



**Socio-economic inequalities in  
alcohol consumption and harm:  
Evidence for effective  
interventions and policy across  
EU countries.**



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## Executive Summary

### Recommendations

- The best evidence is for policies which affect affordability (e.g. minimum pricing policies), which have the potential to narrow the socio-economic gap in alcohol-related harm and have been deemed highly cost effective.

### Introduction

This report aims to increase understanding of socio-economic differences in alcohol consumption and harms in the European Union and what can work to reduce these inequalities. It aims to:

- Briefly describe the nature of socio-economic inequalities in alcohol consumption and harm in EU countries
- Summarise recent evidence from EU countries on interventions and policies that can reduce inequalities in harmful alcohol use and associated harms
- Identify any gaps in evidence that could be addressed in the future

### Health impact of alcohol

Across the world, harmful use of alcohol is a major risk factor for many health conditions including liver cirrhosis, cancers, neuropsychiatric conditions and injuries, as well as premature mortality (1). Harmful use of alcohol can be defined “a pattern of alcohol use that causes damage to physical or mental health, while often also having negative social consequences” (2). This pattern includes consuming greater volumes of alcohol, engaging in heavy episodic drinking (e.g. drinking at least 60 grams or more of pure alcohol on at least one occasion in the past 30 days) and, in some cases, drinking poor quality alcohol (e.g. home-made or illegally produced alcoholic beverages) (1). As well as affecting an individual’s health, harmful use of alcohol can also impact negatively on others through for example unintentional or intentional injuries to others, neglect of care responsibilities and Foetal Alcohol Spectrum Disorder (1). Economic costs associated with harmful use of alcohol are substantial and estimated to be 1.3%-3.3% of gross domestic product (1,3,4).

### Patterns of behaviour

Socio-economic differences in levels, patterns and consequences of alcohol consumption exist within EU countries, although the magnitude and direction of gradients often differ. Socio-economic differences in levels of heavy, harmful, hazardous and binge drinking (see page 29 for definitions of key terms) also vary across EU countries and often also by gender.

A range of factors are thought to be associated with alcohol consumption and harm, including socio-economic status (1). Whilst in general, individuals in lower socio-economic status (SES) groups report consuming equivalent or even less alcohol than those in higher SES groups, rates of alcohol-related morbidity and mortality in lower SES groups are higher (5). This has been referred to as the “alcohol harm paradox”.

Possible explanations for the alcohol harm paradox include: a) socio-economic differences in patterns of drinking (e.g. greater prevalence of harmful alcohol consumption such as binge drinking in lower SES groups), b) the harmful effects of alcohol in lower SES groups compounded by higher prevalence of other health harming behaviours such as smoking, excess weight and poor diet/exercise, c) limited access or poorer quality of health care and support services in lower SES groups, d) weaker social support networks among people of lower SES, and e) underestimation of consumption levels and alcohol-related harms among individuals in more deprived communities (6,7). The experience of Adverse Childhood Experiences (known as ACEs<sup>1</sup>) may also be important; individuals in deprived communities have a higher risk of experiencing ACEs (8), and links have been reported between increased ACEs and high-risk drinking later in life (8,9). Recent attempts to explain its causes more clearly suggest that greater likelihood of current and historic binge/heavy drinking among disadvantaged populations and interactions with other health challenging behaviours such as smoking, excess weight and poor diet/exercise especially in deprived, higher-risk drinkers have an important role to play (6,10). However, to date there is no comprehensive explanation for the alcohol harms paradox.

### **Evidence for interventions that reduce inequalities in alcohol-related harm**

There is limited research on alcohol availability (restricting outlet density), screening and brief interventions and skills-based school education programmes and outcomes are mixed.

There is no evidence available for other potentially effective approaches, such as restricting alcohol advertising, community mobilisation, increasing access to health and social services and increasing spending on social protection.

Future research could further explore the potential of 1) restrictions in outlet density/hours of sale, 2) skills-based education programmes targeted in low socio-economic groups, 3) screening and brief intervention targeted in low socio-economic groups and 4) restrictions in alcohol advertising to reduce inequalities in alcohol-related harm.

## **Socio-economic inequalities in alcohol consumption and harm: evidence for effective interventions and policy across EU countries.**

Sara Wood and Mark Bellis, Public Health Wales.

### **Chapter 1: Introduction**

Across the world, harmful use of alcohol is a major risk factor for many health conditions including liver cirrhosis, cancers, neuropsychiatric conditions and injuries, as well as premature mortality (1). Harmful use of alcohol can be defined “a pattern of alcohol use that causes damage to physical or mental health, while often also having negative social consequences” (2). This pattern includes consuming greater volumes of alcohol, engaging in heavy episodic drinking (e.g. drinking at least 60 grams or more of pure alcohol on at least one occasion in the past 30 days) and, in some cases, drinking poor quality alcohol (e.g. home-made or illegally produced alcoholic beverages) (1). As well as affecting an individual’s health, harmful use of alcohol can also impact negatively on others through for example unintentional or intentional injuries to others, neglect of care responsibilities and Foetal Alcohol Syndrome (1). Economic costs associated with harmful use of alcohol are substantial and estimated to be 1.3%-3.3% of gross domestic product (1,3,4).

A range of factors are thought to be associated with alcohol consumption and harm, including socio-economic status (1). Whilst in general, individuals in lower socio-economic status (SES) groups report consuming equivalent or even less alcohol than those in higher SES groups, rates of alcohol-related morbidity and mortality in lower SES groups are higher (5). This has been referred to as the “alcohol harm paradox”. Possible explanations for the alcohol harm paradox include: a) socio-economic differences in patterns of drinking (e.g. greater prevalence of harmful alcohol consumption such as binge drinking in lower SES groups), b) the harmful effects of alcohol in lower SES groups compounded by higher prevalence of other health harming behaviours such as smoking, excess weight and poor diet/exercise, c) limited access or poorer quality of health care and support services in lower SES groups, d) weaker social support networks among people of lower SES, and e) underestimation of consumption levels and alcohol-related harms among individuals in more deprived communities (6,7). The experience of Adverse Childhood Experiences (known as ACEs<sup>1</sup>) may also be important; individuals in deprived communities have a higher risk of experiencing ACEs (8), and links have been reported between increased ACEs and high-risk drinking later in life (8,9). Recent attempts to explain its causes more clearly suggest that greater likelihood of current and historic binge/heavy drinking among disadvantaged populations and interactions with other health challenging behaviours such as smoking, excess weight and poor diet/exercise especially in deprived, higher-risk drinkers have an important role to play (6,10). However, to date there is no comprehensive explanation for the alcohol harms paradox.

Within the European Union, levels of alcohol consumption are among the highest in the world (1) with average consumption levels more than double the world average (11). Addressing health

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<sup>1</sup> Adverse Childhood Experiences (ACEs) are stressful experiences in childhood such as child maltreatment, parental separation, parental incarceration or living with someone that was mentally ill, a problem drinker or that abused drugs.

inequalities, including those related to alcohol harms, is a key challenge and a focus of European wide policy to improve the health and well-being of populations (e.g. Health 2020 [12]). With alcohol use being an important contributor to health inequalities across the region (13), the need for effective action that can close the socio-economic gap in harmful use of alcohol and related morbidity and mortality is clearly needed.

This report aims to increase understanding of socio-economic differences in alcohol consumption and harms in the European Union and what can work to reduce these inequalities. It aims to:

1. Briefly describe the nature of socio-economic inequalities in alcohol consumption and harm in EU countries (Chapter 2);
2. Summarise recent evidence from EU countries on interventions and policies that can reduce inequalities in harmful alcohol use and associated harms (Chapter 3);
3. Identify any gaps in evidence that could be addressed in the future (Chapter 4).

The report focuses specifically on the following drinking categories: harmful and hazardous drinking, binge drinking, underage drinking and drinking in pregnancy. These were regarded as being the most important categories to examine when exploring harms caused by alcohol use. A glossary of frequently used alcohol terms can be found on page 29.

## Chapter 2: The nature of socio-economic inequalities in alcohol consumption and harm

### Alcohol consumption

Socio-economic, educational or income differences in levels and patterns of alcohol consumption have been reported in many EU countries. However, the magnitude and direction of inequalities often differs between regions of the EU and individual member states. Links between social disadvantage and alcohol consumption are likely affected by wider factors such as culture, religion, economics and alcohol policies, which may affect people's desire and opportunities to drink (14).

#### *Current drinking*

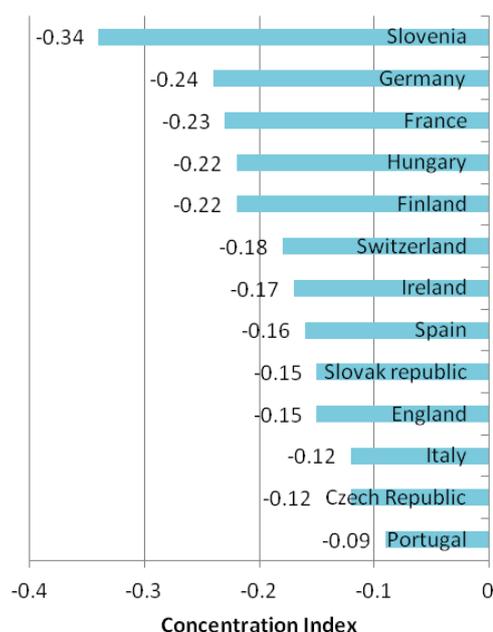
In general, across European countries, males and females with the lowest educational attainment/SES are less likely to be current drinkers (15) and are more likely to abstain (16; 17) than those with higher educational attainment. However, the magnitude of this difference varies by country (15), with Germany, Slovenia and France reporting the largest differences for both sexes. Furthermore, for males in the Czech Republic, the direction of difference is reversed so that a lower educational attainment is associated with greater likelihood of current drinking (15; Figure 1). In general, a stronger association between education level and current drinking status has been found to exist among higher compared to lower income countries (17).

**Figure 1: Concentration Indexes (measure of socio-economic inequality) for consuming alcohol in the last 12 months\*.**

#### Males



#### Females



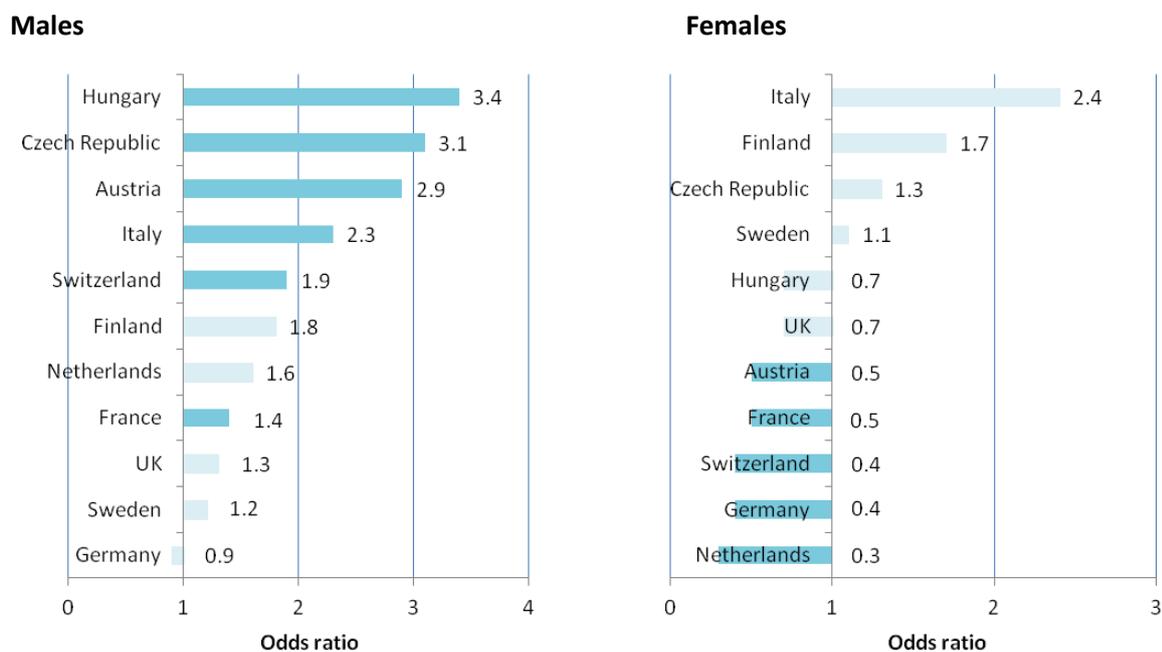
\*Adapted from OECD, 2015 (15). The Concentration Index (from -1 to 1) measures the size of inequalities for a given variable (here, the consumption of alcohol in the last 12 months). A negative index indicates that people with lower SES are *less* likely to consume alcohol; a positive index indicates that people with lower SES are

more likely to consume alcohol. The closer the concentration index is to 1 or -1, the larger the inequality; a concentration index of 0 means that there are no inequalities. All Concentration Indexes are statistically significant.

*Heavy, harmful and hazardous drinking*

Relationships between socio-economic status/education and heavy drinking vary by gender. In the Netherlands, Germany, Switzerland, France and Austria, women with higher educational attainment are generally more likely to drink heavily than those with lower educational attainment (16;18). However, this relationship varies across European countries and the pattern is reversed in Italy, Finland and the Czech Republic (16; Figure 2). Among men, the pattern for heavy drinking is strong and in the opposite direction: those of lower educational attainment are generally more likely to be heavy drinkers than those of higher educational attainment (16; Figure 2).

**Figure 2: Odds ratios for heavy drinking among low educated groups (reference group: high education)\***

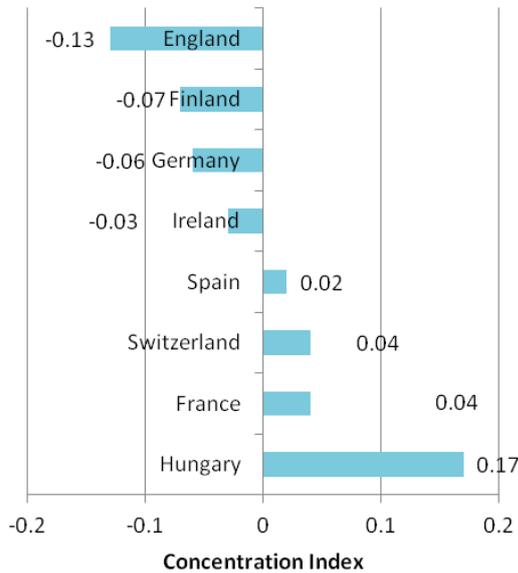


\*Adapted from Bloomfield et al, 2006 (16). Darker blue bars indicate that the odds ratio is significant.

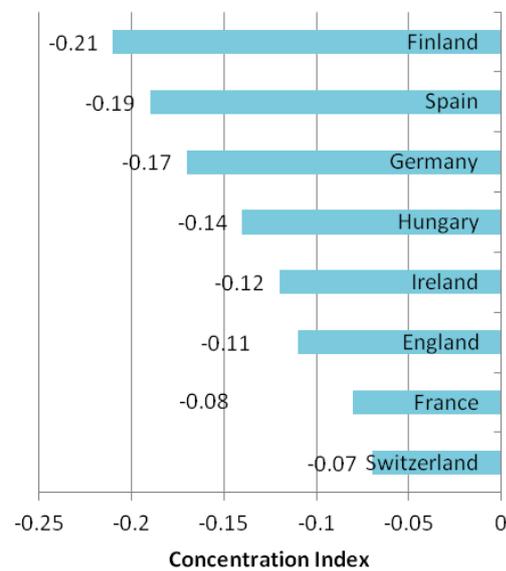
For hazardous drinking, females of lower education/SES are less likely than those with higher education/SES to drink at hazardous levels (15; Figure 3). The pattern for males, however, is less clear. Whilst men with greater levels of education/SES are more likely to drink at hazardous levels in some EU countries (e.g. England, Finland, Germany and Ireland), this pattern is reversed for others (Spain, Switzerland, France and Hungary; 15).

**Figure 3: Concentration Indexes (measure of socio-economic inequality) for hazardous drinking\*.**

**Males**



**Females**



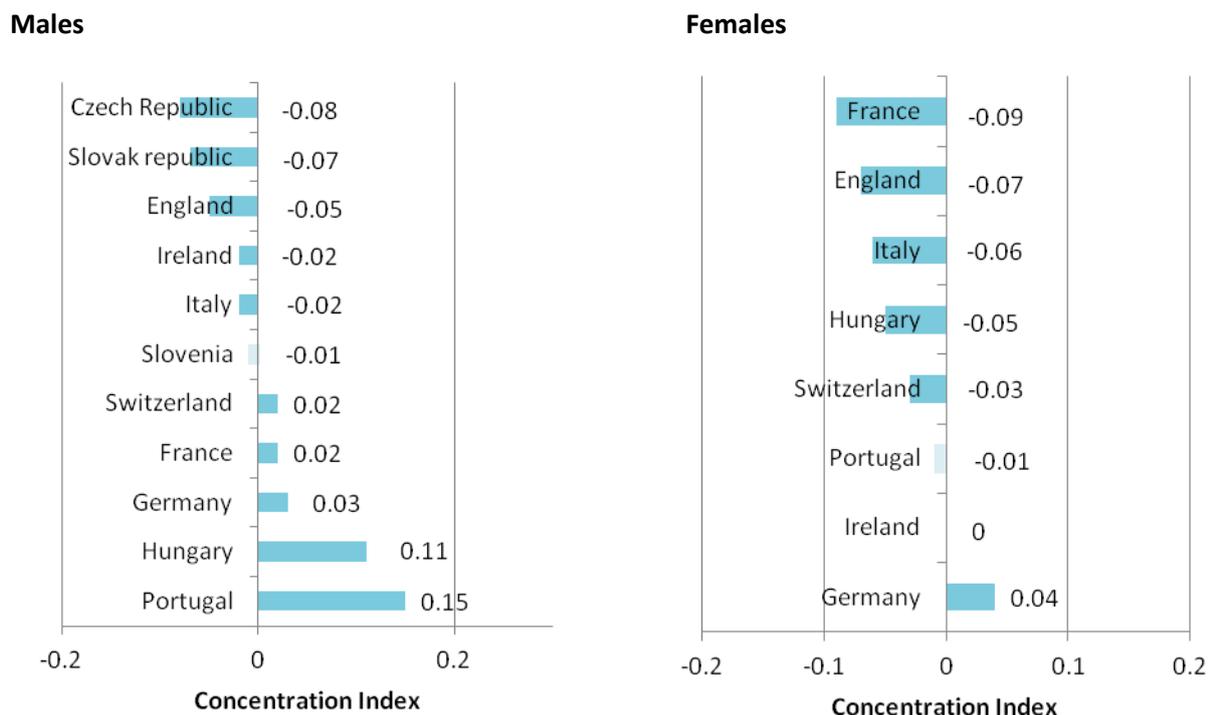
\*Adapted from OECD, 2015 (15). The Concentration Index (from -1 to 1) measures the size of inequalities for a given variable (here, hazardous drinking). A negative index indicates that people with lower SES are *less* likely to engage in hazardous drinking; a positive index indicates that people with lower SES are *more* likely to engage in hazardous drinking. The closer the concentration index is to 1 or -1, the larger the inequality; a concentration index of 0 means that there are no inequalities. All Concentration Indexes are statistically significant.

***Binge (heavy episodic) drinking***

Relationships between binge drinking and education/SES are less apparent. A review of binge drinking by the Organisation for Economic Co-operation and Development (OECD) found mixed patterns of education- and SES-related inequalities across eight EU countries for both men and women (15; Figure 4). Results from multi-national studies report that in general, across EU countries<sup>2</sup>, women and men with lower educational levels are more often binge drinkers than those with higher educational levels (15-18). However, differences are not always significant (particularly for women) and not all EU countries included in the studies follow this general pattern.

<sup>2</sup> EU countries included in these studies are: Sweden, Finland, Germany, Netherlands, Switzerland, Hungary, Czech Republic, Denmark, Estonia, Latvia and Lithuania.

**Figure 4: Concentration Indexes (measure of inequality) for binge (heavy episodic) drinking\*.**



\*Adapted from OECD, 2015 (15). The Concentration Index (from -1 to 1) measures the size of inequalities for a given variable (here, binge drinking). A negative index indicates that people with lower SES are *less* likely to engage in binge drinking; a positive index indicates that people with lower SES are *more* likely to engage in binge drinking. The closer the concentration index is to 1 or -1, the larger the inequality; a concentration index of 0 means that there are no inequalities. Darker blue bars indicate that the odds ratio is significant.

### *Underage drinking*

Socio-economic differences in alcohol consumption are also evident among young people aged 15 and 16 years. Data collected from the World Health Organization's *Health Behaviour in School-aged Children* (HBSC) study found significant relationships between family affluence and weekly alcohol consumption in 16 countries/regions for boys<sup>3</sup> and six for girls<sup>4</sup> (out of a total of 39 countries/regions in the WHO European Region [19]). For the majority of countries/regions, individuals with greater family affluence reported greater levels of weekly drinking amongst young people. Significant (mostly positive) associations were also found between family affluence and drunkenness (having ever been drunk on two or more occasions) amongst boys (in eight countries/regions<sup>5</sup>) and girls (in 12 countries/regions<sup>6</sup>). For most countries/regions, no significant associations were found between family affluence and getting drunk at age 13 or younger.

<sup>3</sup> EU countries were: Bulgaria, Greece, Czech Republic, Denmark, Austria, Belgium (French only), England, Croatia, Poland and Latvia.

<sup>4</sup> EU countries were: Bulgaria, Greece, Czech Republic, Belgium (French and Flemish) and Germany

<sup>5</sup> EU countries were: Denmark, Luxembourg, Portugal, Belgium (French only), Sweden and Lithuania

<sup>6</sup> EU countries were: Denmark, Bulgaria, Austria, Luxembourg, Belgium (French only), Italy, France and Lithuania.

### *Drinking in pregnancy*

Less information is available on the relationship between drinking in pregnancy and socio-economic status within the European Union. A systematic review of predictors of drinking in pregnancy (including four studies from Europe) concluded that high income/social class was a predictor of drinking in pregnancy in the majority of studies that examined this relationship (20). However, although unemployment and education level were examined in many studies, they were found to be predictors only occasionally (20). One study from the Netherlands reported higher levels of drinking in pregnancy among those with higher educational attainment (21).

## **Alcohol-related harms**

### *Alcohol-related problems*

Relationships between socio-economic status and alcohol-related problems (e.g. not being able to stop drinking once started; failed to do what was normally expected because of drinking; harmful effects of drinking on finances, work, relationships etc) have been examined using data from an international study (16,22). These analyses suggest that across a number of countries in the EU<sup>7</sup>, alcohol consumers of lower education are generally more likely to report alcohol-related problems than those of higher education, although inequalities are less significant for women than for men.

### *Alcohol-related mortality*

Higher rates of alcohol-related mortality have been reported among lower SES/education level groups in many EU countries. For instance, in one multi-national study, male and female rates of alcohol-related mortality were higher in lower educational groups for all 17 European countries/regions examined (23; data provided for EU countries in Table 1). Across EU countries, the ratio between mortality rates in the lowest and highest educational groups differed substantially, with the highest ratios found for countries in Eastern Europe (Poland, Czech Republic, Slovenia and Hungary) and the lowest ratios found for Belgium and England and Wales; Figure 5). Similar results have been reported in a meta-analysis of alcohol-related mortality, which included data from mainly European populations. Depending on the measure of SES examined, the risk of alcohol-related mortality for men in lower SES groups was found to be 3-10 times greater and for women 1.5-6 times greater than those in higher SES groups (24).

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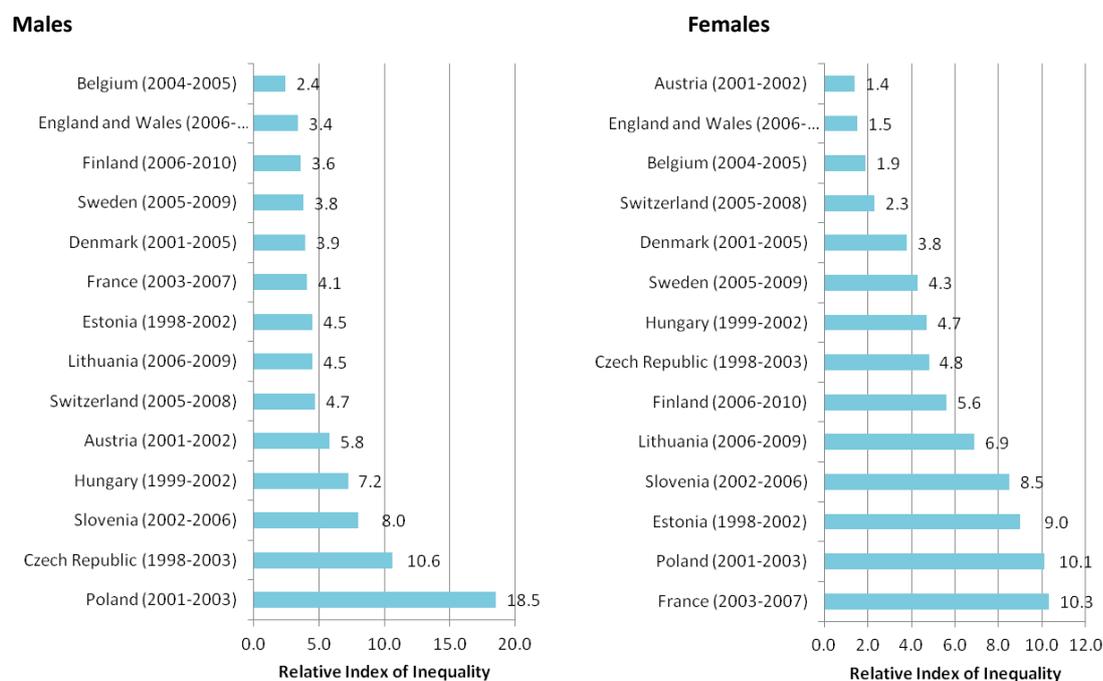
<sup>7</sup> Sweden, Finland, Hungary and Czech Republic

**Table 1: Age-standardised mortality rates for alcohol-related causes (per 100,000 person years) by low, mid and high education levels\*.**

Country	Years	Males - Education level			Females - Education level		
		Low	Mid	High	Low	Mid	High
Finland	2006-2010	<b>144.6</b> (139.3-150.5)	<b>106.0</b> (101.9-110.0)	<b>48.6</b> (45.4-51.5)	<b>50.0</b> (46.0-54.1)	<b>25.3</b> (23.4-27.3)	<b>13.8</b> (12.2-15.4)
Sweden	2005-2008	<b>35.4</b> (32.9-37.8)	<b>27.3</b> (25.8-29.0)	<b>10.1</b> (8.7-11.3)	<b>12.1</b> (10.7-13.8)	<b>7.5</b> (6.7-8.3)	<b>3.7</b> (3.0-4.5)
Denmark	2001-2005	<b>106.7</b> (102.3-110.8)	<b>69.3</b> (66.0-72.1)	<b>37.1</b> (33.8-40.6)	<b>36.5</b> (34.3-38.9)	<b>23.1</b> (21.1-25.2)	<b>15.4</b> (13.3-18.0)
England & Wales	2006-2009	<b>26.0</b> (19.6-32.6)	<b>16.5</b> (8.5-24.7)	<b>11.9</b> (5.8-19.0)	<b>12.0</b> (8.3-16.6)	<b>9.3</b> (4.3-14.8)	<b>9.8</b> (3.9-16.4)
Belgium	2004-2005	<b>32.0</b> (29.8-34.2)	<b>27.2</b> (24.0-30.1)	<b>16.9</b> (14.3-19.1)	<b>13.0</b> (11.9-14.1)	<b>13.2</b> (11.6-15.8)	<b>7.1</b> (5.3-9.0)
France	2003-2007	<b>57.5</b> (45.4-69.5)	<b>35.8</b> (28.0-44.4)	<b>16.3</b> (8.1-25.9)	<b>16.5</b> (11.7-22.4)	<b>7.8</b> (4.0-12.2)	<b>1.1</b> (0.0-3.4)
Austria	2001-2002	<b>37.4</b> (31.9-43.6)	<b>18.9</b> (16.5-21.3)	<b>6.2</b> (2.2-10.3)	<b>5.4</b> (3.9-7.1)	<b>5.6</b> (4.2-7.1)	<b>0.4</b> (0.0-1.1)
Slovenia	2002-2006	<b>133.9</b> (125.9-142.4)	<b>57.6</b> (53.5-62.2)	<b>24.7</b> (19.8-30.0)	<b>32.1</b> (28.7-35.7)	<b>12.9</b> (10.8-15.0)	<b>7.5</b> (4.3-10.9)
Hungary	1999-2002	<b>251.1</b> (247.5-255.1)	<b>119.6</b> (114.4-124.6)	<b>63.7</b> (59.7-67.7)	<b>65.0</b> (62.9-66.9)	<b>34.6</b> (32.5-36.8)	<b>21.6</b> (18.9-24.4)
Czech Republic	1998-2003	<b>45.4</b> (44.0-46.9)	<b>16.9</b> (15.7-18.0)	<b>9.8</b> (8.5-11.2)	<b>11.6</b> (10.9-12.4)	<b>5.6</b> (5.0-6.1)	<b>4.8</b> (3.6-6.0)
Poland	2001-2003	<b>53.3</b> (52.1-54.5)	<b>16.0</b> (15.0-17.1)	<b>7.4</b> (6.3-8.5)	<b>7.2</b> (6.6-7.7)	<b>2.9</b> (2.6-3.3)	<b>1.1</b> (0.7-1.5)
Lithuania	2006-2009	<b>205.7</b> (190.1-222.2)	<b>122.5</b> (117.0-128.4)	<b>51.0</b> (44.5-57.9)	<b>79.2</b> (67.5-91.9)	<b>40.3</b> (37.6-43.1)	<b>13.8</b> (10.7-16.5)
Estonia	1998-2002	<b>210.9</b> (194.4-226.5)	<b>130.9</b> (122.6-140.2)	<b>49.8</b> (41.1-58.1)	<b>91.1</b> (78.4-103.9)	<b>38.4</b> (34.4-42.3)	<b>10.5</b> (7.1-13.9)

\* Data from Mackenbach et al, 2015 (23).

**Figure 5: Age-adjusted educational inequality in mortality from alcohol-related causes (Relative Index of Inequality)**



\*Adapted from Mackenbach et al, 2015 (23). The Relative Index of Inequality is the ratio between mortality at the lowest and highest education levels. Higher ratios indicate greater inequality. For methodology, please refer to Mackenbach et al (23).

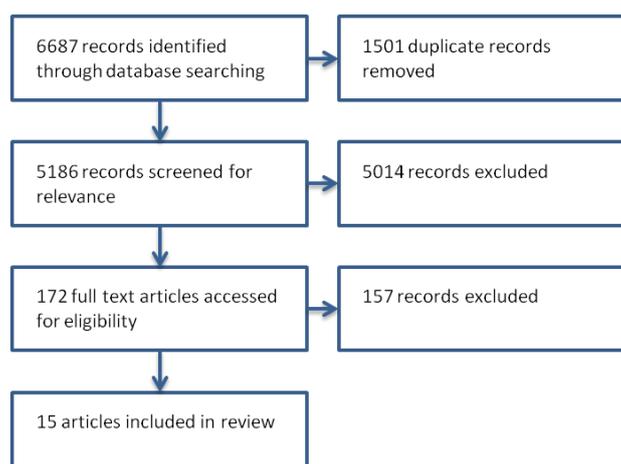
### Chapter 3: Interventions to reduce inequalities in harmful alcohol consumption and alcohol-related harm

There has been much written, both at a European level and worldwide, about the effectiveness of interventions and policy to prevent harmful alcohol consumption and related harms (25-27). Furthermore, a number of European and global action plans and strategies exist to encourage and guide their implementation (28-30). However, few interventions/policies have the specific aim of reducing socio-economic differences in alcohol consumption and harms, and correspondingly, few evaluations have considered the differential impacts of interventions/policies across socio-economic groups. This lack of evidence makes it difficult to ascertain which effective interventions/policies can help reduce inequalities in alcohol-related harms (or at least impact equally across socio-economic groups) and which may inadvertently increase the socio-economic gap. This Chapter of the report details the results of a systematic literature search for evaluations of alcohol-related interventions/policy in EU countries that compares outcomes by socio-economic group. Box 1 presents a summary of the methods.

#### Box 1: A summary of methods

A systematic search of the academic and grey literature was carried out to identify recent (2006 onwards) research on interventions/policies to reduce socio-economic inequalities in alcohol consumption and harm, specifically within EU countries. Academic searches were conducted within: Embase, Medline, PsycInfo, Cochrane, Cinahl and Scopus. Grey literature searches were conducted within: ETHOS, Open Grey, New York Academy of Medicine, NHS Evidence Search, World Health Organization, European Commission, European Centre for Disease Prevention and Control, European Monitoring Centre for Drugs and Drug Addiction, Eurofound, Organization for Economic Co-operation and Development and Government and Ministries of Health websites. To keep the search process manageable within the timeframes, searches were conducted in English only. Searches identified a total of 5,186 unique references (see flow diagram), which were sifted for inclusion according to title and abstract. Articles were included if they analysed or discussed the differential impact of alcohol-related interventions/policy by socio-economic group or proxy (e.g. education, income, occupational status) and were conducted within EU countries (the primary interest of the review was to ascertain action within EU countries only). Articles on interventions conducted within non-EU countries were therefore excluded.

#### Flow diagram of review process



The search identified 15 articles that considered the differential impact of interventions/policies on socio-economic groups within EU countries. The majority of these (9 articles) focused on controlling the availability of alcohol through pricing policies. The papers were generally split between 1) those focusing on a *reduction* in alcohol prices in Finland (31-35), and 2) those conducting modelling/forecasting studies that assessed the potential effects of introducing various pricing policies, largely from the UK (36-39). One paper focused on changes in outlet density (UK, 40). Three papers focused on screening to identify high risk drinkers and brief intervention (Sweden [41], Finland [42] and Spain [43]). An additional two studies examined the differential effects of education interventions (Sweden [44] and a multi-country study covering Austria, Belgium, Germany, Greece, Spain, Sweden and Italy [45]). In addition to these 15 articles, one systematic review was identified that focused on screening and brief intervention [46]. Four further reports were found within the grey literature that either considered possible interventions to address alcohol-related inequalities (47-49), or considered the cost effectiveness of various policy approaches in the European Union (25).

#### *Affordability: alcohol-pricing policies*

Alcohol-pricing policies attempt to control the price (and therefore affordability) of alcohol with the intention of reducing levels of alcohol consumption and associated harms. Taxation and pricing policies to increase the cost per unit of alcohol can impact on socio-economic inequalities by making alcohol less affordable for those on lower incomes, impacting specifically on heavier drinkers. Although pricing interventions to reduce harmful alcohol consumption and harms would focus on *increasing* the price of alcohol to reduce affordability, four studies from **Finland** focused on the impact of a *reduction* in alcohol prices in 2004 following the introduction of tax reductions to prevent the import of cheap alcohol<sup>8</sup>. These studies provide useful insight into how changes in pricing can affect different population groups within society. Although there were some mixed results, in general, these studies showed that reductions in the price of alcohol had most impact on harmful alcohol consumption and alcohol-related mortality in lower educational groups. However, there was less of an effect for alcohol-related hospitalisations or rates of interpersonal violence. For instance:

- For both men and women, **moderate-heavy drinking** increased most in lower educated groups (31). **Binge drinking** on the other hand increased in the lowest educational group for men, but in the middle/highest educational groups for women (31), reflecting gender differences in socio-economic inequalities in binge drinking reported earlier in this review.
- For those aged 30 and above, increases in **alcohol-related mortality** in the year following the changes were greatest among lower educational and social class categories, and among unemployed or pensioned individuals (32). For household income, although increases in alcohol-related mortality occurred for all income classifications, greater increases were

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<sup>8</sup> Tax reductions were made in Finland due to Estonia joining the EU in 2004. Tax reductions were made to avoid an increase in alcohol imports from Estonia, where the cost of alcohol was much lower, and to maintain the alcohol industry in Finland.

reported for those categorised into quintiles 3 (81.5% increase) and 4 (78.2% increase), compared with quintiles 1 (17.8% increase), 2 (61.2% increase) and 5 (48.4% increase; where 1 is the highest income and 5 the lowest). In other words, the effect of the price reduction was *not* greatest amongst the poorest households. One suggestion for this finding was that alcohol remained too expensive for the poorest persons in Finland, even after the price reductions (32).

- Increases in **alcohol-related hospitalisations** were reported for men with lower educational achievements compared to those with higher qualifications. However, no differences were reported for women (33).
- Some differences were reported for rates of **interpersonal violence**. Assault rates increased in areas that had higher levels of manual class workers and higher levels of basic education (although not significantly so), but no changes were reported for any other measures of socio-economic status (34).

Taking a longitudinal perspective over a 20 year period, a further study in **Finland** examined the relationship between the lowest prices of alcohol (set by state-owned alcohol outlets) and alcohol-related mortality between 1988 and 2007 (35). Whilst minimum prices did not significantly affect rates of alcohol-related mortality for men with middle or high levels of education, a 1% increase in the minimum price of alcohol was associated with a 0.03% reduction in alcohol-related mortality for men with low levels of education. Different patterns were reported for women. Here, there were no significant relationships between alcohol-related mortality and minimum prices of alcohol overall for any education group. However, when different beverage types were examined separately, increases in the lowest price of distilled spirits, strong beer and intermediate products<sup>9</sup> (but not wine or medium beer) led to reductions in alcohol-related mortality for women with middle levels of education only.

Taken together, these studies suggest that variations in the price of alcohol can often have more of an effect on alcohol consumption patterns and alcohol-related mortality in lower socio-economic groups, particularly among men. This suggests that, correspondingly, increases in price implemented through pricing policies have at least the potential for greater beneficial effects in lower socio-economic groups.

Additional evidence for the potential effectiveness of alcohol pricing policies is derived from studies measuring the potential impact of setting a minimum price per unit of alcohol sold or increasing tax on the sale of alcoholic beverages. Although there were no instances of where these measures had been implemented and evaluated in EU countries, two studies based in **England, UK**, modelled the potential effects of these strategies by socio-economic status, reporting a higher estimated impact in lower socio-economic groups. For instance:

- The potential effect of a £0.45 minimum unit price policy was evaluated across different socio-economic groups. Whilst there was an estimated reduction in levels of alcohol consumption amongst harmful drinkers in all socio-economic groups, decreases were greatest for those with the lowest incomes. Furthermore, the estimated reduction in

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<sup>9</sup> Defined by study authors as alcoholic beverages between 15 and 30% alcohol by volume.

alcohol-related mortality in harmful drinkers was six times greater for individuals in routine or manual households than it was for individuals in managerial or professional households (36).

- The impact of four different alcohol taxation and pricing policies on alcohol consumption and harm were modelled (37). These were:
  - *Current tax increase*: raising current alcohol duty for all beverages by 13.4%;
  - *Ad valorem tax*: an additional 4% alcohol-specific sales tax on product value after duty;
  - *Volumetric tax*: replace current excise duty with a duty of £0.22 per unit for all beverage types; and
  - *Minimum Unit Pricing*: setting a minimum price of £0.50 per unit within the current tax system.

Whilst all four policies had the potential to reduce health inequalities in terms of alcohol consumption and related harms, volumetric tax and minimum unit pricing had the greatest estimated ability to narrow the socio-economic gap (i.e. the ratio of percent change in alcohol-related deaths for routine/manual occupation deaths to percent change for professional/managerial occupation deaths was highest for these two policies; 37).

Two further **UK-based** studies examined which groups of the population would be most affected by minimum pricing policies by examining the relationship between alcohol purchases (including purchases of cheap alcohol) and household income (38,39). Although neither of these studies attempted to examine whether minimum pricing could narrow socio-economic inequalities in alcohol consumption and harms, they still provided some indication of how this policy may differentially affect different population groups.

The first study identified that regardless of socio-economic group, households that bought alcohol at a level categorised as harmful<sup>10</sup> were most likely to be affected by minimum unit pricing (38). Overall, low income households were less likely to purchase off-trade alcohol or cheap alcohol than higher income households and less likely to purchase at harmful levels. However, households that purchased harmful levels of alcohol *and* that fell into the lowest income category had the highest probability of buying cheap alcohol and thus would be most affected by minimum pricing policies. Similar conclusions were reported in the second study (39). Here, people on low incomes were less likely than all other individuals to buy cheap alcohol if they reported low-risk drinking<sup>11</sup> (OR 0.51), but more likely to buy cheap alcohol if they reported high-risk drinking (OR 1.29).

Although none of the articles identified included a cost effective element, the World Health Organization have estimated the costs, impact and cost-effectiveness of different pricing policies across three sub-regions of the WHO European Region (where sub-regions are based on levels of adult and child mortality). Increasing the tax on alcohol by 20% or 50% was estimated to be highly

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<sup>10</sup> The amount of alcohol purchased (both on trade and off trade) by each household was combined with the number of adults in the household and categorised as moderate, hazardous or harmful.

<sup>11</sup> Low risk drinking was defined as a score of <=4 on AUDIT-C; high-risk drinking was defined as a score of 5+.

cost-effective in all sub-regions of Europe, with estimated costs per DALY<sup>12</sup> saved ranging from \$335 to \$1272 (25).

#### *Availability: changes in outlet density*

Evidence suggests that reducing the availability of alcohol through restricting the density of alcohol outlets can be effective in reducing alcohol-related harm (25). With the most deprived neighbourhoods often having the highest density of alcohol outlets (50), regulating the level of alcohol outlets, particularly in deprived communities with high outlet densities, may help to reduce socio-economic inequalities in alcohol-related harms.

Only one paper was identified that focused on outlet density from a socio-economic perspective. In **Wales, UK**, changes in alcohol outlet density between 2006 and 2011 allowed for a natural experiment exploring subsequent impacts on alcohol-related harms across small population areas (40). Increases in outlet density were associated with small increases in alcohol consumption in the subsequent year and increased risk of emergency hospital admission for alcohol-related causes. Social deprivation was not found to modify these relationships, suggesting that changes in outlet density had similar effects across different levels of area deprivation. More research is needed on outlet density to a) better understand any differential impact on socio-economic groups associated with decreases in outlet density, and b) evaluate the impact of targeted interventions in areas of low deprivation.

#### *Screening and brief intervention*

Screening and brief intervention is often based in health care settings. It aims to identify harmful drinkers and provide them with a short feedback and motivational session to challenge and reduce harmful drinking practices. Screening and brief intervention is generally regarded as being an effective intervention to reduce alcohol consumption and harm among individuals drinking at harmful levels (25). Universal screening and brief intervention has the potential to reduce inequalities in alcohol-related morbidity and mortality by preventing alcohol-related health problems before their onset. Targeted screening and brief intervention in lower socio-economic groups, disproportionately affected by alcohol-related health problems may also be effective in addressing inequalities.

Three evaluations and one review of screening and brief intervention were identified through the systematic searches that provided a socio-economic perspective. All three evaluations examined differential effects on risky alcohol consumption showing mixed results. In two studies (one based in a large workplace in **Sweden** (41), and one based in primary and occupational health clinics in **Finland** (42), levels of risky/heavy drinking reduced at similar levels in both intervention and control groups. Furthermore, the interventions were equally effective across different population groups, such as manual and non-manual workers (41), or different employment statuses/educational levels (42). The third study, based in primary health care settings in **Spain** (43), examined the effects of

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<sup>12</sup> Disability-Adjusted Life Year. The WHO define a DALY as one lost year of “healthy” life and it is calculated as the sum of the years of life lost due to premature mortality in the population and the years lost due to disability for people living with alcohol-related conditions or consequences These include cancer, cardiovascular diseases other than ischemic heart disease, mental and neurological disorders, liver cirrhosis, unintentional injury and intentional injury.

either brief counselling or medical advice for patients who reported binge drinking patterns. Over a 12 month period, both groups reported similar reductions in harmful alcohol use. However, here, individuals with lower educational levels were at greater risk of continuing to drink at harmful levels at the end of the 12 month period. Thus, the intervention was more effective for people with higher levels of education. The authors highlighted a need to tailor treatment strategies to the education level of the target population.

Further information was provided by an international review of SES and screening/brief interventions (46). In line with the results reported in Sweden and Finland, the paper concluded that once recruited, SES did not appear to influence the outcome of brief interventions. However, there was not enough evidence to suggest whether SES could affect initial decisions to participate in and attend brief intervention sessions. Thus, even where interventions appear to equally affect population groups, socio-economic inequalities may still exist in access to and uptake of services initially; an issue that would require further exploration. The lack of studies and mixed results make it difficult to conclude whether screening and brief intervention has the ability to narrow the socio-economic gap in alcohol-related harms across society. However, targeting services most at lower socio-economic groups has the potential to disproportionately benefit these groups and could be explored further.

#### *School-based educational programmes*

School-based education programmes aim to increase knowledge of alcohol consumption among pupils and develop life and interpersonal skills. Most school-based programmes target pupils only, but some programmes incorporate parent modules. Although there are some instances of successful school-based educational programmes (particularly in altering pupil knowledge and attitudes), evidence from systematic reviews and meta-analyses suggests that across student populations as a whole they are not effective in reducing levels of alcohol-related harm (25). Estimating the overall impact of such programmes, however, has been hampered by poor quality trials (25).

We know little about the potential differential impacts of school-based programmes across different socio-economic groups, nor why education may impact differently across these groups. Our systematic search identified two EU studies focusing on school-based education programmes, one targeting students (skills-based) and the other targeting parents (focusing on attitudes). The student-focused intervention was a 12-session education programme aiming to address adolescents' alcohol, tobacco and illicit drug use (45). The programme focused on developing interpersonal and intrapersonal skills<sup>13</sup> and was implemented in seven countries in the EU (**Austria, Belgium, Germany, Greece, Spain, Sweden and Italy**). Here, participation in the programme was effective in decreasing the risk of reporting episodes of drunkenness (OR=0.60), intention to get drunk (OR=0.60) and alcohol-related problem behaviours (OR=0.70) among students attending schools in low socio-economic areas only. The programme was not effective for students in schools of medium or high socio-economic areas. A number of reasons were suggested for the variation in results. Programme content may have had more relevance for those in low socio-economic areas. Alternatively, students from deprived backgrounds and neighbourhoods, who may have less resources and support than

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<sup>13</sup> Language and thought used internally.

their more affluent peers, may have had more to gain from prevention programmes (45). The differential impact suggests an opportunity to address socio-economic inequalities in alcohol-related harm.

The parent-focused intervention (Strong and Clear) aimed to prevent alcohol consumption in adolescents and was based in secondary schools in **Sweden** (44). The programme was offered to parents of all 13-16 year olds and included parent meetings, family dialogues, friend meetings and family meetings across a three year period. Compared to those that chose not to take part in the programme, participation was associated with postponement of adolescent alcohol debut age and reduced rates of adolescent drunkenness. Equal reductions were reported across adolescents of different parental educational levels.

A lack of studies in the EU examining the differential impact of school-based educational programmes, along with mixed results, makes it difficult to draw conclusions on the ability of educational programmes to reduce socio-economic inequalities in alcohol consumption and harm. Whilst further evidence is required, results of the multi-country study focusing on the development of skills are encouraging and suggest that the targeting of school-based skill development programmes in more deprived communities may be worthy of further investigation.

## Chapter 4: The gaps in evidence

Our systematic searches identified four strategies evaluated in EU countries that focused on the differential impact of alcohol-related interventions across SES groups: pricing policies, restricting outlet density, screening and brief intervention, and school-based educational programmes. Three additional reports were identified, which discussed potential interventions to reduce socio-economic inequalities relating to alcohol use and harm (47-49). These reports recognise that taxation and pricing policies are one of the most effective ways to reduce socio-economic inequalities in alcohol-related harm. They also highlight the opportunities to intervene at different levels (e.g. national and sub-national socio economic context, vulnerability to alcohol-related harm, exposure to alcohol-related harm). Although research is scarce, other approaches are suggested in these reports, including (47-49):

- *Community mobilisation.* Mobilising community members and local organisations to identify and address local problems together can be effective in reducing harmful alcohol consumption and related problems (25). Community-led programmes developed in deprived communities with high levels of alcohol-related harm may help to reduce alcohol-related inequalities.
- *Increasing access to health and social services.* Socio-economic inequalities in health care access may help explain why individuals from disadvantaged groups experience greater harms from alcohol consumption. Increasing access to health services (e.g. through providing universal health care and removing the costs of accessing care, or targeting the needs of vulnerable groups such as the homeless), reducing the stigma of alcohol treatment (often a barrier to accessing care) could help to reduce inequalities in alcohol-related harm.
- *Increasing spending on social protection.* Individuals from higher SES groups are more likely to have social buffers that protect them from the harms of alcohol consumption. Social protection policies can help address this inequality, providing protection from the negative effects of unemployment and economic recession, and ensuring that all children have an equal start to life in terms of education and health care.

## Chapter 5: Summary and conclusions

Socio-economic inequalities in alcohol consumption and alcohol-related harms are reported within many EU countries. However, the magnitude and direction of these inequalities often differs between countries and regions and is likely affected by wider factors such as culture, religion and economics. Even within countries, the magnitude and direction of inequalities often differs between genders. In general, men and women with a lower SES or less education are less likely to be current drinkers and are more likely to abstain than those with higher SES/education. However, men and women with lower SES/education experience the highest rates of alcohol-related mortality, suggesting that when it is consumed, alcohol has more of an effect on health among individuals from lower SES/education groups. Patterns of heavy drinking, hazardous drinking and binge drinking by education status are less clear cut and differ by country and gender.

This review finds that in EU countries, most research on inequalities in alcohol has focused on alcohol pricing policies. Here, evidence suggests that increases in price through taxation and other pricing policies would be most beneficial to harmful drinkers in lower SES groups and would help to reduce socio-economic inequalities in alcohol-related harm. These strategies have been found to be

**Box 2: World Health Organization “best buys” for reducing harmful alcohol use**

1. Regulating commercial and public availability of alcohol
2. Restricting or banning alcohol advertising and promotions
3. Using pricing policies such as excise tax increases on alcoholic beverages

Source: World Health Organization: Global Action Plan for the prevention and control of noncommunicable diseases, 2013-2020 (51).

cost effective and form part of the WHO’s “best buys” for reducing harmful alcohol use (51; Box 2).

Although changes in outlet density, screening and brief interventions and education programmes have been evaluated with a socio-economic perspective, research is scant and it is difficult to draw conclusions around the ability of these programmes to reduce inequalities across society. Outlet density restrictions form part of the WHO’s “best buys” for reducing harmful alcohol use (reducing public availability of alcohol; 51; Box 2). Future research needs to explore the ability of outlet density restrictions, and other interventions affecting availability

such as reduced hours of sale, to reduce socio-economic inequalities in alcohol-related harm, either through universal or targeted implementation. International literature suggests that town planning to ensure that alcohol outlets are not disproportionately located within disadvantaged areas/ clustered too closely together has good potential to decrease inequalities in alcohol-related harm (52).

Additional research is also needed on any socio-economic differences in the uptake and attendance of screening and brief intervention for harmful alcohol consumption, to better understand its potential impact on inequalities. International research suggests that screening and brief intervention has weak to moderate potential to decrease inequalities in alcohol-related harm and that strategies must be put into place to ensure that disadvantaged populations are included in recruitment processes (52). Research on screening uptake within other fields (e.g. screening for

cancer) suggests that rates are lower among low socio-economic groups, and that barriers such as lower health literacy among these groups need to be addressed (53).

Despite the lack of overall effectiveness of school-based education programmes (25), it may also be useful to further explore the effectiveness of skills-based education programmes specifically within deprived communities. From a life-course approach, early life interventions that focus on developing life skills (54) and protecting against adverse childhood experiences such as child maltreatment (55), may have an important role to play in addressing alcohol-related inequalities, given links between stressful life experiences and later high-risk drinking (8,9). These broader interventions may go some way to reducing not only alcohol consumption in later life, but other health challenging behaviours such as smoking, excess weight and poor diet that are also associated with stressful life experiences (8,9) and appear to have an important role to play in explaining the alcohol harm paradox (6).

A further strategy highlighted in the WHO “best buys” (51) is restricting or banning alcohol advertising and promotions. No research was identified within the European literature that analysed this strategy from a socio-economic perspective. However, with greater television viewing and other screen-based entertainment reported among those with lower SES (56), there is potential for these individuals to have greater exposure to alcohol advertising than other SES groups (52). Future research could explore the ability of restrictions in alcohol advertising for both traditional and electronic forms of media to reduce inequalities in alcohol-related harm. Finally, additional interventions, such as community mobilisation, increasing access to health and social services, and increasing spending on social protection, may also have potential in reducing alcohol-related inequalities and may be worthy of future research within the EU.

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## Glossary of frequently used terms

**Heavy drinking:** Drinking over recommended daily/weekly limits.

**Harmful use of alcohol:** A pattern of alcohol use that causes damage to physical or mental health, while often also having negative social consequences (World Health Organization definition)

**Hazardous use of drinking:** A pattern of alcohol use that increases the risk of harmful consequences for the user (World Health Organization definition).

**Binge (heavy episodic) drinking:** Drinking at least 60 grams or more of pure alcohol on at least one occasion in the past 30 days (World Health Organization definition).

**Alcohol-related morbidity/mortality:** Health conditions/deaths for which alcohol is a contributory factor.