumer) may represent a more effective pricing

policy than a simple increase in excise tax, which may only encourage further illegal production, smuggling and cross-border purchases.

Figs. 2-4 plot the total costs and effects of each single and combined intervention on an expansion curve. The lower right boundary of this plot represents the increasing incremental cost of saving one additional DALY and indicates the most efficient way of combining different strategies. Interventions to the north-west of this cost-effectiveness frontier or expansion path are “dominated”, i.e. they are less effective and/or more costly than (a combination of) other interventions. The most cost-effective options are those that occur on the inflections of the expansion path. In all three subregions of Europe, the most cost-effective option is increased taxation (current + 50%); followed by increased tax and scaled-up tax enforcement in Eur-A and Eur-C countries and increased tax and reduced access in Eur-B countries; followed by increased tax, scaled-up tax enforcement and reduced access in all three subregions; followed by increased tax, scaled-up tax enforcement, reduced access, an advertising ban and brief advice in all three subregions.

Importantly for policy discussions, it should be noted that the current intervention mix (■), does not appear on any of the expansion paths, indicating room for improvement from a cost-effectiveness point of view, and that more DALYs could, therefore, be saved by increasing the taxation level, and improving coverage of interventions and enforcement, possibly even in the current budgetary range using resource re-allocation.

Finally, it should be noted that a comprehensive policy that combines individual elements can be far more cost-effective than the individual policy elements alone. For example, current taxation plus a 50% increase, which lies at the first inflexion of the expansions path in Eur-A has an incremental and average cost-effectiveness of I\$ 404/DALY averted. The next inflection (increased tax and scaled-up enforcement) has an incremental cost-effectiveness of I\$ 991 and an average cost-effectiveness of I\$ 647. The third inflection (increased tax, scaled-up enforcement and reduced access) has an incremental cost-effectiveness of I\$ 2252 and an average cost-effectiveness of I\$ 776. The final point (increased tax, scaled-up enforcement, reduced access, advertising ban and brief advice) has an incremental cost-effectiveness of I\$ 6923 and an average cost-effectiveness of I\$ 1517.

Fig. 2. Expansion path of cost-effectiveness in Eur-A countries

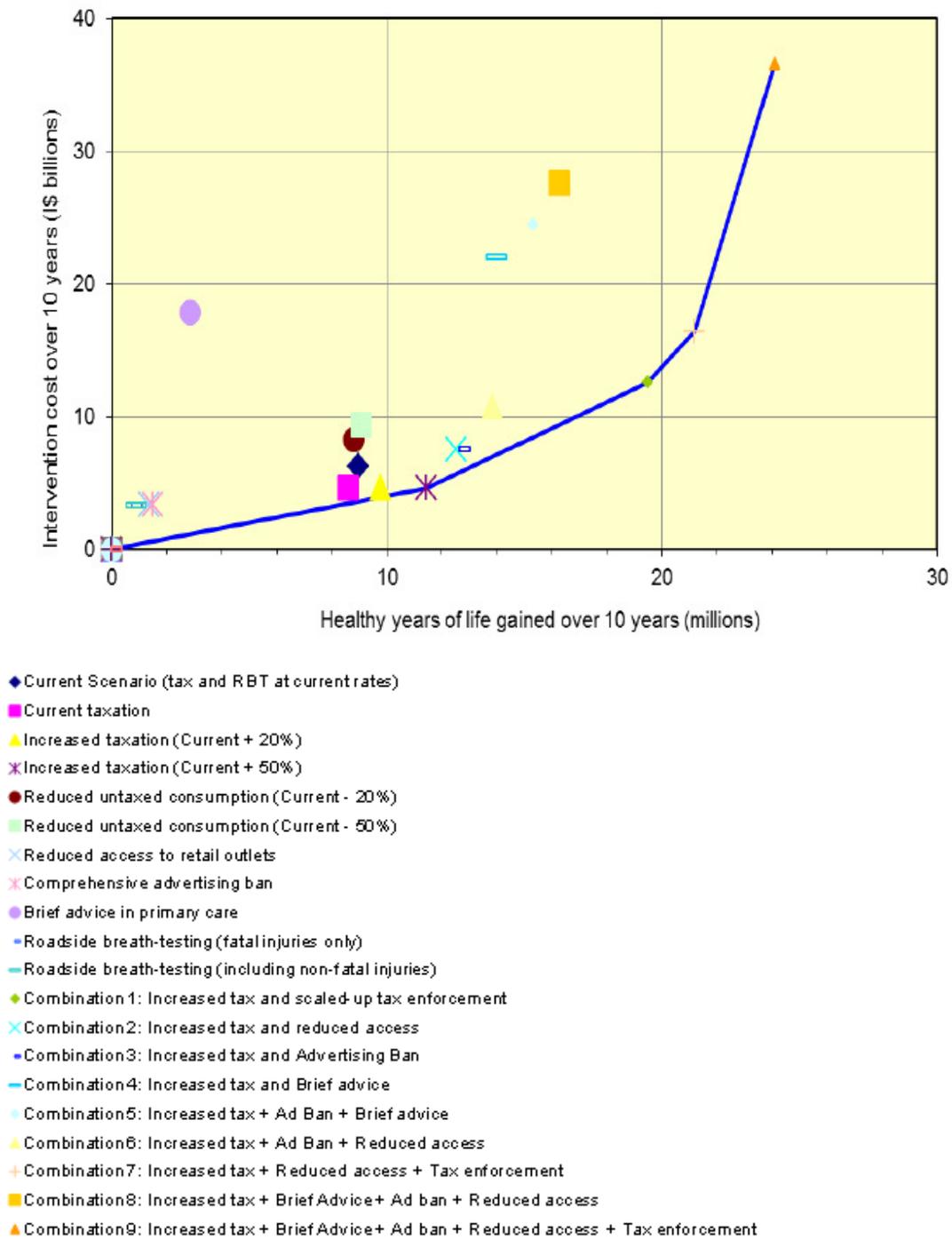


Fig. 3. Expansion path of cost-effectiveness in Eur-B countries

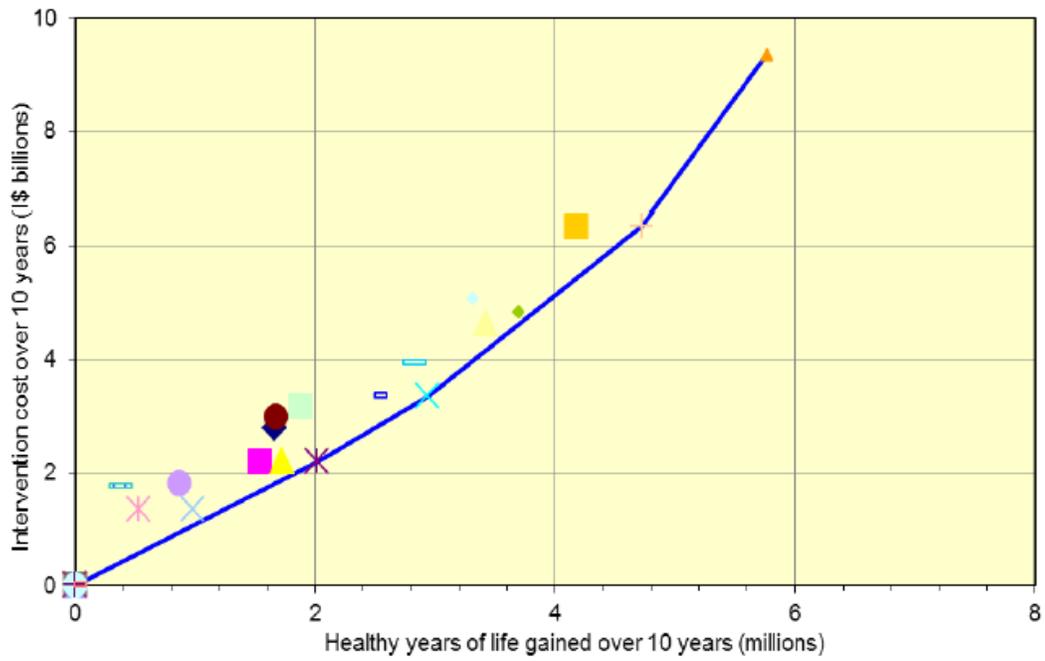
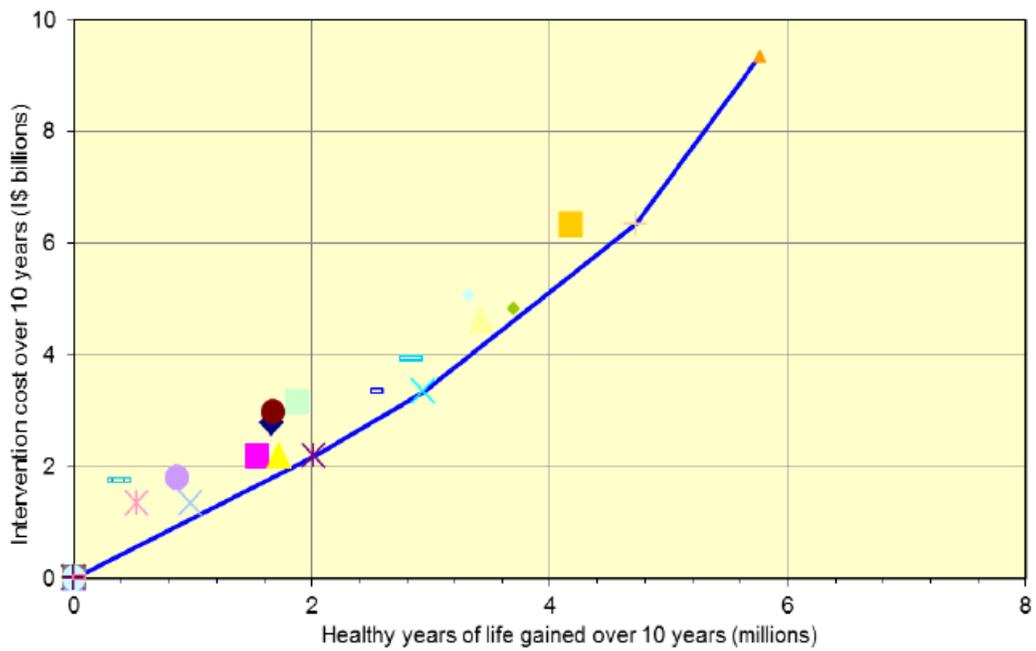


Fig. 4. Expansion path of cost-effectiveness in Eur-C countries



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