The contribution of alcohol to life expectancy differentials across countries and over time in Europe

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Abstract

Background: Both alcohol-attributable mortality and life expectancies largely differ across European countries. While alcohol-attributable mortality tends to be higher in Eastern European countries than in Western Europe, life expectancies are lower. Similarly, alcohol-attributable mortality trends and life expectancy trends are diverse in Europe, and especially across Eastern European countries. We estimate the contribution of alcohol to life expectancy differentials between Eastern European countries and Western Europe since 1990.

Data and methods: All-cause mortality (Human Mortality Database) and alcohol-attributable mortality data (GBD Study 2013) were retrieved by age and sex for 25 European countries, which were divided into Eastern or Western countries. Traditional life tables and life expectancy decomposition techniques were applied to assess the contribution of alcohol to life expectancy differentials between each Eastern European country and Western Europe.

Results: In 2010, alcohol was explaining around 1/4 of the differentials in life expectancy between Western Europe and Russia, Belarus and Ukraine, for both men and women. In other countries the contribution of alcohol was lower, but quite important among men in 2010 with around 1/5 in Hungary, Lithuania, Estonia and Poland. In most of the countries the relative contribution of alcohol seems not to have declined in the period 1990-2010, although a declining trend is observed after 2005.

Discussion: In conclusion, a relatively large share (above 20% in 5 countries for men and 3 countries for women in 2010) of the gap in mortality between Eastern and Western European countries seems to be explained by alcohol consumption. Therefore, we show that important life expectancy differentials could be narrowed be reducing alcohol-attributable mortality across Europe.

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Introduction

Alcohol-attributable mortality in Europe

Both alcohol prevalence (average consumption and patterns of drinking) and alcohol-related mortality largely differs across European countries, even between countries within a region (Popova et al. 2007; Rehm et al. 2007). In particular country differences in alcohol-attributable mortality are also well-known within Central and Eastern European countries, where alcohol-attributable mortality was estimated to be the highest in the world (WHO 2014). For example, the proportion of premature men deaths due to alcohol in 2002 was lower in Poland (13.6%) and in the Czech Republic (16.3%) than in Hungary (25.2%) and in Lithuania (22.8%) (Rehm et al. 2007). In addition, alcohol-attributable mortality trends have also followed different patterns. In Southern European countries it has been systematically declining over the last two decades, and it has been stagnating in most of other Western European countries. The situation has been much different in Eastern European countries since the dissolution of the URSS with successive increasing and declining in most, but not in all, Eastern European countries.

Several studies have compared alcohol-attributable mortality rates across European countries (Rehm et al. 2007; Kraus et al. 2015), but only few studies have gone one step further assessing the impact of alcohol in life expectancy, mostly in Finland (Mäkelä 1998; Martikainen et al. 2014). Life expectancy at age 25 could have increased by 2.1 years among men and 0.6 years among women if alcohol was eliminated (2003-2007) (Martikainen et al. 2014).

Life expectancy differentials across Europe

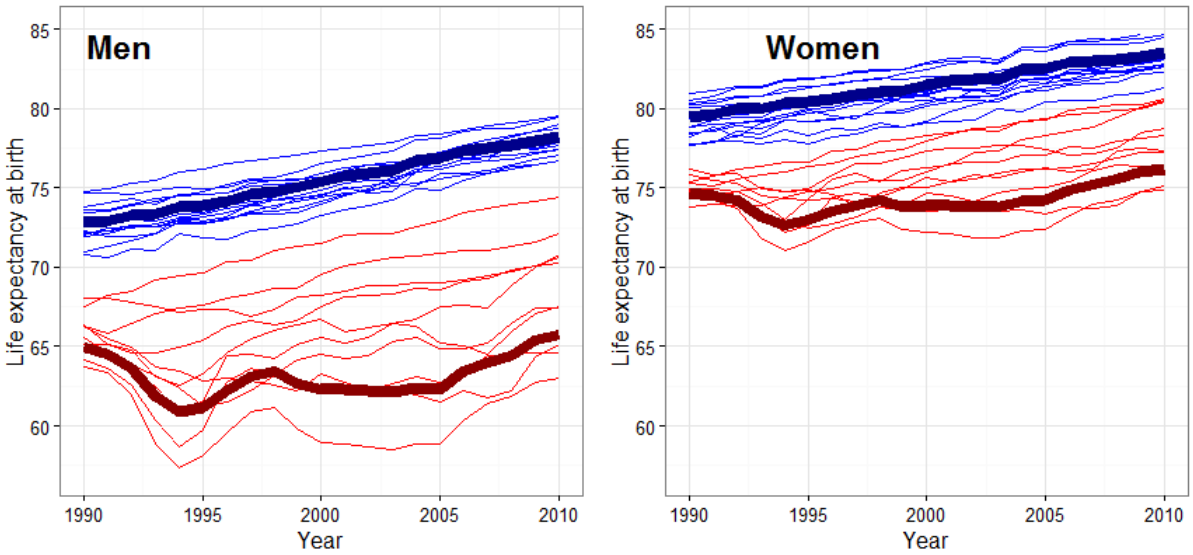
Alcohol has been commonly postulated as one of the important determinants of East-West mortality and life expectancy differentials in Europe (Meslé 2004; Meslé and Vallin 2002). According to their life expectancies European countries can be broadly divided in two groups. The group with higher life expectancy comprised the countries included in the broad definition of Western European countries: Mediterranean, Nordic and Western countries (Mackenbach et al. 2013). Male life expectancy was ranging in 2010 between 77 and 80 years, without clear sub-regional differences. All Central and Eastern European countries have lower life expectancy, ranging between 63 and 74 years (Figure 1).

The contribution of alcohol to life expectancy differentials

Although Eastern European countries have both higher mortality (lower life expectancy) and higher alcohol-attributable mortality than Western European countries, the assessment of the contribution of alcohol to life expectancy differentials across European countries and over time has received little attention. By decomposing life expectancy into a broad group causes

of death various studies suggested an important impact of alcohol in life expectancy between Eastern European countries and other countries in Europe (e.g. Meslé et al. 2002; Karanikolos et al. 2012). In addition, alcohol has been also postulated to explain life expectancy differentials over time. By assessing cause-specific mortality trends in Russia, Shkolnikov and colleagues concluded that alcohol has been a an important determinant of life expectancy trends in Russia (Shkolnikov et al. 1998; 2001), and in Lithuania and Belarus (Grigoriev et al. 2010). In some countries and periods of time the contribution of alcohol has been estimated to be rather important. For example, 0.8 years of gain in life expectancy between 2007 and 2009 in both Estonia and Lithuania are explained by alcohol (Jasilionis et al. 2011).

Figure 1. Life expectancy trends in Western (EU-15) (blue) and Eastern (red) European countries, 1990-2010.



a. Bold lines illustrates the weighted average for each region
Source: Own elaboration using HMD data

Aim

This paper aims to examine the actual contribution of alcohol to life expectancy differentials between Eastern European countries and Western Europe since 1990.

Data and Methods

Settings

European countries were classified into Western (EU-15) or Eastern (Belarus, Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Russia and Ukraine), according to a commonly used definition (Mackenbach et al. 2013). As life expectancy in Eastern

European countries followed similar patterns before the URSS dissolution we set up 1990 (one year prior the URSS dissolution) as starting year.

Data

Age-, and sex-specific alcohol-attributable mortality data for years 1990, 1995, 2000, 2005 and 2010 were retrieved from the Global Burden of Disease (GBD) for 25 European countries. GBD estimates of alcohol-attributable mortality were calculated using a comparative risk assessment (CRA), with non-drinkers as counterfactual group. GBD used distributions of alcohol consumption (by age, sex, year and country) modeled using total consumption per capita and survey data (patterns of drinking) in DisMod-MR; and relative risks from various meta-analysis (Forouzanfar et al. 2015). Although the accuracy of modelled alcohol distributions may be argued for some countries, and overall CRA approaches are highly dependent on alcohol prevalence data and relative risks, the GBD estimates have the advantages of accounting for total alcohol-attributable mortality as compared to approaches solely using mortality by cause of death

All-cause mortality data for the corresponding countries and years was retrieved from Human Mortality Database.

Methods

Life expectancies at birth for men and women were estimated using traditional life table techniques (Preston et al. 2010). Inter-country differentials (Western Europe compared to each Eastern European country) in life expectancy at birth were estimated using HMD data, while the contribution of alcohol to life expectancy differentials was estimated using alcohol-attributable mortality data (GBD) by means of standard life expectancy decomposition techniques (Andreev et al. 2002).

Results

The relative contribution of alcohol in life expectancy differentials was greater for men than for women. Belarus, Russia and Hungary showed the largest share of the contribution of alcohol to life expectancy differentials with Western Europe in 2010 for both men and women. For example, this contribution was about 25% in Belarus and Russia for men, while it reached 30% in Belarus among women.

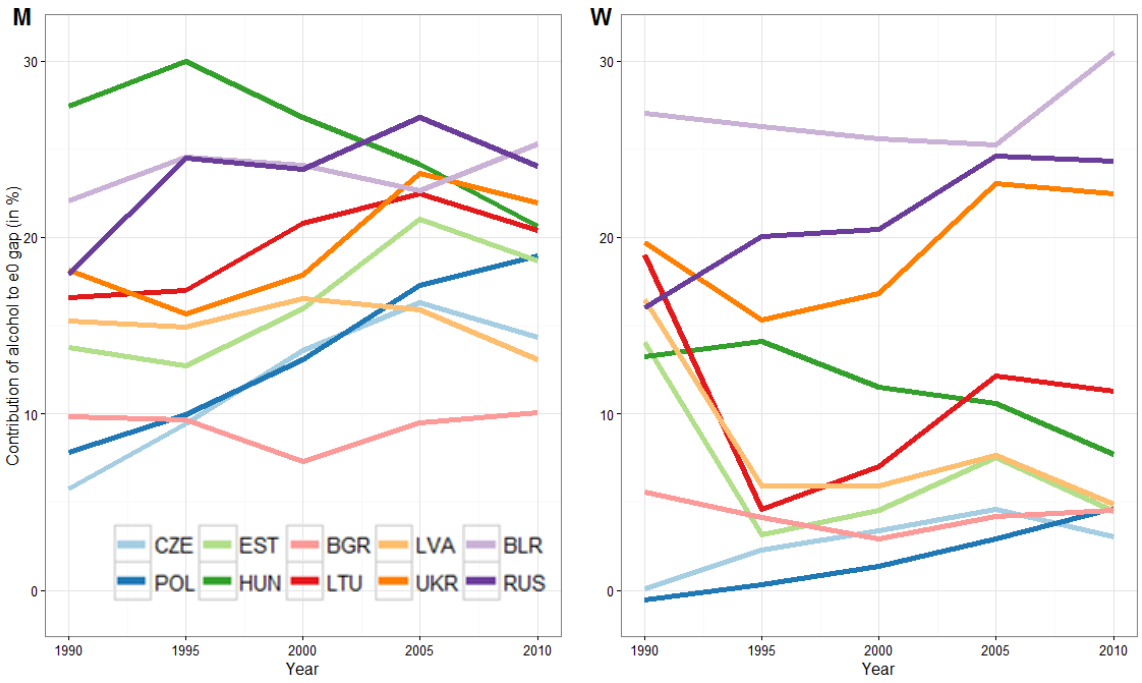
For both men and women the relative contribution of alcohol has clearly increased between 1995 and 2005 (except for Hungary, Latvia and Bulgaria) (Figure 2).

Discussion

This study have quantified the contribution of alcohol to life expectancy differentials between Eastern European countries and Western Europe since 1990.

Alcohol alone was estimated to explain more than 20% of the differentials in life expectancy between Western Europe and Russia, Belarus and Ukraine, for both men and women. This relative contribution corresponds to 3-4 years among men and around 2 years among women, and it seems not to have declined since 1990. In other countries the contribution of alcohol is lower, but quite important among men in 2010 with around 20% in Hungary, Lithuania, Estonia and Poland. This gap seems not to have declined over time, especially for men. Further steps in this research will (1) incorporate different alcohol-related mortality estimates to confirm the robustness of these findings, and (2) include recent years to examine whether the contribution of alcohol to the life expectancy gap has continued to narrow.

Figure 2. The relative contribution of alcohol to life expectancy gap between Eastern European countries and Western Europe (1990-2010)



a. M and W refers to men and women, respectively.
Source: Own elaboration using data from HMD and from the GBD 2013 study.

In conclusion, a relatively large share of the gap in mortality between Eastern and Western European countries (above 20% in 5 countries for men and 3 countries for women in 2010) was explained by alcohol consumption. Alcohol contribution seems more important in 2005 than in earlier periods. This paper is the first one to quantify the contribution of alcohol-attributable mortality to life expectancy differentials across Europe, and it shows that large alcohol is a key element to reduce disparities in life expectancy across Europe.

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