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Epidemiology and alcohol policy in Europe

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ABSTRACT

Aims To describe three aspects of the epidemiology of alcohol-attributable deaths in Europe, dose, demography and place, and to illustrate how such knowledge can better be used to inform alcohol policy formulation and implementation. **Design** epidemiological and population health modeling. **Setting** Europe. **Participants** Based on country-specific aggregate statistics. **Measurements** Exposure: country-specific adult per capita consumption triangulated with survey data; outcomes: mortality statistics. **Findings** The absolute risk of dying from an alcohol-attributable disease and injury (accounting for a protective effect for ischaemic diseases) increases with increasing daily alcohol consumption beyond 10g alcohol per day, the first data point. Over 2/3 of all alcohol-attributable deaths occurring amongst the 20–64 year old population of the European Union (minus Cyprus and Malta) occur in the 45–64 year olds. About 25% of the difference in life expectancy between western and eastern Europe for men aged 20–64 years in 2002 can be attributed to alcohol, largely, but not exclusively, as a result of differences in heavy episodic drinking patterns. **Conclusions** Any reduction in the dose of alcohol consumed, at least down to 10g/day, will reduce the annual and lifetime risk of an alcohol-related death. There is a need for alcohol policy to focus on measures in reducing alcohol consumption, throughout middle age, with immediacy of impact. Policy should strive to reduce alcohol-related health inequalities, with the specific recommendations for policy depending on the cost-effectiveness of interventions related to the epidemiological profile of the country or region under consideration. Fortunately, there are evidence-based policy options that reduce the amount of alcohol consumed and many alcohol-related harms with immediate effect, that reduce the risk of an alcohol-related death in middle age, and that would help to close the health gap between eastern and western Europe.

Keywords Age, alcohol, attributable risk, inequalities, injuries, mortality.

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INTRODUCTION

Alcohol is an important risk factor, globally causing more burden of disease than tobacco [1,2]. World-wide, about one in 25 deaths in 2004 were caused by alcohol (3.8%; among men: 6.3%; among women: 1.1% [1]). As alcohol has many non-fatal outcomes and can cause harm, particularly injuries early in life, the disability-adjusted life years (DALYs), i.e. the years of life lost due to premature death and disability, are proportionally even higher: 4.6% of all DALYs were caused by alcohol (men: 7.6%; women: 1.4% [1]). Most of these DALYs fall into the categories of neuropsychiatric disorders (with the overwhelming majority in alcohol use disorders), unintentional and intentional injuries, cirrhosis of the liver, cardiovascular diseases and cancers. Infectious diseases (including tuberculosis and pneumonia) have also been found to be impacted causally by alcohol, but were not yet included in the above analyses [3–5]. Alcohol, if consumed in a pattern of light regular drinking without heavy episodic drinking patterns, can also have a positive impact, mainly on ischaemic cardiovascular diseases [6]. The above figures are net figures, taking into account the protective effects.

The global picture hides considerable variability in the effects of alcohol. Large regions of the world, such as the Islamic countries in the southern and eastern Mediterranean region and in the Near East, have abstainer rates

of more than 90% or higher, and very little alcohol-attributable harm. Conversely, the European region has the highest impact of alcohol, with about 6.5% of the deaths (men: 11.0%; women: 0.8%) and 11.6% of the DALYs (men: 17.3%; women: 4.4% [1]) attributable to alcohol.

Different dimensions of alcohol are responsible for causing harm. The overall volume of consumption over time impacts on most disease categories, whereas irregular heavy drinking occasions in addition impact on injury and ischaemic conditions [7]. The dose–response relationships vary. For diseases where alcohol has a protective relationship there are J-shaped curves, whereas for most other disease categories linear to exponential relationships prevail. For injuries, the acute level of blood alcohol concentration is the most important factor [8]. To a lesser degree, the chemical composition of alcohol beverages may also impact on health [9]. This can be the case in methanol poisoning outbreaks, when methanol is added to spike alcoholic beverages, but also when production leaves too much acetaldehyde which is carcinogenic [10,11].

The purpose of this paper is to describe three aspects of the epidemiology of alcohol-attributable deaths in Europe, dose, demography and place. Under the heading 'dose', life-time risk calculations will be made based, to a large extent, on World Health Organization (WHO) data sources for the combined populations of EUR-A and EUR-B countries [12,13] [Eur-A: very low adult/very low child mortality: Andorra, Austria, Belgium, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Luxembourg, Malta, Monaco, the Netherlands, Norway, Portugal, San Marino, Slovenia, Spain, Sweden, Switzerland and the United Kingdom; Eur-B: low adult/low child mortality: Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Bulgaria, Georgia, Kyrgyzstan, Montenegro, Poland, Romania, Serbia, Slovakia, Tajikistan, the former Yugoslav Republic of Macedonia, Turkey, Turkmenistan, Uzbekistan]. Under the headings 'demography' and 'place', data will be taken from the European Commission co-financed project 'HEM—Closing the Gap—Reducing Premature Mortality' [14,15], which analysed data for 25 European Union countries, with the exception of Cyprus and Malta. While the burden of alcohol is large, policy options are available to reduce this burden [16]. Thus, the second purpose of this paper will be to illustrate how epidemiology can be used more effectively to inform policy formulation and implementation.

ALCOHOL DOSE

Life-time mortality risk is a commonly used standard for evaluating the risk associated with exposure to a particular substance or situation; for instance, in evaluating what are acceptable levels of environmental poisons or food additives. Alcohol-related life-time risk is associated with patterns of drinking as well as the amount of alcohol consumed on each occasion of drinking, and is also influenced by factors such as gender and age. Every drinking occasion contributes to the life-time risk of harm from alcohol. The number of drinking occasions over a life-time varies widely, depending on the frequency of occasions and the span of years over which alcohol is consumed. For example, drinking once or twice a year for ages 18–70 amounts to approximately 100 drinking occasions in a life-time, while drinking most days for the same period would amount to approximately 20 000 drinking occasions.

Mortality of alcohol-related chronic conditions

For this paper, the overall life-time risks for alcohol-related chronic conditions, including cancers, alcohol dependence syndrome, cirrhosis of the liver and cardiovascular diseases (and thus any protective effect), have been modelled for WHO Eur-A and Eur-B countries, based on previous original work [12,13], with the following steps.

Step 1. Identify causal conditions. The relevant literature was searched to identify which disease categories were related causally to alcohol, using the approach of the WHO Comparative Risk Analysis [17,18].

Step 2. Calculate mortality data and parse out the baseline risk without alcohol's involvement, as outlined in detail [12,13]. Briefly, it was calculated by subtracting the alcohol-attributable fraction from the overall death rate for a given region. The last step required multiplying the age, sex and disease baseline risk with the relative risks associated with increasing average daily alcohol consumption (modelled on work by Corrao *et al.* which, based on systematic reviews of the literature, fitted random and fixed-effects linear and non-linear meta-regression models for the effects of average alcohol intake on the risk of each condition [19,20]). This yielded attributable risk estimates for 1 year, assuming that the effect of patterns of drinking remain constant across different levels of average daily consumption.

The results, shown in Fig. 1, find that the annual absolute risk of dying from an alcohol-related disease (accounting for a protective effect for ischaemic diseases) across the population aged 15 years plus of EUR-A and EUR-B combined increases with increasing daily alcohol consumption beyond 10 g alcohol per day, the first data point, with no evidence of a level of alcohol consumption without increased risk and with no substantive difference in risk between men and women.

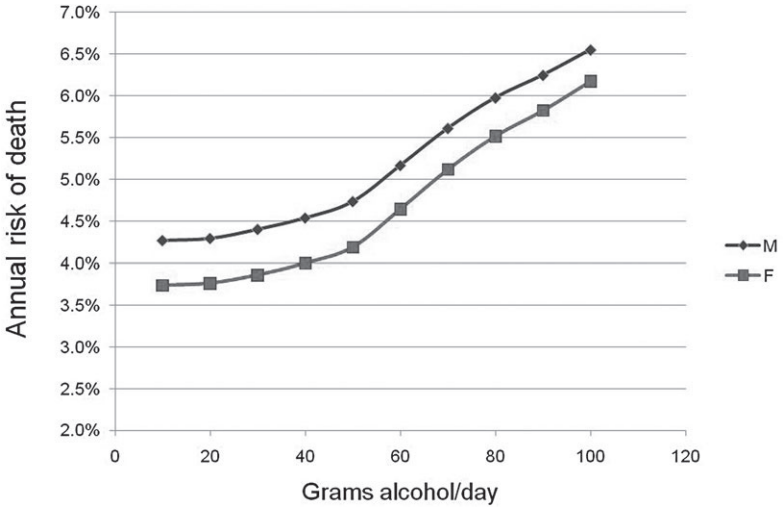

Figure 1 Absolute annual risk of death from alcohol dependence, liver cirrhosis and alcohol-related cancers and cardiovascular diseases net of protective effects from drinking a certain average amount of alcohol daily from 10 g alcohol/day to 100 g/day, for adults aged 15 years plus age-standardized for EUR-A and EUR-B countries combined

Alcohol-related injuries

The approach to calculate injury is detailed elsewhere [13]. This approach is based on both the amount and the frequency of drinking occasions, as risk for an alcohol-related injury is related to the number of drinks per occasion and to the number of drinking occasions over a life-time. To accomplish this, the consumption-specific relative risk was first modelled for injury based on meta-analysis, as part of the WHO's Global Burden of Disease Study [21]. Next, the life-time-attributable risk was calculated to reflect the number of drinking occasions in a given year, the number of drinks consumed at these occasions and the length of intoxication time (modelled on average human alcohol metabolism [22]). This was conducted using the following formula:

$$\Pr(\text{Death}|n) = 1-(1-[\Pr(\text{Death})_d])^N,$$

where $\Pr(\text{Death} \mid n)$ = the yearly probability of injury mortality given n drinking occasions per year, $\Pr(\text{Death})_d$ = the intoxication time-adjusted yearly per-occasion probability of mortality by each injury category, age group, sex and consumption level (computed in step 2) and $N = 365$, to reflect daily drinking (i.e. 365 occasions per year).

The results (Fig. 2), comparing risk to drinking an averaged certain amount daily for the pooled populations of EUR-A and EUR-B, find that the life-time risk of dying form an alcohol-related injury across the total population aged 15 years plus increases exponentially with increasing daily alcohol consumption beyond 10 g alcohol per day, the first data point. At any given level of alcohol consumption, the risks are much higher for men than for women. Of course, average daily consumption may not reflect the drinking that occurred on the day of actual injury.

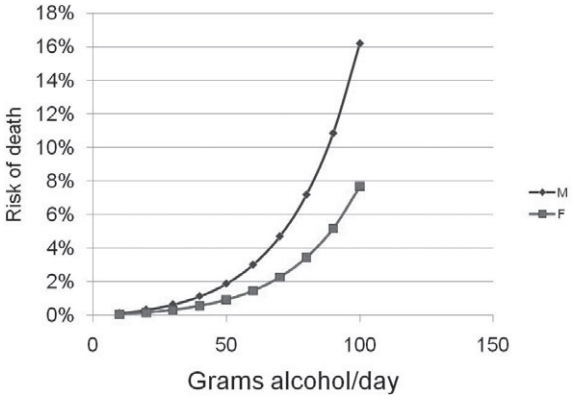

Figure 2 Adult life-time risk of death from, from drinking a certain average amount of alcohol daily, EUR-A and EUR-B countries combined. Absolute life-time risk of death from alcohol-related intentional and unintentional injuries from drinking a certain average amount of alcohol daily from 10 g alcohol/day to 100 g/day, for adults aged 15 years plus age-standardized for EUR-A and EUR-B countries combined

DEMOGRAPHY

For the 20–64-year-old population of the European Union (minus Cyprus and Malta), although a higher proportion of all deaths are due to alcohol among the 20–44-year-old population (approximately one in five), than among the 45–64-year-old population (approximately one in nine), the absolute number of alcohol-attributable deaths is larger in later adulthood (Table 1). More than two-thirds of all alcohol-attributable deaths occurring among the 20–64-year-olds occur in the 45–64-year-olds.

PLACE

There is also substantial variation in the geographical distribution of the rates of alcohol-attributable deaths

Table 1 Premature alcohol-attributable deaths (under age 65) for different parts of Europe (own calculations based on Zatonski *et al.* [14]).

2002		*All alcohol-attributable deaths*			*% of all premature alcohol-attributable deaths*			*Premature alcohol-attributable deaths as proportion (in %) of all deaths*		
Groups	*Country*	*Males*	*Females*	*Total*	*Males*	*Females*	*Total*	*Males*	*Females*	*Total*
20–44	Russian Federation	72 941	12 388	85 329	45.0%	48.6%	45.5%	33.1%	20.5%	30.4%
	EU10	13 343	2 012	15 354	31.6%	32.8%	31.8%	29.3%	13.1%	25.3%
	EU15	20 499	4 242	24 740	32.1%	26.7%	31.0%	22.3%	10.3%	18.5%
45–64	Russian Federation	89 273	13 103	102 375	55.0%	51.4%	54.5%	19.0%	6.7%	15.4%
	EU10	28 861	4 124	32 984	68.4%	67.2%	68.2%	16.4%	5.3%	13.0%
	EU15	43 453	11 663	55 116	67.9%	73.3%	69.0%	13.1%	6.8%	10.9%
20–64	Russian Federation	162 214	25 490	187 704	100.0%	100.0%	100.0%	23.5%	10.0%	19.9%
	EU10	42 203	6 135	48 339	100.0%	100.0%	100.0%	19.1%	6.6%	15.3%
	EU15	63 952	15 905	79 857	100.0%	100.0%	100.0%	15.1%	7.5%	12.5%

EU 10 (new countries after 1990 in Central and Eastern Europe): Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. EU 15 (old EU): Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom. EU15: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, the United Kingdom.

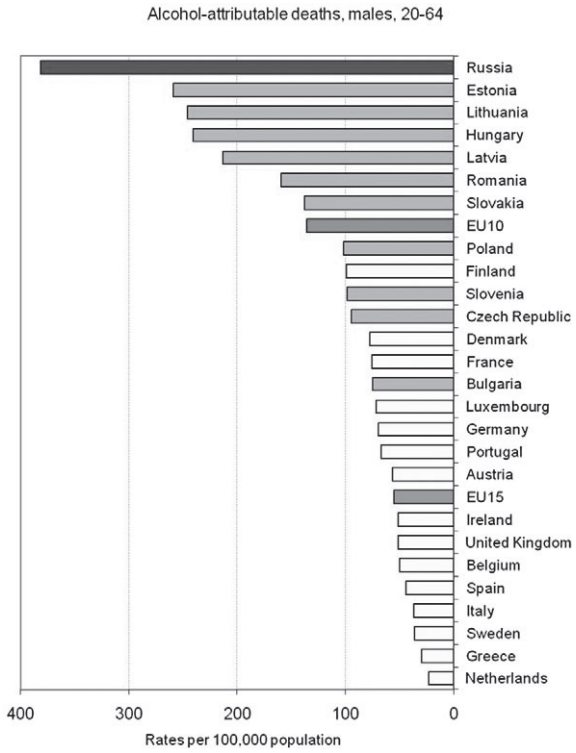

Figure 3 Rates per 100 000 of alcohol-attributable premature mortality (including alcohol-related liver cirrhosis, cancers, cardiovascular diseases and injuries) among male adults aged 20–64 years, 2002. Source: [14]

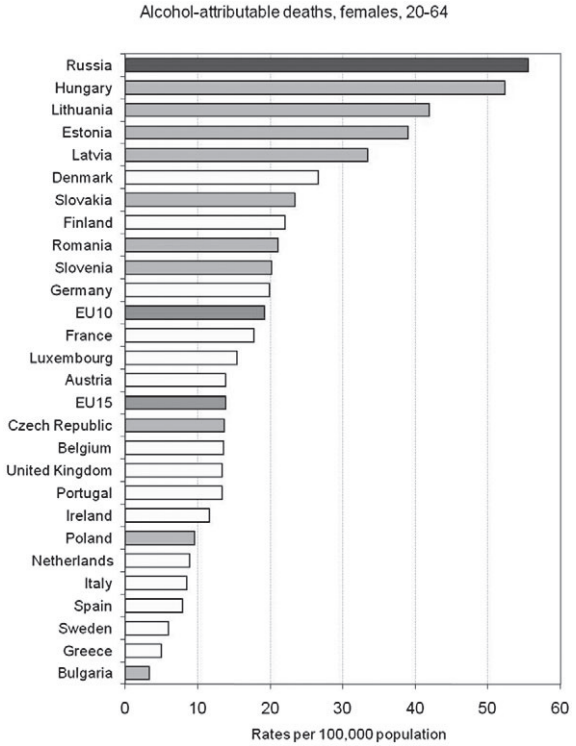

Figure 4 Rates per 100 000 of alcohol-attributable premature mortality (including alcohol-related liver cirrhosis, cancers, cardiovascular diseases and injuries) among female adults aged 20–64 years, 2002. Source: [14]

throughout the European Union (minus Cyprus and Malta) (Figs 3 and 4). The alcohol-attributable mortality rate in the EU10 [EU 10 (new countries after 1990 in Central and Eastern Europe): Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia; EU 15 (old EU): Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom] is more than twice as high as in the EU15 [EU15: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom] for men and 40% higher for women. In the Baltic countries, alcohol-attributable mortality is more than four times higher for men and almost three times higher for women than in the EU15; and in the southern central–eastern European countries (Hungary, Romania and Slovenia), alcohol-attributable mortality is more than three times higher for men and more than two times higher for women than in the EU15. In the four remaining EU10 countries (Bulgaria, Czech Republic, Slovakia and Poland), alcohol-attributable mortality is 80% higher for men, but 20% lower for women than in the EU15. Russia shows an almost sevenfold increased mortality rate for men and fourfold for women compared to the EU15.

In 2002, the difference in male life expectancy at the age of 20 years between the EU15 countries and the three Baltic States (Estonia, Latvia and Lithuania) was nearly 10 years. Approximately 25% of the difference in life expectancy between the EU10 and the EU15 for men aged 20–64 years in 2002 can be attributed to alcohol, largely, but not exclusively, as a result of differences in heavy episodic drinking patterns [14].

POLICY IMPLICATIONS

Alcohol dose

Beyond an average alcohol consumption of 10 g/day the absolute risk of death from an alcohol-related condition, net of a protective effect on cardiovascular diseases, increased with increasing alcohol consumption. For non-injury conditions, there was little difference in risk between men and women. For injuries, the relationship was exponential and greater for men than women at any level of alcohol consumption. The policy implication of these findings is that any reduction in the dose of alcohol consumed, at least down to 10 g/day, the lowest data point, will reduce the annual and life-time risk of an alcohol-related death. Clearly, any reduction in the dose of alcohol consumed, as well as in the frequency of drinking occasions and the amount drunk on a single occasion will have an immediate impact in reducing alcohol-related injuries [22] and those cardiovascular events related to heavy episodic drinking [23]. In fact, this was illustrated by the rapid decreases in injury and cardiovascular deaths during the 1980s Gorbachev campaign in the former Soviet Union [24]; in the 1990s alcohol-attributable deaths soon were at the former and higher levels [24,25]. Even some chronic conditions, such as mortality from liver cirrhosis, also demonstrate an immediacy of impact from reductions in consumption. This was recorded after the above-cited changes in Russia [24] and in France, where rapid reductions in cirrhosis mortality occurred following wine shortages during the Second World War (but see [26]). Other conditions, such as alcohol-related cancers, will have longer time-spans before interventions could show effects, with some reductions in risk occurring soon after changes in consumption, but with the full extent of reductions in risk not occurring until some 15–20 years after reductions of alcohol use [27].

Fortunately, there are policy options that reduce the amount of alcohol consumed, with immediate effect [16]. Chief among these are policies that influence the price of alcohol, with increases in the price of alcohol relative to inflation and income reducing grams of alcohol consumed, with immediate and consequent reductions in certain alcohol-related harms and mortality [28]. Data investigating the impact of price increases in Alaska found an immediate impact on alcohol-related disease mortality [29] and of price reductions in Finland on alcohol-positive sudden deaths [30]. Modelling evidence in the United Kingdom has demonstrated that increasing taxes on alcohol and introducing a minimum price per gram of alcohol have immediate impact in reducing alcohol-related harm and mortality, with incremental gains achieved over a 10-year time-span [31].

Actions that set limits on and reduce the alcohol concentration of beverages are additional strategies that are likely to reduce the overall amount of alcohol consumed. Such strategies are similar to those that reduce the salt content of manufactured foods. To some extent, the revisions to the common wine policy in the European Union, by restricting the addition of must or fortification during the production process, is likely to reduce the alcohol concentration of European-produced wines [32]. Another action to consider is limiting the size of beverage containers or serving portions on an assumption, to be evaluated, that small beverage sizes would lead to less consumption.

Actions that reduce alcohol concentration or beverage size require standard consumer labelling of alcoholic beverages, so that consumers can know the alcohol content quickly (similar to the labelling that informs consumers of the salt or fat content of food). While the evidence shows that the impact of alcohol labelling in changing consumer behaviour is limited [33], effective

labelling would bring alcoholic products into line with other beverages and with foodstuffs.

Demography

Much alcohol policy is predicated on reducing the harm among young consumers, often noting that the young shoulder a disproportionate burden of alcohol-attributable deaths [34]. While the latter findings are true, the data presented in this paper find that two-thirds of all alcohol-attributable deaths in the 20–64-year-old population of the European Union occur in the 20-year age group of 45–64 years than in the 25-year age group of 20–44 years. Similarly, data from the United Kingdom tracking alcohol-specific deaths for the years 1991–2007 show that the largest numbers of deaths occurred among the middle-aged, a group which showed the greatest increase in numbers over the time-period [35]. Due to the importance of life-time exposure and risk of alcohol-attributable death and the recent maintenance of high-frequency and high-volume drinking into middle age [36], there is likely to be upward pressure on alcohol's contribution to the European Union's burden of ill-health, particularly with an ageing population. Thus, it can be argued that in order to reduce rapidly alcohol's health burden to society, priority should be given to actions that have immediate impact on the middle-aged over actions that focus on young people.

Fortunately, the same policy measures that reduce the amount of alcohol consumed with immediate effect also impact on the middle-aged [16]. In addition, primary health care-based screening and advice based programmes are effective among the middle-aged, with evidence of immediate impact in reducing alcohol consumption and related harm, as well as alcohol-related mortality [37].

However, over the long term, it is important to continue with policies that delay the age of drinking onset, as an early age of drinking onset is associated with the development of alcohol dependence in later life [38]. Individuals who grew up in US states where alcohol could be purchased before age 21 years were 30% more likely to develop alcohol use disorders into their 40s and 50s than those who grew up in states where the legal drinking age was 21 [39]. Here, the policy focus should include underage purchase laws [40], rather than school-based education [41] and prevention programmes [42], for which the evidence suggests little impact in reducing alcohol-related harm.

Place

Within the European Union, excluding Cyprus and Malta, approximately 25% of the 7-year difference in male life expectancy at age 20 years between older and newer Member States in 2002 was due to alcohol. Such large inequalities waste human capital, threaten the cohesion and stability of the Union, as well as lead to inefficiency in the overall productivity of the Union. An enormous European investment in the implementation of evidence-based policies should be instituted urgently in the newer Member States, based on cost-effectiveness analyses [43]. For a number of countries, unintentional injuries made up more than 50% of all alcohol-attributable deaths: Estonia (58.4%), Latvia (62.4%) and Lithuania (53.5%). In Latvia and Lithuania, alcohol-attributable intentional injuries additionally constituted more than 20% of the overall alcohol-attributable deaths. In these countries, prevention of alcohol-attributable injury should have priority, with actions focused on specific injuries. In countries where traffic injuries were very high specific policy measures should be implemented, such as intensive random breath testing and penalties for illegal blood alcohol concentration levels [16]. In countries where a large portion of deaths is due to alcohol poisoning (such as in Russia; [25,44]; see also [1]), different methods should be implemented based on the local situation. Usually, poisoning has been linked to overall availability of cheap alcohol, but also contamination of surrogate alcohol may play a role [9]. As a consequence, compounds such as methanol or diethyl phthalate should be prohibited for denaturing alcohol, because they may be problematic if denatured alcohol is sold illegally for human consumption.

A completely different profile can be found in countries where liver cirrhosis dominates the picture of alcohol-attributable deaths. Liver cirrhoses constituted more than 40% of all alcohol-attributable premature deaths in Hungary (53.2%), Romania (40.2%), Slovenia (46.2%), Denmark (48.2%), Germany (50.2%) and the United Kingdom (47.6%). Again, there may be different underlying reasons: first, these are countries which have consumed and still consume large quantities of alcohol. Secondly, their drinking can also be characterized by drinking fruit spirits, often from informal and home production (both recorded and unrecorded). Interestingly, for stone fruit spirits high contamination with ethyl carbamate may occur, which has been shown to be linked with liver disease, including cancer [45,46]. A large exposure survey of the European Food Safety Authority recently indicated a health concern about ethyl carbamate in alcoholic beverages [47]. Policy implications should be drawn both for overall level of consumption as well as for better regulating informal and home production. The first step would be the implementation of an enforceable limit for ethyl carbamate into the European spirits legislation, followed by the adoption of mitigating measures by the producers and an effective and comprehensive Europe-wide control strategy. Preliminary

observations (e.g. from Hungary and Poland [48,49]) on ethyl carbamate in unrecorded fruit spirits, however, lead to concerns that these conventional control strategies might not be sufficient, as the problem may be especially prevalent in unrecorded alcohol. The literature currently offers no effective policy mitigating the problem of contaminated unrecorded alcohol. For instance, strategies could be directed to effectively reducing the illegal alcohol production at all. This, however, will reach only those businesses that produce and/or market unrecorded alcohol on a larger scale, but not the small home producers. Here it would be more effective to legalize the alcohol production and put the producers and products under state supervision. While this might not reduce alcohol consumption *per se*, it might at least remove the problem of product contamination, and therefore remove adverse effects that go beyond the effects of ethanol alone. The existence of a substantial illicit market for alcohol can complicate policy considerations on alcohol taxes; in such circumstances, tax changes require efforts to bring the illicit market under effective government control, for example through taxation policies that increase the attractiveness of lower alcohol content forms of culturally preferred beverages. In addition, there should be much stronger enforcement, including the closure of illegal factories and after-hours production, and the use of tax stamps to record that duty has been paid on informal products.

High numbers and proportions of alcohol-attributable cancer [50] have to be seen in a different light. Basically, the amount of drinking 15–20 years ago reflects the formation of cancer. Thus, if people quit drinking, their relative risks compared to life-time abstainers decrease slowly, and only after 15–20 years is a level similar to life-time abstainers reached [27]. As a consequence, the policy implications are not immediate. For countries such as Italy or France, which in 2002 had high alcohol-attributable cancer proportions within all alcohol-attributable deaths (both >30%), this also reflected the success of their alcohol policies. As consumption and total alcohol-attributable diseases and injuries have been declining over the past 30 years, the relative weight of alcohol-attributable cancers rose. The implication of a high rate of alcohol-attributable cancers thus should not be interpreted as triggering specific policy actions, especially if overall consumption and total alcohol-attributable deaths are declining. Thus, the current initiatives in France and Italy focusing on injury, marketing and advertisement are in line with their epidemiological profile.

DISCUSSION

Alcohol is an important health determinant, leading to a global health burden larger than that of tobacco [2]. Although alcohol-related estimates are based on assumptions and may contain errors, sensitivity analyses have shown that no matter what assumptions are chosen, the burden for alcohol remains high (e.g. [1,18,51]). Thus, no matter if certain disease categories such as infectious diseases are included or excluded, or if the problems associated with episodic heavy drinking can be accounted for adequately or not, the resulting health harm due to alcohol remains high.

The high level of alcohol-attributable disease burden would argue that as intensive and urgent action as has been taken to reduce tobacco's health burden should also be taken for alcohol. The epidemiology of alcohol-related harm can instruct the types of actions that are needed to reduce alcohol's health burden. First, given the dose–response relationship between alcohol and annual and life-time attributable risk of death, any policy or action that reduces the amount of alcohol that passes through the mouth, whether over a drinking occasion, a day, a week or a life-time at least down to an average of 10 g/day lessens the burden. A range of alcohol policies achieve this, and there is scope for additional researched action, such as reducing alcohol strength and portion sizes of alcoholic beverages.

Secondly, given the demography with the absolute size of alcohol-related deaths occurring among the middle age, there is an urgent need to focus strategies and interventions on the middle-aged to achieve large and immediate health gain. Fortunately, the effective policies work on the middle-aged and have an immediate impact in reducing much alcohol-related harm. Early identification and brief advice programmes can also target the middle-aged which, in fact, is a group with the strongest evidence for effect.

Finally, the economic and social development of the European Union as a whole is hampered by the continuing enormous differences in life expectancy between different parts of the Union. Because one-quarter of these differences is due to alcohol, there is an urgent need to focus on alcohol policies to reduce this inequity.

Declarations of interest

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