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Alcohol Consumption Analysis

Moldova versus other countries

Introduction

On 11th February 2011 the World Health Organization (WHO) published the [Global Status Report on Alcohol and Health 2011](#) and earlier on 5th January 2011 they published the [European Status Report on Alcohol and Health 2010](#). Since then on a lot of websites circulated the idea that Moldova is worldwide No.1 drinking country with an average consumption of 18.2 litres of pure alcohol per person per year. After reading some comments, mostly expressing deeply the injustice of WHO towards Moldovan people, I decided to download both reports and have a closer look at the data and see what's hidden behind this number.

How much is 18.2 litres of pure alcohol?

First of all I want to make clear what means 18.2 litres of pure alcohol in more common terms as beer, wine and spirits. According to WHO the following guideline is used for the conversion into litres of pure alcohol: 5% for beer, 12% for wine and 40% for spirits.

So 1 l of pure alcohol corresponds to 20 l beer or 8.33 l wine or 2.5 l spirits. Using multiplication we obtain the following amount of drinks per Moldovan person per year: 364 l beer or 152.7 l wine or 45.5 l spirits. Divide by 52 and we get the corresponding amount per week: 7 l beer or 2.92 l wine or 0.875 l spirits. In order to top up to this amount if you are Moldovan you have to drink weekly about 14 beers or 4 bottles of wine (they usually are 0.75 l) or 17.5 shots of spirits (50 ml).

Health agencies of various governments have different maximum alcohol intake recommendations. In UK, for instance, the maximum recommended weekly amount for men is 210ml of pure alcohol, and 140ml for women. This is equivalent of about 10 beers for men or 7 beers for women. Thus, Moldovans are exceeding British safety level by roughly a third.

Ok, we admit it: we do drink a lot, but let's see how the situation in other countries is, particularly neighbouring countries Romania, Ukraine and Russia and Europe as a whole.

WHO data sources and methodology

Both reports use data provided by Global Information System on Alcohol and Health ([GISAH](#)). GISAH is “the portal to the Global Alcohol Database (GAD) which WHO has been building since 1997 through the compilation of information from published and grey literature, government documents, national statistics, national and global surveys, the industry, intergovernmental organizations, and data collection through the Global Survey on Alcohol and Health. Currently, GISAH encompasses more than 200 alcohol-related indicators in more than 225 countries and territories.” (Global Status Report on Alcohol and Health 2011)

Here is an extract from the *European Status Report on Alcohol and Health 2010* about the methodology and data sources:

“This report is based on the European Survey on Alcohol and Health that was a part of the Global Survey on Alcohol and Health. The survey was sent to all Member States in July 2008. In addition to the data collected, other sources of data were utilized in the preparation of this report and the country profiles. These included surveys and other studies conducted in the respective countries, mainly from published peer-reviewed journal articles and official reports, and in some cases grey literature such as conference papers and reports found on the internet. For the data on alcohol consumption, several sources were utilized. Official data on recorded adult (15+) per capita consumption (APC) supplied by the respective member states were given a priority. If these data were not available, data from alcohol industry statistics in the public domain were used. In some cases, when these data were either not consistently available or not reliable, data supplied by the Food and Agriculture Organization of the United Nations’ statistical database (FAOSTAT) were utilized.”

Furthermore an extract from *International Guide for Monitoring Alcohol Consumption and Related Harm*:

“Surveys of drinking behaviour are a key component of national monitoring systems. By estimating rates of abstinence in different population sub-groups and proportions of alcohol consumed from unrecorded sources they are an invaluable adjunct to sales, production and/or taxation data as a means for estimating per capita consumption.”

The *Global Survey on Alcohol and Health* had a response rate of 84% of WHO Member States (162 out of 193) and an overall global coverage of 97% of world’s population.

Below is listing of possible errors a survey may encounter:

1. **Sampling error**, caused by observing a sample instead of the whole population. It depends on the sample size, being inversely proportional to the square root of the sample size. It is of interest also the **margin error** which is expressing the amount of random sampling error in a survey's results. When estimating a proportion p , surveys and opinion polls generally follow a simplified guideline for the sample size: $n=100 \Leftrightarrow \epsilon \sim 10\%$, $n=400 \Leftrightarrow \epsilon \sim 5\%$, $n=1000 \Leftrightarrow \epsilon \sim 3\%$ and when $n=10000 \Leftrightarrow \epsilon = 1\%$. Thus the true proportion may be ± 0.1 , ± 0.05 , ± 0.03 , ± 0.01 accordingly (in a perfect survey that would include all the representative groups of the target population).
2. **Coverage error**, it arises when not all the representative groups of the target population are included in the survey: one example in Moldova is the population that works abroad and can't be included in the surveys. It's an important issue as mostly this is the younger working population.
3. **Measurement error**, the respondents didn't understand the question, or used other measure than a standard unit reporting the alcohol consumption didn't recall precisely the amount.

4. **Processing error**, transferring the information from paper to a programme in the computer, data coding, data analysis is tedious work also prone to error;

5. **Non-response error**, it's very common for the selected participants admitted to a survey to quit or to refuse or to be unable to answer some questions, and the final sample may be non-representative.

I didn't find any document entitled *Global Survey on Alcohol and Health* on WHO website, but I found the general WHO guideline to surveys: [World Health Survey](#).

According to it the acceptable sample size of the survey is 5000. Also WHO indicates that they rely only on the **probability sampling design** which means that every single individual in the sampling frame has a known and non-zero chance of being selected into the survey sample and the sampling frame should cover 100% of the eligible population in the surveyed country. Since WHO accounts for non-response, the final sample must be at least 5,000 respondents.

So the sampling error is minimised by observing a large enough sample; the processing error is probably avoided by assigning more than one person to process the same data and by cross-checking; the non-response error is taken into account. It remains the coverage error and the measuring error. I don't see how WHO reached the large number of people involved in labour migration, taking into account that the larger part is staying illegally abroad (The results of social researches and the population census in 2004 testify that about 600,000 people are involved in labour migration process, practically each 3rd able-bodied country - http://www.icps.com.ua/files/articles/50/33/Migration_ENG.pdf). And about the measurement error: even if the surveyors make easy to understand and answer questions and agree in advance about the measuring unit of the drinks, still most of the people would find difficult to report precisely the alcohol consumption.

On ec.europa.eu - European Commission website I found a document regarding the survey about alcohol conducted by WHO: [Global Survey on Alcohol and Health and Global Information System on Alcohol and Health](#).

For more survey-related information about sampling, survey questions, bias, error, examples, please consult the [International Guide for Monitoring Alcohol Consumption and Related Harm](#) published by WHO in 2000.

Unfortunately we don't know how and who conducted the survey in Moldova. On [Moldova's](#) profile on WHO there is no information regarding this. I contacted them by mail, but I am still waiting for an answer.

Indicators of alcohol consumption, patterns and consequences

WHO uses several key indicators for describing country profiles: types of beverages, consumption of recorded and unrecorded alcohol per capita (APC), average alcohol consumption among drinkers, abstainers (lifetime and former drinkers), alcohol use disorders and dependence, fatal road accidents, patterns of drinking. The following definitions and methods of estimation are provided by Global Information System on Alcohol and Health (GISAH).

Total APC = recorded + unrecorded alcohol consumption / total adult population (15+ years)

Recorded APC = recorded alcohol consumption / total adult population (15+ years)

Recorded APC only takes into account the consumption which is recorded from production, import, export, and sales data often via taxation. In order to make the conversion into litres of pure alcohol, the alcohol content of beer, wine, and spirits is considered to be 5%, 12% and 40% respectively. Specific conversion factors are used for other, less common types of alcoholic beverages. However, since the data sources may use different conversion factors to estimate alcohol content, the beverage-specific recorded APC may not equal the total provided, in some cases.

Unrecorded APC = unrecorded alcohol consumption / total adult population (15+ years)

Unrecorded consumption refers to alcohol which is not taxed and is outside the usual system of governmental control, such as home or informally produced alcohol (legal or illegal), smuggled alcohol, or alcohol obtained through cross-border shopping (which is recorded in a different jurisdiction). Survey questions on consumption of unrecorded alcohol are converted into estimates per year of unrecorded APC. Usually surveys underestimate consumption. However, in countries where survey based estimates exceeded the recorded consumption, unrecorded was calculated as total consumption estimated from survey minus recorded APC. In some countries, unrecorded is estimated based on confiscated alcohol confiscated by customs or police.

Alcohol consumption per drinker = recorded + unrecorded alcohol consumption / (total adult population (15+ years) - abstainers – former drinkers)

Abstainers (lifetime) = adults (15+ years) participating in the survey who have never consumed alcohol / the total number of participants (15+ years) participating in the survey

Former drinkers = adults (15+ years) that participating in the survey who did not consume alcohol in the last 12 months, but who did previously / the total number of participants (15+ years) participating in the survey

Estimating abstention rates: in this report, best estimates for abstention rates in 2004 are presented for 131 WHO Member States, based on surveys carried out within the time period 1993–2009.

Alcohol use disorders = adults (15-64 years) participating in the survey that experienced an alcohol disorder / adult population (15-64 years) participating in the survey

Using the algorithms specified in the validated instruments, presence or absence of harmful use of alcohol or alcohol dependence can be determined. AUD will be scored if either disease category is present. Estimation is from the Global Burden of Disease estimates.

Alcohol dependence = adults (18-64 years) in 2004 who were dependent on alcohol / adult population (18-64 years)

Estimation is from the Global Burden of Disease estimates.

Fatal road traffic accidents = 100 000 * (number of alcohol-related road traffic accidents sold in death/ adult population (15+ years))

Estimation is from WHO Mortality Database, based on data as reported by countries.

Here is an extract from *Global Status Report on Alcohol and Health 2011* about the pattern of drinking:

“**Patterns of drinking score** reflect *how* people drink instead of *how much* they drink. Strongly associated with the alcohol-attributable burden of disease of a country, PDS is measured on a scale from 1 (least risky pattern of drinking) to 5 (most risky pattern of drinking).

Estimating PDS: the PDS is based on an array of drinking attributes, which are weighted differentially in order to provide the PDS on a scale from 1 to 5:

- The usual quantity of alcohol consumed per occasion;
- Festive drinking;
- Proportion of drinking events, when drinkers get drunk;
- Proportion of drinkers, who drink daily or nearly daily;
- Drinking with meals;
- Drinking in public places.

Data for 2005 on the above measures stem from survey information. There are only a few countries in the world with the lowest patterns of drinking scores, or the least risky patterns of drinking. These countries in southern and Western Europe have high adult per capita consumption. High patterns of drinking scores, or the most risky patterns of drinking, prevail in Kazakhstan, Mexico, the Russian Federation, South Africa and Ukraine.”

Visualising data

From both reports I extracted some indicators regarding the alcohol consumption, patterns and consequences for Moldova, Romania, Ukraine, Russia and Europe and I placed them in a table for comparison.

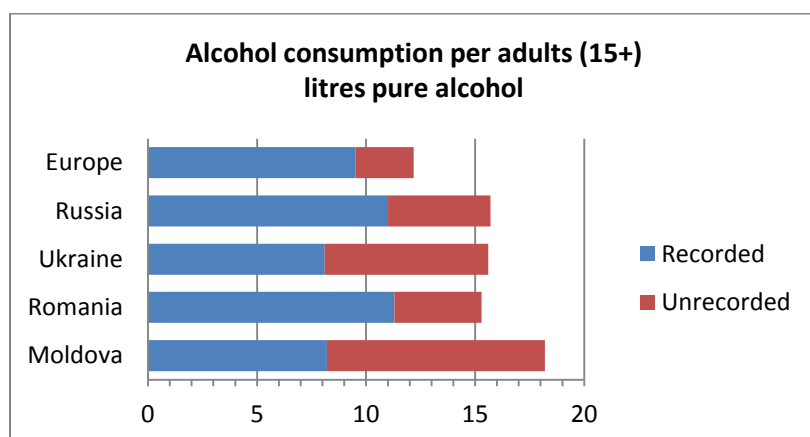
Index 2003-2005		Moldova	Romania	Ukraine	Russia	Europe
Average per adult (15+) (litres pure alcohol)	Recorded	8.2	11.3	8.1	11.0	9.51
	Unrecorded	10.0	4.0	7.5	4.7	2.67
	Total	18.2	15.3	15.6	15.7	12.18
Average per adult drinker (15+) (litres pure alcohol)	Males	32.04	31.75	37.38	35.38	-
	Females	13.57	15.02	17.07	16.32	-
	Total	23.39	24.48	27.91	26.71	-
Lifetime adult abstainers (15+) (%)	Males	5.5	6.5	14.4	10.7	12.6
	Females	17.8	19.1	31.0	28.6	24.6
	Total	12.1	13.1	23.6	21.0	18.9
Former adult drinkers (15+) (%)	Males	7.5	15.6	18.3	18.3	11.0
	Females	12.2	32.5	22.4	22.0	13.5
	Total	10.0	24.4	20.5	20.0	12.3
Alcohol use disorders 2004 (15-64 years, %)	Males	14.08	5.45	8.63	16.29	9.17
	Females	2.15	1.29	0.69	2.58	2.0
	Total	-	-	-	-	5.63
Alcohol dependence 2004 (18-65 years, %)	Males	-	-	9.6	17.6	-
	Females	-	-	1.0	3.2	-
	Total	2.2 ¹	-	-	-	-
Alcohol-related fatal road traffic accidents 2004 (15+ , per 100000)	Males	29.3	20.1	32.2	52.5	~17.0 ²
	Females	6.5	5.6	8.4	15.6	~4.5
	Total	-	-	-	-	-
Pattern of drinking		4	3	5	5	1, 2, 3
1=least risky 2 3 4 5=most risky						
Alcoholic beverages %	Spirits	33	39	32	63	34.6
	Wine	36	39	7	1	26.4
	Beer	31	22	61	33	37.1
	Other			<1	3	2.5

1. The proportion is calculated using the data from National Bureau of Statistics Moldova and it represents only the proportion of patients being under observation or first time taken under observation. The actual proportion may be higher.

2. This numbers are an approximate average based on European countries with very low child and adult mortality rate: Austria, France, UK, Switzerland, Israel, Ireland, Croatia, Czech Republic, Finland, Sweden, Norway, Netherland, Germany, Slovenia, Spain, Greece, etc.

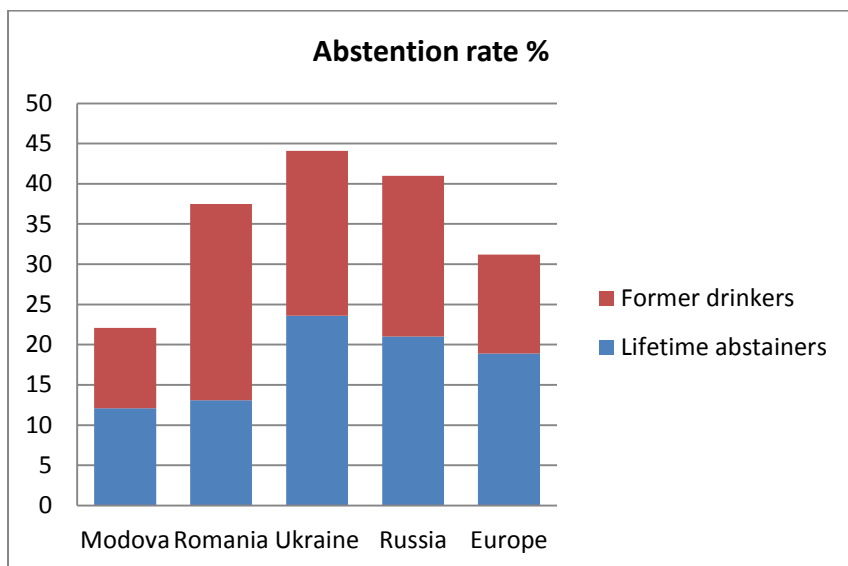
3. Note: "total" is a weighted average between "males" and "females" accordingly to their proportions in the total adult population.

A table is better than a whole 381 pages report, but still it's difficult to assess the situation at a glance. So I will introduce some graphs.



Here is Moldova - proud No 1 at alcohol consumption per capita in the whole wide world, but let's see how do we rank among drinkers. What total alcohol consumption per capita (APC) means? APC is obtained by summing the entire amount of alcohol (recorded and unrecorded) consumed in a country during a year and divided by total adult population (15+ years).

But not every adult drinks, there is a proportion of persons that don't use alcohol at all (lifetime abstainers) and then there is the proportion of adults who used to drink in the past, but because of different reasons did not drink in the last year (former drinkers). Here is a chart with the abstention rate:



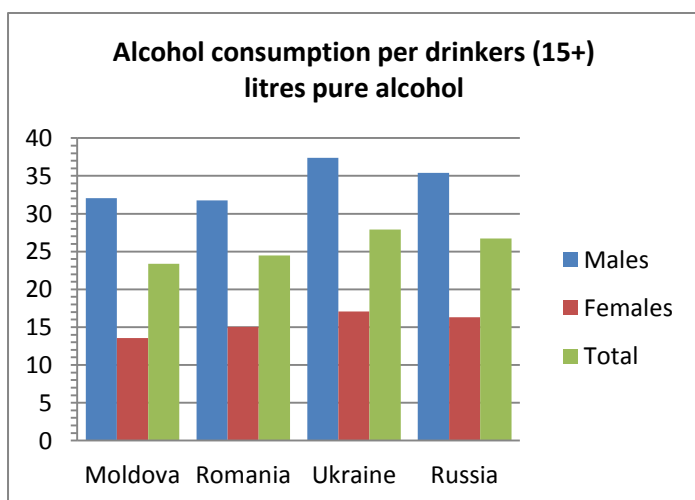
You can clearly see that Moldova has the lowest rate of abstainers.

I will introduce an observation from Global Status Report on Alcohol and Health:

“Lifetime abstention is the opposite of per capita consumption. In countries with high APC, there are fewer lifetime abstainers compared to countries with low APC. This suggests that WHO regions with the highest per capita consumption commonly found in the European Region or other developed areas, do not necessarily have the highest consumption per drinker. Often, per drinker consumption is particularly high in countries with moderate or even low APC combined with high abstention rates. In such countries, the relatively smaller percentage of the population that drinks is consuming alcohol at high levels.”

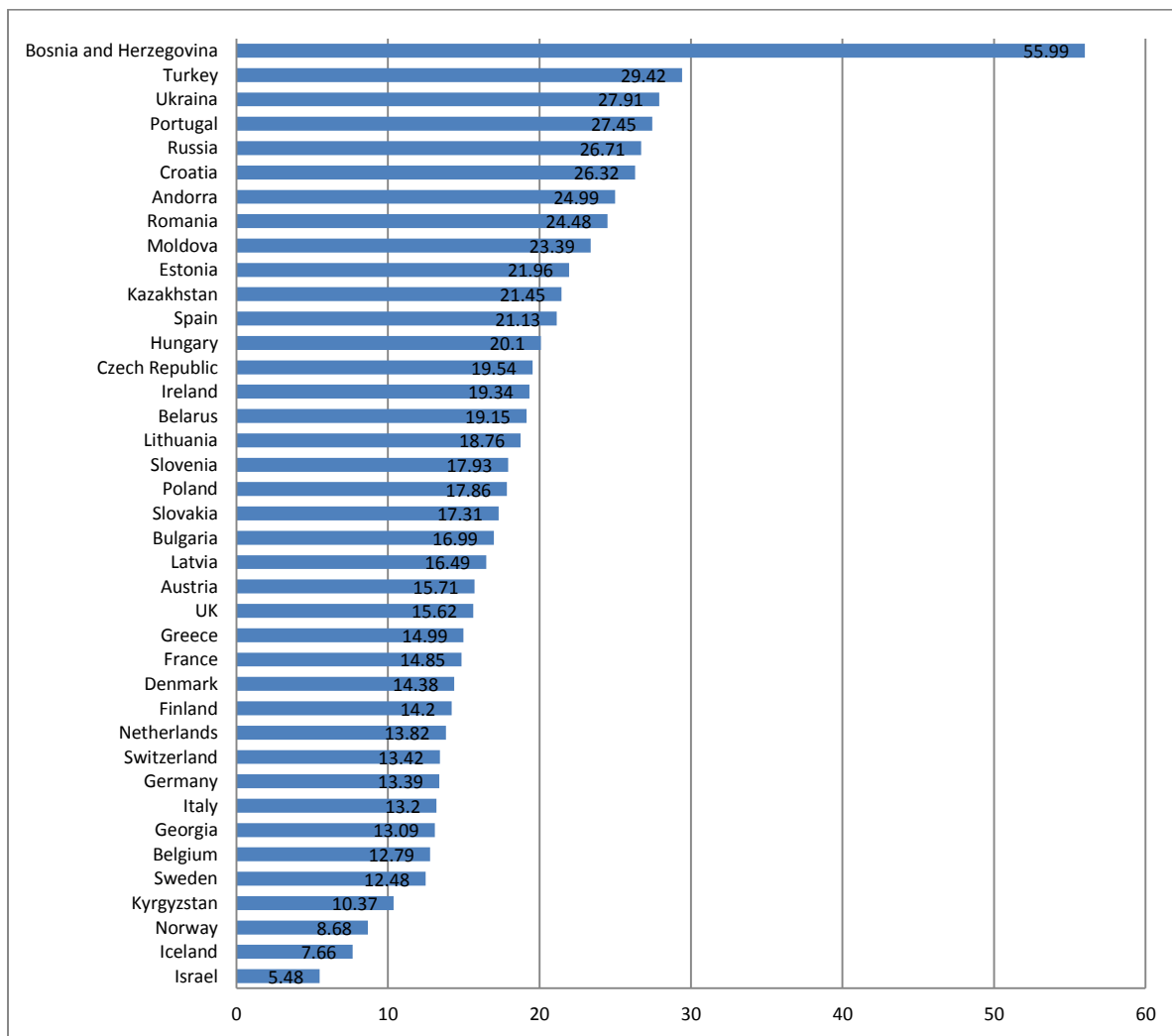
In order to make a better estimate of alcohol consumption you have to extract the population that doesn't drink at all or didn't drink for the last year from the total population and you get the total population who drinks. And then you divide the total alcohol consumption over a year to the total population who drinks and you get the average consumption per drinker.

Below is the chart of alcohol consumption per drinking capita:



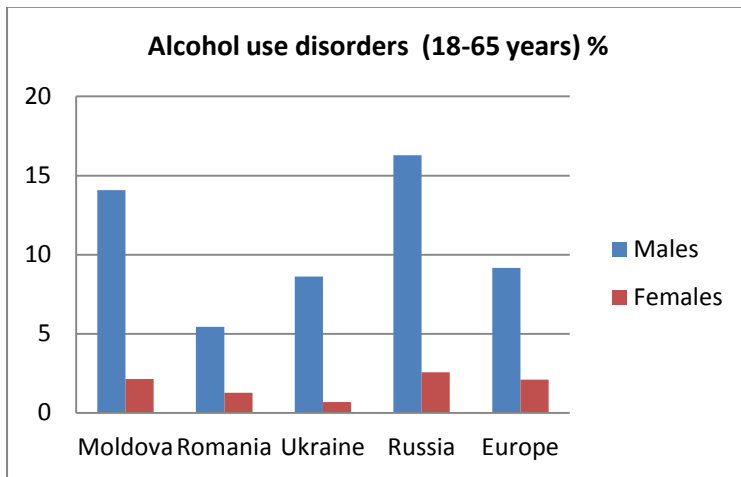
Note that Russians drink more than Moldovans, and so do Romanians and Ukrainians. That is hardly a reason to celebrate, as we aren't far behind.

After reading the reports I collected the data about alcohol consumption among drinkers in 39 European countries. And on the following graph you can see the distribution of alcohol consumption per capita among drinkers in the European countries.

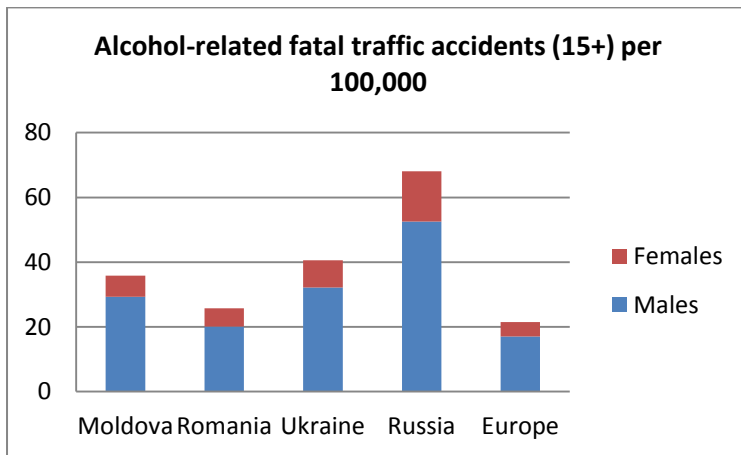


Only Bosnia and Herzegovina, Turkey, Ukraine, Portugal, Russia, Croatia, Andorra and Romania drink more than Moldova. The drinking score per capita among drinkers vary from as little as 5.48 litres pure alcohol in Israel to 55.99 litres in Bosnia and Herzegovina (this value is unusually high even comparing to second larger score Turkey with 29.42 and I think it requires further investigation). Moldova is No 9 in this top with an average intake per year of 23.39 litres of pure alcohol per capita; it's still a lot of alcohol, but it is of some consolation that we are lower in the top comparing to Russians and Ukrainians.

Now let's see where Moldovans rank when talking about consequences:

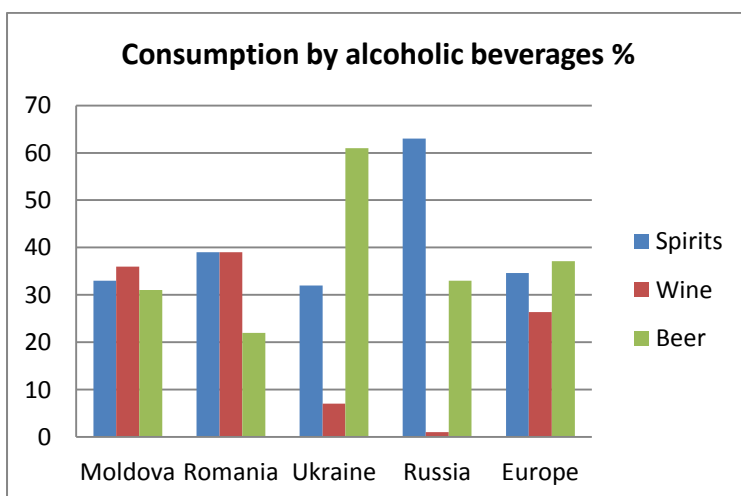


We have a very high proportion of persons with some alcohol-use disorders, particularly among men, but still Russia is higher in the top.



In terms of number of alcohol-related road traffic accidents per 100,000 population Moldova has a higher rate than Romania and Europe but much lower than Russia.

And finally let's see what Moldovans, Romanians, Ukrainians, Russian and Europeans like to drink.



Moldovans nearly equally drink wine, beer and spirits. Europeans drink a little bit less wine, Romanian less beer, whereas Ukrainians and Russians don't like the wine at all and drink much more beer (Ukraine) and spirits (Russia).

In conclusion,

YES, Moldovans do drink a lot, more than most of Europeans, however less than Russians or Ukrainians and in a less harmful way.