ECRONICON OPEN ACCESS

EC PHARMACOLOGY AND TOXICOLOGY

Research Article

Comparative Analysis of Risk Factors for the Burden of Alcoholism in Men in 160 Countries of the World 2004

Ludmila Alexandrovna Radkevich* and Dariya Andreyevna Radkevich

Center for Theoretical Problems of Physicochemical Pharmacology of the Russian Academy of Sciences, Moscow, Russia

***Corresponding Author:** Ludmila Alexandrovna Radkevich, Center for Theoretical Problems of Physicochemical Pharmacology of the Russian Academy of Sciences, Moscow, Russia.

Received: March 28, 2022; **Published:** February 09, 2023

Abstract

Objective: To investigate the prevalence of alcoholism, the levels of alcohol consumption, some comorbid diseases, and the gender difference in life expectancy (LE) in 160 countries 2004.

Materials and Methods: Study design: Statistical analysis of observations.

Using the Mann-Whitney U test, risk factors for the burden of alcoholism, levels of alcohol consumption, and the gender difference LE of women and men in 160 countries were studied.

Findings: The study found that the burden of alcoholism was 23 times higher in group 8 compared to group 1 in 160 countries in 2004. The main risk factor for alcoholism in men is not the total consumption of alcoholic beverages.

A statistically significant risk factor for alcoholism is the level of strong alcohol consumption. The gender difference in LE between women and men is statistically significantly higher in countries with a high burden of alcoholism. The popular belief about the same life expectancy of teetotalers and alcoholics cannot be considered true without taking into account the gender difference LE.

Conclusion: A risk factor for alcoholism is the level of strong alcohol consumption to a greater extent than the total consumption of wine, beer and strong alcohol. Gender difference LE depends not only on alcoholism. Risk factors for alcoholism and the gender difference in LE require further study.

Keywords: *Wine; Beer; Strong Alcohol; Doses; The Burden of Alcoholism; Liver Cancer; Liver Cirrhosis; LE; Gender Difference*

Abbreviations

AB: Alcoholic Beverage; AP: Animal Products; BMI: Body Mass Index; BP: Blood Pressure; CAB: Alcoholic Beverage Consumption; CD: Communicable Maternal, Perinatal Diseases; Cho: Blood Cholesterol; CL: Consumption Level of Selected Foods; CHD: Coronary Heart Disease; CV: Cereals and Vegetables; CVD: Cardiovascular Diseases; COPD: Chronic Obstructive Pulmonary Disease; D: Disease; DALY: The Disability-Adjusted Life Year; DRD2 and DRD3: Genes Encode Type 2 and 3 Dopamine Receptors; EEI: Ecological Efficiency Index; FAO: Food and Agriculture Organization of the United Nations; FS: Fruits and Sweeteners; ICD-10: Codes - Is the 10th Revision of the Interna-

tional Statistical Classification of Diseases; GBD: Global Burden Diseases; GDP: Domestic Gross Product; Glu: Blood Glucose; HPI: Happiness Index; IHD: Index of Human Development; LE: Life Expectancy for Men and Women; LPA: Low Physical Activity, LMA: Linear Multiple Regression Analysis; M: Male; NS: Nutritional Structure; MSP: Metabolic Syndrome Predictors; NCD: Non-Communicable Diseases; P: Person; QOL: Quality of Life; QR: Quartile Range; R1: Multiple Correlation Coefficient; R2: Coefficient of Determination; RE: Rating Educations; SNP: SNP Market - Online Store of Electronics and Equipment; SLC6A4: Encodes a Sodium-Dependent Transmembrane Transporter a Neurotransmitter Serotonin Reuptake Protein; TDC: Total Daily Consumption; UN: United Nations; UV: Ultraviolet Level; WHO: World Health Organization

Introduction

Alcohol abuse is the third largest risk factor for disease and disability in the world. The liver is the main organ responsible for the metabolism of ethanol. Acetaldehyde-acetate, fatty acid ethanol esters, ethanol-protein adducts are considered hepatotoxins [1]. The positive effects of alcohol have been questioned due to the lack of a safe drinking threshold. A J-curve of low to moderate alcohol consumption is associated with less risk than abstaining from drinking. Drinkers have the highest risk [2]. The analysis showed that the presence of any of the alcohol use disorders and major depression doubles the risk of a second disorder [3]. Long-term alcohol consumption shortens the onset of heart disease, stroke, cancer, and cirrhosis of the liver. Environmental factors and certain genes affect the risk of these disorders, and reduce alcohol sensitivity [4]. Although severe alcohol withdrawal syndrome is associated with significant morbidity and mortality, most patients at risk will not develop this syndrome [5]. Side effects of benzodiazepines have been reported in 15% of alcohol dependence treatment [6]. The discovery of the mechanisms of biological, mental and other risk factors for alcohol use are important for the development of prevention and treatment of alcohol use disorders [7]. The discovery of direct-acting antivirals has brought alcoholic liver disease back into prime time. Information about ethnic, cultural and genetic factors is relevant for the population of Latin America [8]. The negative effects of alcohol on susceptibility to infections and on lung barrier function are well documented. Alcoholic lung represents a comorbidity of the negative consequences of COVID-19 susceptibility [9]. Excessive alcohol consumption not only negatively affects diabetes. But it also affects the course of diabetes [10]. A greater percentage of relatives with alcoholism, male sex, and higher impulsivity were associated with a higher frequency of overeating [11]. Polymorphisms in the genes encoding fucosyltransferase 2 double the risk of developing alcohol-associated chronic pancreatitis [12]. Excessive consumption of ethanol affects any organ. Cytokines are generated both by activation of Kupffer cells and by the direct metabolic action of ethanol [13,14]. Evidence supporting genetic factors in alcoholism comes from family and twin studies [15,16]. A search is underway for genetically determined risk factors for alcoholism. Decreased brain response to moderate doses of ethanol was found [17]. Relative risk estimates were found when cases of alcohol dependence were excluded and when the focus was on alcoholic psychosis or alcoholic diseases of the stomach, liver, and pancreas [18]. Alcohol-related mortality accounts for over 10% of all deaths in the EU.

New EU members had higher alcohol-related mortality (135.0 ± 18.48 vs 88.9 ± 18.93; $t = -8.55$ ($df = 46$), $p < 0.001$). Multivariate regression analysis showed that alcohol-related mortality and alcohol consumption are negatively associated with the gross national product of EU countries [19].

The popular saying says that "teetotalers and alcoholics live the same way, but average drinkers live longer turned out to be close to the truth". However, the truth is in the details. Despite many years of research, the folk omen has not been fully confirmed or refuted.

Objective of the Study

To investigate the prevalence of alcoholism, the levels of alcohol consumption, some comorbid diseases, and the gender difference in life expectancy (LE) in 160 countries 2004.

Materials and Methods

Study design: Statistical analysis of observations.

For the purposes of the study, a database of 160 countries on the burden of alcoholism, cancer and cirrhosis of the liver (ICD-10 codes) was created. Burden of disease (DALY) data for men in 160 countries, standardized by sex and age, were selected from the 2004 GBD database [20].

160 countries were divided into 8 groups of 20 countries in each group. The burden of alcoholism increased from group 1 to group 8 (List of countries).

To characterize the "quality of life" (QOL) in countries, a number of indicators were used: income per capita in 2000 - 2016. (US dollars per person per year [21]; geographical position of countries by latitude and level of ultraviolet radiation in the capital (UV) (J/m^2 2004) [22]; Life expectancy for men and women (LE) [23] and [Internet resources]; access to good health care, clean water and clean air [24]; Happiness Indices (HI), Gini; prosperity; education; personal capital; Corruption; peacefulness; Human Development; Environmental efficiency [25] and [Internet resources].

Body mass index (BMI) ≥ 25 kg/m^2 and ≥ 30 kg/m^2 have been studied as predictors of metabolic syndrome (MSP) - the percentage of men and women in the country who are overweight and obese; the % of population with blood cholesterol (Chol ≥ 5.0 mmol/L and ≥ 6.2 mmol/L); blood glucose level (Glu ≥ 7.0 mmol/L); blood pressure (BP ≥ 140/90 mm Hg); low physical activity (LPA) ≤ 60 min/day walking [26].

The daily level of food consumption (TDC) (g/person/day) (50 types of products) for each country was selected from the FAO database for 1992 - 2005 [27]. The nutritional structure (NS) of the countries is presented in the form of 4 blocks in absolute and percentage terms (TDC): 1 - products of animal origin (AP); 2 - cereals and vegetables (CV); 3 - fruits and sweeteners (FS); 4 - alcoholic beverages (AB) [27]. Statistical analysis of the study results was performed using Mann-Whitney-Wilcoxon U-criterion. U is the numerical value of the Mann-Whitney test. The central tendency in the sample data distribution was represented by the median with a quartile range and a mean with a standard deviation. The variance of the data in the samples was estimated using a quartile range (QR) between the first and third quartiles, that is, between the 25^{th} and 75^{th} percentiles. The level of statistical significance, reflecting the degree of confidence in the conclusion about the differences in the indicators of groups 1 and 2 countries: two levels of accuracy were estimated: (1) $p \leq 0.01$, 1% error probability; (2) $p \leq 0.05$, 5% error probability. The Bonferroni correction was also used to assess the significance of the study results, taking into account the two hypotheses $p \leq 0.025$ for multiple comparisons.

All calculations were carried out using the STATISTICA program (version 13).

Results

An analysis of the burden of alcoholism in 160 countries 2004

The median gradient in the burden of alcoholism in 2004 was minimal in three group 1 countries: Samoa (5 DALis), Libyan (9 DALis) and Kuwait (10 DALis), respectively. The maximum burden of alcoholism was noted in 3 countries of the 8^{th} group: Republic of Moldova (2020 DALis), Hungary (2204 DALys) and Russian Federation (2430 DALys), respectively. Hungary (2204 DALys) and Russian Federation (2430 DALys), respectively.

The median gradient in the burden of alcoholism across 8 groups of 160 countries represents an exponent. The median characteristics of the burden of alcoholism are statistically significantly different in each of the 7 groups of countries from the 8^{th} group of countries ($p \leq 0.001$).

The trend line of alcoholism is steadily increasing from the 1st group of countries to the 8th group (Table 1 and figure 1).

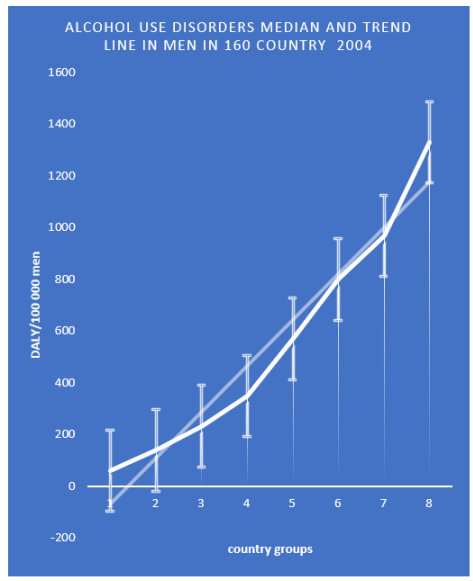

Figure 1: *Burden alcohol use disorders median and trend line in men in 160 country 2004 y.*

The median burden of liver cirrhosis was statistically significantly higher in group 8 compared to groups 1 to 7 (p = 0.001) (Table 1 and figure 2). The trend line for the burden of cirrhosis indicated an exponential increase in incidence, similar to alcoholism.

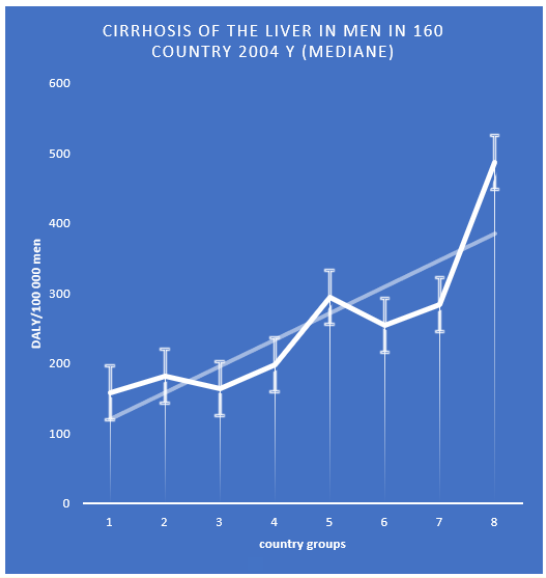

Figure 2: *Burden of cirrhosis of the liver in 158 countries in 2004 in men (DALY, Median).*

The median burden of liver cancer was statistically significantly different from country group 8 in country groups 1 and 3: (p = 0.023; 0.008). The burden of liver cancer was 3 times higher in group 1 than in group 8. The liver cancer burden trend line indicated a decrease in the liver cancer incidence gradient (Table 1).

The median burden of hepatitis B and C was statistically significantly different from group 8 in almost all country groups (p = 0.001). The burden of viral hepatitis was the highest in group 3 (20 DALYs), the lowest in group 8 (2 DALYs) (Table 1 and figure 3). The viral hepatitis B and C trend line indicated a decrease in the burden of hepatitis from group 1 to group 8 countries.

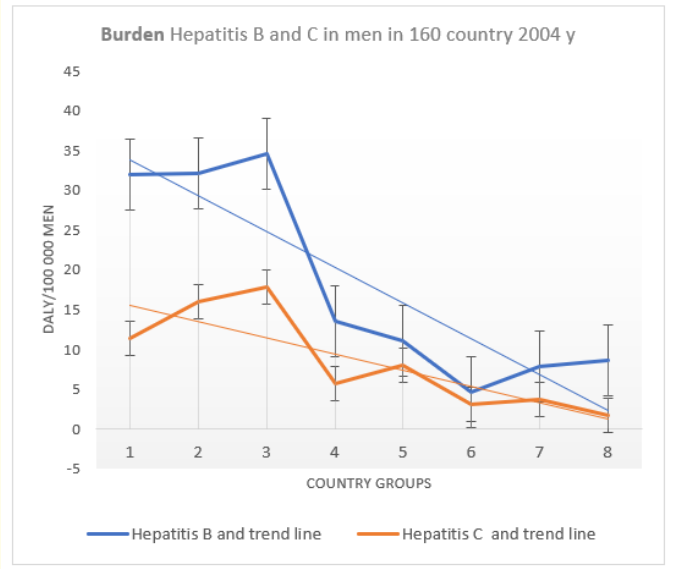

Figure 3: *Burden hepatitis B and C in mrn in 160 country 2004 y (median).*

Metabolic syndrome

Body mass index (BMI ≥ 30 kg/m^2) indicated a 3-fold increase in the proportion of obese men from group 1 (8%) to group 6 (23%). In groups 7 and 8, the proportion of obese men fell to (18%) and (19%), respectively.

The trend line of the body mass index gradient indicated an upward trend from group 1 to group 8. The median characteristics of body mass index (BMI ≥ 30 kg/m^2) from groups 1 to 7 compared with group 8 countries had variable statistical significance. Statistically significant differences were noted in groups 2, 3 and 5 of countries from group 8 of countries: (P = 0.001; 0.002; 0.04). respectively (Table 1).

Analysis of the quality of life in 160 countries of the world 2004

Per capita income increased from group 1 to group 7. In groups 1, 2 and 3, income was statistically significantly lower than in group 8 (p = 0.02; 0.004; 0.001), respectively. In 4, 5, 6 and 7 groups of countries, the income did not differ statistically significantly from the 8th group of countries.

However, income in the 8th group of countries was 1.4 times lower than in the 6th and 7th groups of countries (Table 1). The income trend line in the 8 groups was increasing (Figure 4).

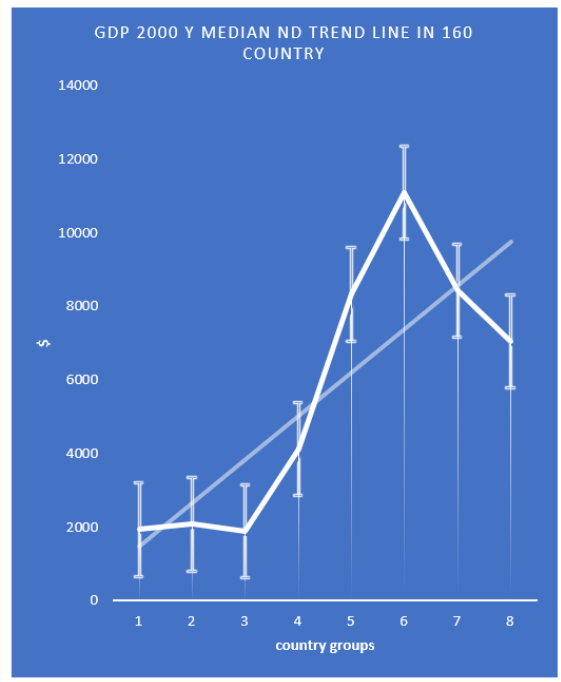

Figure 4: *Per capita income (GDP) in 160 countries in 2000 for men ($/year, Median).*

The geographic location gradient (Latitude and ultraviolet) of the burden of alcoholism was directed from the southern latitudes to the northern latitudes (Table 1). Ultraviolet (j/m^2) in the capitals of countries in 2004 was statistically significantly higher in groups 1, 2 and 3 compared to group 8 (p = 0.0008; 0.0193; 0.0016).

In the 6th and 7th groups of countries, the ultraviolet did not differ statistically significantly from the 8th group of countries (Table 1). The trend line was directed towards the decrease in the level of ultraviolet, that is, to the northern latitudes (Table 1).

Social indicators (Gini coefficient, happiness index, prosperity index, education index, social capital index, human development index, environmental efficiency index, corruption index, peacefulness index, access to health care, clean water and clean air) were generally lower in low-income countries (1 - 3 group of countries) (Table 1).

From the 4th to the 7th groups of countries, social characteristics did not statistically significantly differ from the 8th group of countries (Table 1).

Median life expectancy for women increased from group 1 to group 6 from 65 years to 79 years and was statistically significant in groups 1 - 3 (p = 0.034; 0.0006; 0.0004). In groups 7 and 8, women's life expectancy fell to 77 and 76, respectively. The trend line was increasing (Table 1).

Median life expectancy for men increased from group 1 to group 6 from 61 years to 74 years. In groups 7 and 8 of countries, life expectancy for men decreased to 71 years and 68 years: Statistically significant differences from group 8 of countries occurred in groups 2, 3, 6 and 7 (p = 0.0248; 0.0014; 0.0020; 0.0385*), respectively (Table 1).

The median gender difference in life expectancy between women and men in 2000 was increasing and statistically significant from groups 1 to 7 compared to group 8: (p = 0.0002; 0.0000; 0.0000; 0.0049; 0.0090; 0.0315*; 0.0167), respectively.

Median expected gender gap increased exponentially from group 1 to group 8 from 4 years to 7 years (Table 1 and figure 5). The minimum gender difference (2 years) was in Kuwait, Niger and Guinea. The maximum gender difference (12 years) was noted in Ukraine and Belarus and (14 years) in Russian F.

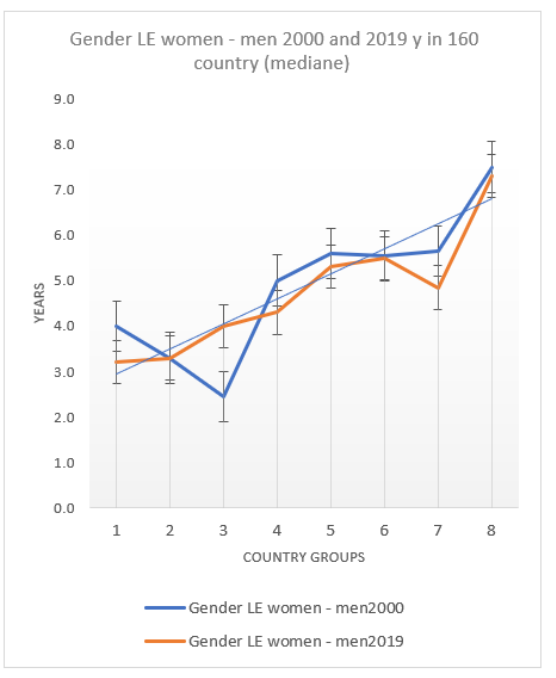

Figure 5: *Gender LE women - men 2000 and 2019 y in 160 country (median).*

It turned out that with the life expectancy of women in the 6th group of countries of 79 years and men of 74 years, the gender difference is 5.5 years. But in the 8th group of countries, with a life expectancy for women of 76 years and men of 68 years, the gender difference is 8 years.

By 2019, median life expectancy for women in group 1 increased by 9 years (p = 0.022). In the 8th group of countries, the life expectancy of women increased by 2 years and was statistically significantly different from the 1st group of countries (p = 0.022).

By 2019, median life expectancy for men in group 1 countries has increased by 8 years. In group 8 of countries, life expectancy for men increased by 2 years and did not differ statistically significantly from 1 country, similarly to 2000 (Table 1).

Median expected gender difference in life expectancy between women and men in 2019 was statistically significantly different from group 1 to group 7 compared to group 8 (p = 0.002). The trend line was rising. Moreover, in group 1 of countries, the gender difference decreased by 1 year. In the 8th group of countries, it remained the same and was statistically significant (p = 0.001) differed from group 1 countries. Thus, the gender difference between groups 1 and 8 increased by 1 year from 2000 to 2019. However, in the Russian Federation, the gender difference has decreased from 14 years in 2000 to 11.4 years by 2019 (Table 1).

Analysis of food and nutrient intake levels in 8 country groups

The overall level of food consumption in the 1st, 2nd and 3rd groups of countries was statistically significantly lower than the 8th group of countries. In 4, 5, 6 and 7 groups of countries, the overall level of consumption did not differ statistically significantly from group 8. The trend line for total consumption was increasing from group 1 to group 8.

The minimum level of consumption was in the 1st group of countries and amounted to 869 g/person/day. In the 6th group of countries, the total level of food consumption was 2095 g/person/day. In group 8, the total consumption level decreased to 1738 g/person/day: (p = 0.0031; 0.0028; 0.0003; 0.2; 0.3; 0.06; 0.5) (Table 1).

The general level of energy ((kcal/person/day 1990-05) was statistically significantly different in groups 5 and 6 of countries from group 8. The trend line was ascending from group 1 to group 8. However, the minimum level of total energy was in group 3 - 2335 (kcal/person/day) The maximum level of energy is noted in the 6th group of countries 3270 (kcal/person/day).

In the 8th group, the overall level of energy did not differ statistically from the 1st group of countries and amounted to 2865 (kcal/person/day) (Table 1).

The energy level of animal products ranged from 7% (group 2 countries) to 26% (group 6 countries) of the total energy in the country groups. In the 7th and 8th group of countries, the share of Energy from animal products was lower than in the 6th group and amounted to 21% and 23%, respectively. But the differences were not statistically significant.

The animal food energy trend line was increasing from 1 to 8 country groups (Table 1).

Analysis of levels of consumption of alcoholic beverages in countries

Strong alcohol consumption levels were statistically significantly higher in 6 country groups out of 7 groups, except group 6 compared to group 8: (p = 0.00000; 0.0000; 0.0000; 0.0002; 0.0256; 0.6; 0.0200) (Table 1). The consumption increase gradient increased exponentially from 0.000 g/person/day up to 15.000 g/person/day from 1st to 8th group of countries (Figure 6).

Wine consumption levels were statistically significantly higher in 4 groups: (p = 0.0017; 0.0054; 0.0061; 0.3; 0.9; 0.0169; 0.6) (Table 1). The gradient of increasing wine consumption increased exponentially from 1.000 g/person/day to 27.500 g/person/day from groups 1 to 6. In the 7th and 8th group of countries, the daily consumption of wine was 5.000 and 12.000g (Table 1).

Beer consumption levels were statistically significantly different in 6 groups of countries from 8 groups of countries: (p = 0.00001; 0.0000; 0.0005; 0.0256*; 0.3; 0.0167; 0.8) (Table 1). The gradient of median daily beer consumption had an increasing trend line in 8 groups of countries from 6 to 84 years (Table 1).

The levels of total consumption of alcoholic beverages in 5 groups of countries differed statistically significantly from the 8th group of countries: (p = 0.00000; 0.0000; 0.0000; 0.0102; 0.3; 0.0066; 0.9). The median total daily consumption of alcoholic beverages increased from 6g in the 1st group of countries to 230g in the 6th group of countries.

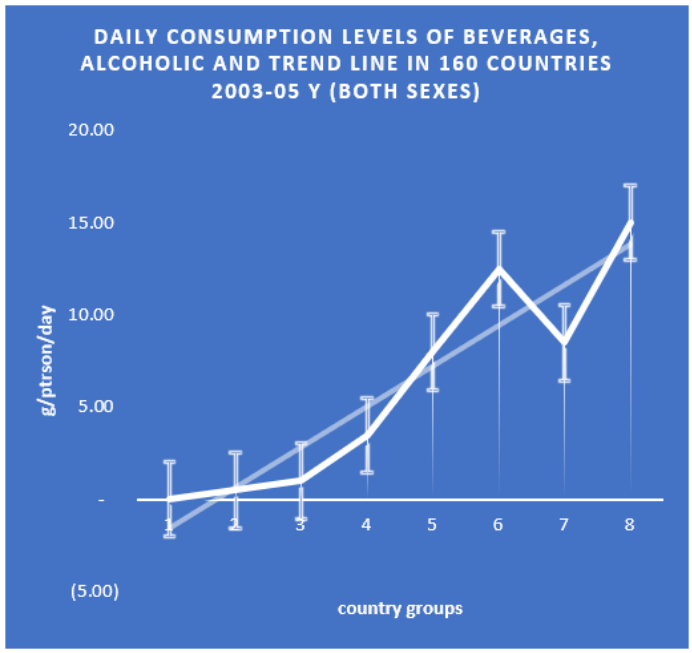

Figure 6: *Daily consumption levels of beverages, alcoholic and trend line in 160 countries 2003-05 y (both sexes).*

In groups 7 and 8 of countries, there was a decrease in beer consumption to 121g and 111g, respectively. The general trend line of beer consumption in 8 groups of countries was increasing (Table 1).

The share (%) of alcoholic beverages in the total level of food consumption had an increasing trend line from the 1st group of countries to the 8th group: from 0.5% to 7%. But in the 6th and 7th groups of countries it was 11% and 8% (Table 1).

1 and 8 country groups	**U**	**Z**	**p-value**	**Mean 1**	**Median 1**	**Quartile1**	**Std.Dev.1**	**Mean 8**	**Median 8**	**Quartile 8**	**Std.Dev. 8**
IPC 2000	112,00	- 2,37	0,01794	11877	1929	5808	21778	10098	7054	5258	8913
Gini Index 2021	144,00	- 1,28	0,20110	1	1	0	0	1	1	0	0
lat°	105,00	- 2,56	0,01058	20	15	16	11	37	45	40	21
UV rad J/m^2 2004	75,50	3,35	0,00080	4920	5332	1328	956	3142	2084	3178	1677
lon°	131,50	- 1,84	0,06586	40	33	34	47	56	54	58	34
Prosperity Rating	98,00	2,75	0,00604	90	98	45	34	59	61	40	32
Rating Educations	94,00	2,85	0,00432	90	89	61	39	54	47	47	34
Rating of the Social capital	147,00	1,42	0,15557	81	72	63	36	63	61	55	36

Rank of corruption 2016	148,50	1,38	0,16772	101	102	66	42	80	85	76	47
Rating of peacefulness	98,00	1,04	0,29619	96	101	56	35	79	88	66	43
HPI 2016	84,00	- 2,44	0,01469	5	4	2	1	6	6	1	1
Index of human development	91,00	- 2,93	0,00334	1	1	0	0	1	1	0	0
EEI Ecological efficiency index	101,00	- 2,31	0,02109	43	36	33	18	56	53	16	14
Access to the street. medicine1990	99,00	- 2,15	0,03167	70	72	44	26	89	93	18	12
Access to clean water1990	96,50	- 2,04	0,04097	50	35	80	39	78	84	34	23
Air pollution for children under 5 years old 2004	43,50	4,10	0,00004	209	145	204	224	23	3	24	45
Female life expectancy	121,50	- 2,11	0,03487	66	65	23	13	75	76	6	5
Male life expectancy	153,00	- 1,26	0,20845	62	61	22	12	68	68	7	6
Gender 2000	62,50	- 3,71	0,00021	4	4	2	1	8	7	5	3
Female life expectancy	63,50	- 3,06	0,00224	71	74	13	8	78	78	4	4
Male life expectancy	131,50	- 0,89	0,37272	67	69	14	8	70	70	6	5
Gender 2019	17,50	- 4,52	0,00001	3	3	2	1	8	7	4	2
M Death	155,00	1,20	0,22870	1345	1362	778	568	1137	1009	555	382
Hepatitis B (g)	90,00	2,96	0,00306	47	32	51	42	28	9	24	60
Hepatitis C (g)	52,00	3,99	0,00007	19	11	17	20	3	2	3	4
Infectious and parasitic diseases	121,00	2,12	0,03372	6683	4805	10313	6310	2200	1644	1998	2713
Noncommunicable diseases	187,00	- 0,34	0,73527	13275	14169	2698	2580	14007	13100	4092	3220
Liver cancer	116,00	2,26	0,02390	215	158	229	195	97	53	48	124
Alcohol use disorders	-	- 5,40	0,00000	57	60	54	32	1547	1 400	428	296
Cirrhosis of the liver	54,00	- 3,94	0,00008	196	158	93	130	547	487	418	310
Male BMI > 30 (kg/m^2)	144,00	- 1,50	0,13328	14	8	20	13	17	19	12	7
Total CL	90,00	- 2,96	0,00306	1078	869	979	576	1675	1738	985	558
Beverages, Alcoholic 2003-05	18,50	- 4,90	0,00000	1	0,000	1	2	19	15	17	15

Wine 2003-05	78,00	- 3,13	0,00173	7	0,000	1	30	12	12	17	11
Beer 2003-05	33,50	- 4,49	0,00001	13	6	10	20	108	84	111	78
AB amount	20,50	- 4,84	0,00000	21	6	13	48	138	111	135	90
Ba/wine	89,00	- 2,99	0,00280	0	0	0	1	2	1	2	3
Ba/Ab	65,00	- 3,64	0,00027	0	0	0	0	0	0	0	0
Red m/Gl	111,00	- 2,39	0,01667	0	0	0	0	0	0	0	0
Fat a/ Oil v	110,50	- 2,41	0,01606	0	0	1	1	1	0	1	1
AP Energy% 2003-05	73,00	- 3,42	0,00062	12	10	10	7	22	23	13	8
Energy (kcal/person/day)2003-05	145,50	- 1,46	0,14410	2597	2680	905	564	2815	2865	595	408
2 and 8 country groups	**U**	**Z**	**p-value**	**Mean 2**	**Median 2**	**Quartile 2**	**Std.Dev. 2**	**Mean 8**	**Median 8**	**Quartile 8**	**Std.Dev. 8**
IPC 2000	94,00	- 2,85	0,0043	7013	2074	4889	14544	10098	7054	5258	8913
Gini Index 2021	146,50	- 0,98	0,3281	0,736	0,722	0	0	1	1	0	0
lat°	106,50	- 2,52	0,0119	21	19	25	13	37	45	40	21
UV rad J/m2 2004	113,00	2,34	0,0193	4462	4709	1326	891	3142	2084	3178	1677
lon°	135,00	- 1,74	0,0810	36	32	28	29	56	54	58	34
Prosperity Rating	65,00	3,64	0,0003	102	105	57	31	59	61	40	32
Rating Educations	70,00	3,50	0,0005	98	101	55	32	54	47	47	34
Rating of the Social capital	87,50	3,03	0,0024	99	116	59	36	63	61	55	36
Rank of corruption 2016	88,50	2,84	0,0045	123	133	42	37	80	85	76	47
Rating of peacefulness	114,00	1,27	0,2038	97	105	79	43	79	88	66	43
HPI 2016	31,00	- 3,70	0,0002	5	4	1	1	6	6	1	1
Index of human development	57,00	- 3,85	0,0001	0,596	0,543	0	0	1	1	0	0
EEI Ecological efficiency index	92,00	- 2,74	0,0062	41	40	23	16	56	53	16	14
Access to the street. Medicine 1990	68,50	- 2,77	0,0056	68	75	42	23	89	93	18	12
Access to clean water 1990	41,00	- 3,08	0,0021	39	27	56	32	78	84	34	23
Air pollution for children under 5 years old 2004	54,50	3,79	0,0001	181	128	278	174	23	3	24	45

Female life expectancy	73,00	- 3,42	0,0006	61	61	23	14	75	76	6	5
Male life expectancy	116,50	- 2,25	0,0248	58	58	23	12	68	68	7	6
Gender 2000	48,00	- 4,10	0,0000	3	3	4	2	8	7	5	3
Female life expectancy	77,00	- 3,00	0,0027	68	67	17	10	78	78	4	4
Male life expectancy	123,00	- 1,65	0,0986	64	64	17	10	70	70	6	5
Gender 2019	44,50	- 3,95	0,0001	4	3	3	2	8	7	4	2
M Death	116,00	2,26	0,0239	1585	1606	1236	664	1137	1009	555	382
Hepatitis B (g)	108,00	2,48	0,0133	45	32	41	55	28	9	24	60
Hepatitis C (g)	35,00	4,45	0,0000	22	16	17	26	3	2	3	4
Infectious and parasitic diseases	96,00	2,80	0,0051	11105	8939	19019	10400	2200	1644	1998	2713
Noncommunicable diseases	191,00	- 0,23	0,8181	13309	13203	2365	2142	14007	13100	4092	3220
Liver cancer	163,00	0,99	0,3235	225	107	326	256	97	53	48	124
Alcohol use disorders	-	- 5,40	0,0000	139	139	63	31	1547	1 400	428	296
Cirrhosis of the liver	50,00	- 4,04	0,0001	212	182	108	129	547	487	418	310
Male BMI > 30 (kg/m^2)	72,00	- 3,45	0,0006	7	3	9	8	17	19	12	7
Total CL	89,00	- 2,99	0,0028	1064	873	1036	627	1675	1738	985	558
Beverages, Alcoholic 2003-05	37,50	- 4,38	0,0000	4	0,500	2	11	19	15	17	15
Wine 2003-05	90,50	- 2,78	0,0054	6	0	3	22	12	12	17	11
Beer 2003-05	47,00	- 4,13	0,0000	23	8	14	48	108	84	111	78
AB amount	38,00	- 4,37	0,0000	33	12	27	70	138	111	135	90
Ba/wine	97,50	- 2,76	0,0058	0	0	0	1	2	1	2	3
Ba/Ab	118,00	- 2,20	0,0275	0	0	0	0	0	0	0	0
Fat a/ Oil v	98,50	- 2,73	0,0063	0	0	0	0	1	0	1	1
AP Energy% 2003-05	62,00	- 3,72	0,0002	10	7	11	8	22	23	13	8
Energy (kcal/person/day) 2003-05	137,00	- 1,69	0,0909	2510	2335	1030	549	2815	2865	595	408
3 and 8 country groups	**U**	**Z**	**p-value**	**Mean 3**	**Median 3**	**Quartile 3**	**Std.Dev. 3**	**Mean 8**	**Median 8**	**Quartile 8**	**Std.Dev. 8**
IPC 2000	82,00	- 3,18	0,0015	4910	1889	2835	7565	10098	7054	5258	8913
Gini Index 2021	138,50	- 1,21	0,2257	0,722	0,730	0	0	1	1	0	0

lat°	81,00	- 3,21	0,0013	15	13	13	11	37	45	40	21
UV rad J/m^2 2004	83,00	3,15	0,0016	4870	5218	868	922	3142	2084	3178	1677
lon°	161,00	- 1,04	0,2977	48	33	47	47	56	54	58	34
Prosperity Rating	79,00	3,26	0,0011	96	105	49	32	59	61	40	32
Rating Educations	72,00	3,45	0,0006	98	105	54	35	54	47	47	34
Rating of the Social capital	119,00	2,18	0,0294	87	85	38	26	63	61	55	36
Rank of corruption 2016	149,00	0,89	0,3726	94	90	81	48	80	85	76	47
Rating of peacefulness	123,00	0,71	0,4794	90	92	79	45	79	88	66	43
HPI 2016	45,00	- 3,68	0,0002	5	4	1	1	6	6	1	1
Index of human development	53,00	- 3,96	0,0001	0,600	0,553	0	0	1	1	0	0
EEI Ecological efficiency index	65,00	- 3,50	0,0005	41	39	13	12	56	53	16	14
Access to the street. medicine1990	53,50	- 3,54	0,0004	61	56	36	23	89	93	18	12
Access to clean water1990	47,50	- 3,47	0,0005	35	27	32	31	78	84	34	23
Air pollution for children under 5 years old 2004	77,00	3,16	0,0016	230	73	414	329	23	3	24	45
Female life expectancy	69,50	- 3,52	0,0004	58	53	22	15	75	76	6	5
Male life expectancy	81,50	- 3,19	0,0014	55	52	18	13	68	68	7	6
Gender 2008	44,50	- 4,19	0,0000	3	2	4	3	8	7	5	3
Female life expectancy	58,50	- 3,81	0,0001	67	64	11	9	78	78	4	4
Male life expectancy	82,00	- 3,18	0,0015	62	61	11	8	70	70	6	5
Gender 2019	51,50	- 4,00	0,0001	4	4	2	2	8	7	4	2
M Death	94,00	2,85	0,0043	1733	1948	1052	694	1137	1009	555	382
Hepatitis B (g)	97,00	2,77	0,0056	49	35	61	43	28	9	24	60
Hepatitis C (g)	45,00	4,18	0,0000	21	18	19	18	3	2	3	4
Infectious and parasitic diseases	61,00	3,75	0,0002	13966	16528	15670	10014	2200	1644	1998	2713
Noncommunicable diseases	199,00	- 0,01	0,9892	13624	14084	3630	2960	14007	13100	4092	3220
Liver cancer	101,00	2,66	0,0077	206	176	170	166	97	53	48	124

Alcohol use disorders	-	- 5,40	0,0000	230	232	30	20	1547	1 400	428	296
Cirrhosis of the liver	41,00	- 4,29	0,0000	173	164	69	81	547	487	418	310
Male BMI > 30 (kg/m^2)	62,00	- 3,72	0,0002	7	4	4	8	17	19	12	7
Total CL	64,50	- 3,65	0,0003	892	630	517	579	1675	1738	985	558
Beverages, Alcoholic 2003-05	41,00	- 4,29	0,0000	3	1,000	2	6	19	15	17	15
Wine 2003-05	86,00	- 2,74	0,0061	3	1	3	5	12	12	17	11
Beer 2003-05	71,00	- 3,48	0,0005	33	19	42	34	108	84	111	78
AB amount	48,00	- 4,10	0,0000	38	20	42	39	138	111	135	90
Ba/wine	124,00	- 2,04	0,0411	1	0	0	1	2	1	2	3
Ba/Ab	126,50	- 1,97	0,0483	0	0	0	0	0	0	0	0
Red m/Gl	102,00	- 2,64	0,0084	0	0	0	0	0	0	0	0
Fat a/ Oil v	98,50	- 2,73	0,0063	1	0	0	2	1	0	1	1
AP Energy% 2003-05	47,00	- 4,13	0,0000	10	8	8	6	22	23	13	8
Energy (kcal/person/day) 2003-05	93,00	- 2,88	0,0040	2395	2335	645	477	2815	2865	595	408
4 and 8 country groups	**U**	**Z**	**p-value**	**Mean 4**	**Median4**	**Quartile 4**	**Std.Dev. 4**	**Mean 8**	**Median 8**	**Quartile 8**	**Std.Dev. 8**
IPC 2000	129,00	- 1,91	0,0565	7447	4127	10148	8566	10098	7054	5258	8913
Gini Index 2021	107,50	- 2,12	0,0343	0,697	0,681	0,073	0,060	0,746	0,770	0,131	0,093
lat°	124,00	- 2,04	0,0411	25	31	31	17	37	45	40	21
UV rad J/m^2 2004	137,00	1,69	0,0909	3929	3719	1979	1155	3142	2084	3178	1677
lon°	166,00	- 0,91	0,3648	48	32	43	39	56	54	58	34
Prosperity Rating	144,00	1,50	0,1333	75	72	38	36	59	61	40	32
Rating Educations	133,00	1,80	0,0720	72	72	49	33	54	47	47	34
Rating of the Social capital	199,00	0,01	0,9892	64	72	72	42	63	61	55	36
Rank of corruption 2016	157,00	1,15	0,2503	98	101	96	53	80	85	76	47
Rating of peacefulness	137,50	0,21	0,8360	82	89	42	36	79	88	66	43
HPI 2016	92,00	- 2,74	0,0062	5	5	1	1	6	6	1	1
Index of human development	113,50	- 2,33	0,0200	1	1	0	0	1	1	0	0

EEI Ecological efficiency index	133,00	- 1,59	0,1124	48	46	22	15	56	53	16	14
Access to the street. medicine1990	100,00	- 1,28	0,2010	77	80	35	23	89	93	18	12
Access to clean water1990	107,50	- 1,26	0,2087	64	79	53	31	78	84	34	23
Air pollution for children under 5 years old 2004	109,50	2,25	0,0246	124	51	184	203	23	3	24	45
Female life expectancy	136,50	- 1,70	0,0884	66	72	26	16	75	76	6	5
Male life expectancy	157,00	- 1,15	0,2503	61	65	23	14	68	68	7	6
Gender 2008	95,50	- 2,81	0,0049	5	5	4	3	8	7	5	3
Female life expectancy	112,50	- 2,16	0,0305	72	73	15	9	78	78	4	4
Male life expectancy	155,50	- 0,96	0,3394	68	68	13	9	70	70	6	5
Gender 2019	52,00	- 3,86	0,0001	5	4	2	2	8	7	4	2
M Death	120,00	2,15	0,0315	1650	1392	1223	839	1137	1009	555	382
Hepatitis B (g)	155,00	1,20	0,2287	40	13	69	49	28	9	24	60
Hepatitis C (g)	107,00	2,50	0,0123	19	6	24	28	3	2	3	4
Infectious and parasitic diseases	134,00	1,77	0,0764	10459	2972	19494	14935	2200	1644	1998	2713
Noncommunicable diseases	199,00	- 0,01	0,9892	13651	13782	4227	3329	14007	13100	4092	3220
Liver cancer	179,00	0,55	0,5792	131	52	147	141	97	53	48	124
Alcohol use disorders	-	- 5,40	0,0000	345	349	75	49	1547	1 400	428	296
Cirrhosis of the liver	103,00	- 2,61	0,0090	326	198	324	331	547	487	418	310
Male BMI > 30 (kg/m^2)	130,00	- 1,88	0,0601	12	10	14	9	17	19	12	7
Beverages, Alcoholic 2003-05	60,00	- 3,77	0,0002	5	4	8	5	19	15	17	15
Wine 2003-05	157,00	- 0,91	0,3612	14	4	14	22	12	12	17	11
Beer 2003-05	117,00	- 2,23	0,0256	64	31	82	79	108	84	111	78
AB amount	104,50	- 2,57	0,0102	83	38	112	98	138	111	135	90
Ba/wine	145,00	- 1,47	0,1404	1	0	1	2	2	1	2	3
Ba/Ab	119,50	- 2,16	0,0305	0	0	0	0	0	0	0	0
Red m/Gl	147,00	- 1,42	0,1556	0	0	0	0	0	0	0	0
Fat a/ Oil v	177,50	0,60	0,5518	1	1	1	1	1	0	1	1

AP Energy% 2003-05	140,00	- 1,61	0,1075	16	17	18	10	22	23	13	8
Energy (kcal/person/day) 2003-05	152,50	- 1,27	0,2036	2612	2600	810	560	2815	2865	595	408
	Medium drinkers strong alcohol										
5 and 8 country groups	**U**	**Z**	**p-value**	**Mean 5**	**Median 5**	**Quartile 5**	**Std.Dev. 5**	**Mean 8**	**Median 8**	**Quartile 8**	**Std.Dev. 8**
IPC 2000	196,00	0,09	0,9246	11746	8325	14939	10397	10098	7054	5258	8913
Gini Index 2021	124,00	- 1,41	0,1577	1	1	0	0	1	1	0	0
lat°	152,50	- 1,27	0,2036	29	28	23	17	37	45	40	21
UV rad J/m2 2004	153,00	1,26	0,2085	3585	4121	2411	1360	3142	2084	3178	1677
lon°	187,00	0,34	0,7353	62	69	73	39	56	54	58	34
Prosperity Rating	179,00	- 0,30	0,7680	55	55	45	30	59	61	40	32
Rating Educations	166,00	0,66	0,5091	59	59	51	30	54	47	47	34
Rating of the Social capital	189,00	- 0,01	0,9888	62	67	47	34	63	61	55	36
Rank of corruption 2016	183,00	- 0,18	0,8551	78	69	80	47	80	85	76	47
Rating of peacefulness	145,00	- 0,52	0,6016	68	66	104	51	79	88	66	43
HPI 2016	120,00	- 1,30	0,1939	6	5	2	1	6	6	1	1
Index of human development	188,00	- 0,04	0,9664	1	1	0	0	1	1	0	0
EEI Ecological efficiency index	159,00	0,61	0,5398	58	55	33	17	56	53	16	14
Access to the street. medicine1990	145,50	- 0,49	0,6233	83	88	30	20	89	93	18	12
Access to clean water1990	140,00	- 0,41	0,6799	70	83	42	34	78	84	34	23
Air pollution for children under 5 years old 2004	183,50	0,43	0,6652	33	4	46	48	23	3	24	45
Female life expectancy	192,00	0,20	0,8392	74	76	9	10	75	76	6	5
Male life expectancy	150,00	1,34	0,1806	69	71	9	8	68	68	7	6
Gender 2008	103,00	- 2,61	0,0090	5	6	2	3	8	7	5	3
Female life expectancy	192,00	- 0,20	0,8392	77	78	11	6	78	78	4	4
Male life expectancy	164,50	0,95	0,3438	72	71	10	6	70	70	6	5

Gender 2019	87,00	- 3,04	0,0023	5	5	2	2	8	7	4	2
M Death	194,00	0,15	0,8817	2482	1128	680	4351	1137	1009	555	382
Hepatitis B (g)	161,00	1,04	0,2977	39	11	75	53	28	9	24	60
Hepatitis C (g)	106,00	2,53	0,0114	15	8	26	17	3	2	3	4
Infectious and parasitic diseases	195,00	- 0,12	0,9031	3114	1605	2756	5140	2200	1644	1998	2713
Noncommunicable diseases	158,00	- 1,12	0,2616	12601	13353	4570	2964	14007	13100	4092	3220
Liver cancer	192,00	0,20	0,8392	80	61	52	70	97	53	48	124
Alcohol use disorders	-	- 5,40	0,0000	570	570	150	76	1547	1 400	428	296
Cirrhosis of the liver	104,00	- 2,58	0,0098	324	294	189	244	547	487	418	310
Male BMI > 30 (kg/m^2)	184,00	- 0,42	0,6750	15	20	18	10	17	19	12	7
Total CL	168,00	- 0,85	0,3942	1546	1545	902	543	1675	1738	985	558
Beverages, Alcoholic 2003-05	117,00	- 2,23	0,0256	9	8,0	13	8	19	15,0	17	15
Wine 2003-05	186,50	0,08	0,9328	26	4	32	41	12	12	17	11
Beer 2003-05	164,00	- 0,96	0,3369	93	63	141	85	108	84	111	78
AB amount	165,50	- 0,92	0,3577	129	78	184	120	138	111	135	90
Ba/wine	150,00	- 1,34	0,1806	1	0	1	3	2	1	2	3
Ba/Ab	169,50	- 0,81	0,4171	0	0	0	0	0	0	0	0
Red m/Gl	160,00	- 1,07	0,2853	0	0	0	0	0	0	0	0
Fat a/ Oil v	179,50	- 0,54	0,5885	1	0	0	1	1	0	1	1
AP Energy% 2003-05	154,50	- 1,22	0,2235	19	18	16	10	22	23	13	8
Energy (kcal/person/day) 2003-05	178,50	0,57	0,5700	2920	2880	795	493	2815	2865	595	408
6 and 8 country groups	**U**	**Z**	**p-value**	**Mean 6**	**Median 6**	**Quartile 6**	**Std.Dev. 6**	**Mean 8**	**Median 8**	**Quartile 8**	**Std.Dev. 8**
IPC 2000	138,00	1,66	0,0962	17903	11096	23115	14277	10098	7054	5258	8913
Gini Index 2021	159,00	- 0,86	0,3915	1	1	0	0	1	1	0	0
lat°	192,00	- 0,20	0,8392	39	47	19	17	37	45	40	21
UV rad J/m2 2004	179,50	- 0,54	0,5885	2690	2024	1659	1394	3142	2084	3178	1677
lon°	97,00	- 2,77	0,0056	30	30	44	29	56	54	58	34

Prosperity Rating	139,00	- 1,64	0,1017	40	38	60	29	59	61	40	32
Rating Educations	156,00	- 1,18	0,2393	40	42	60	30	54	47	47	34
Rating of the Social capital	167,50	- 0,87	0,3867	51	51	59	37	63	61	55	36
Rank of corruption 2016	128,00	- 1,93	0,0531	52	44	66	43	80	85	76	47
Rating of peacefulness	70,00	- 2,72	0,0065	41	37	45	29	79	88	66	43
HPI 2016	135,50	1,06	0,2875	6	7	1	1	6	6	1	1
Index of human development	127,00	1,96	0,0499	1	1	0	0	1	1	0	0
EEI Ecological efficiency index	146,00	1,22	0,2216	62	65	28	15	56	53	16	14
Access to the street. medicine1990	116,00	1,20	0,2283	91	99	16	15	89	93	18	12
Access to clean water1990	88,00	1,71	0,0871	89	100	21	19	78	84	34	23
Air pollution for children under 5 years old 2004	114,50	- 2,30	0,0215	7	0	1	17	23	3	24	45
Female life expectancy	117,00	2,23	0,0256	79	80	5	4	75	76	6	5
Male life expectancy	85,50	3,08	0,0020	73	74	5	4	68	68	7	6
Gender 2008	120,00	- 2,15	0,0315	6	6	2	1	8	7	5	3
Female life expectancy	123,50	1,64	0,1016	80	81	5	4	78	78	4	4
Male life expectancy	91,00	2,59	0,0097	74	75	7	5	70	70	6	5
Gender 2019	90,50	- 2,60	0,0093	6	6	2	1	8	7	4	2
M Death	95,00	- 2,83	0,0047	826	744	319	264	1137	1009	555	382
Hepatitis B (g)	161,00	- 1,04	0,2977	9	5	4	17	28	9	24	60
Hepatitis C (g)	164,00	0,96	0,3369	7	3	8	10	3	2	3	4
Infectious and parasitic diseases	119,00	- 2,18	0,0294	882	250	1554	1112	2200	1644	1998	2713
Noncommunicable diseases	112,00	- 2,37	0,0179	11676	11220	3491	2441	14007	13100	4092	3220
Liver cancer	198,00	0,04	0,9676	133	55	53	314	97	53	48	124
Alcohol use disorders	-	- 5,40	0,0000	797	800	98	54	1547	1 400	428	296
Cirrhosis of the liver	86,00	- 3,07	0,0021	289	254	205	174	547	487	418	310

Male BMI > 30 (kg/m^2)	125,50	2,00	0,0453	22	23	9	6	17	19	12	7
Total CL	132,00	1,83	0,0679	1991	2095	835	535	1675	1738	985	558
Beverages, Alcoholic 2003-05	181,00	- 0,50	0,6168	16	13	10	11	19	15	17	15
Wine 2003-05	104,50	2,39	0,0169	44	28	57	49	12	12	17	11
Beer 2003-05	111,00	2,39	0,0167	192	182	136	115	108	84	111	78
AB amount	99,00	2,72	0,0066	251	230	190	141	138	111	135	90
Ba/wine	193,50	- 0,16	0,8711	1,9	0,5	2	4	1,8	1,0	2	3
Ba/Ab	116,50	- 2,25	0,0248	0,09	0,05	0	0	0,18	0,12	0	0
Fat a/ Oil v	170,50	0,78	0,4328	1	0	1	1	1	0	1	1
AP Energy% 2003-05	137,00	1,69	0,0909	26	26	13	8	22	23	13	8
Energy (kcal/person/day) 2003-05	120,00	2,15	0,0315	3149	3270	765	478	2815	2865	595	408
7 and 8 country groups	**U**	**Z**	**p-value**	**Mean 7**	**Median 7**	**Quartile 7**	**Std.Dev.7**	**Mean 8** 	**Median 8** 	**Quartile 8**	**Std.Dev. 8**
IPC 2000	192,00	0,20	0,8392	11933	8421	15780	11001	10098	7054	5258	8913
Gini Index 2021	168,50	- 0,06	0,9515	1	1	0	0	1	1	0	0
lat°	147,00	- 1,42	0,1556	28	27	21	15	37	45	40	21
UV rad J/m2 2004	159,00	1,10	0,2733	3813	4267	2082	1277	3142	2084	3178	1677
lon°	159,00	1,10	0,2733	72	70	37	36	56	54	58	34
Prosperity Rating	187,00	- 0,34	0,7353	53	53	59	34	59	61	40	32
Rating Educations	187,00	0,34	0,7353	58	64	49	32	54	47	47	34
Rating of the Social capital	187,50	- 0,32	0,7455	59	61	72	38	63	61	55	36
Rank of corruption 2016	169,00	- 0,58	0,5646	70	69	98	53	80	85	76	47
Rating of peacefulness	120,50	- 1,30	0,1946	60	64	56	41	79	88	66	43
HPI 2016	155,00	0,97	0,3324	6	6	2	1	6	6	1	1
Index of human development	196,50	- 0,08	0,9353	1	1	0	0	1	1	0	0
EEI Ecological efficiency index	177,00	0,35	0,7254	58	53	19	12	56	53	16	14

Access to the street. medicine1990	147,00	- 0,69	0,4929	85	90	23	15	89	93	18	12
Access to clean water1990	159,00	- 0,32	0,7490	73	84	46	27	78	84	34	23
Air pollution for children under 5 years old 2004	182,00	0,47	0,6359	31	11	34	60	23	3	24	45
Female life expectancy	162,00	1,01	0,3104	77	78	7	6	75	76	6	5
Male life expectancy	123,00	2,07	0,0385	71	72	7	6	68	68	7	6
Gender 2008	111,00	- 2,39	0,0167	5	6	2	1	8	7	5	3
Female life expectancy	158,00	0,63	0,5296	78	78	6	5	78	78	4	4
Male life expectancy	119,50	1,75	0,0794	73	72	7	5	70	70	6	5
Gender 2019	86,50	- 2,72	0,0066	5	5	3	2	8	7	4	2
M Death	125,00	- 2,02	0,0439	894	866	512	293	1137	1009	555	382
Hepatitis B (g)	199,00	- 0,01	0,9892	21	5	16	36	28	9	24	60
Hepatitis C (g)	109,50	2,43	0,0149	11	4	14	15	3	2	3	4
Infectious and parasitic diseases	185,00	- 0,39	0,6949	1654	1119	2138	1616	2200	1644	1998	2713
Noncommunicable diseases	136,00	- 1,72	0,0859	12112	12609	3123	2223	14007	13100	4092	3220
Liver cancer	181,00	- 0,50	0,6168	87	45	30	102	97	53	48	124
Alcohol use disorders	-	- 5,40	0,0000	982	968	159	85	1547	1 400	428	296
Cirrhosis of the liver	116,00	- 2,26	0,0239	348	284	304	250	547	487	418	310
Male BMI > 30 (kg/m^2)	167,50	0,87	0,3867	18	20	13	9	17	19	12	7
Total CL	180,00	- 0,53	0,5979	1590	1546	847	470	1675	1738	985	558
Beverages, Alcoholic 2003-05	113,50	- 2,33	0,0200	9	9	8	5	19	15	17	15
Wine 2003-05	171,50	0,51	0,6130	22	5	38	28	12	12	17	11
Beer 2003-05	191,00	- 0,23	0,8181	107	83	130	81	108	84	111	78
AB amount	195,50	- 0,11	0,9138	138	121	156	95	138	111	135	90
Ba/wine	193,50	0,16	0,8711	2	0	3	3	2	1	2	3
Ba/Ab	148,50	- 1,38	0,1677	0	0	0	0	0	0	0	0
AP Protein% 1990-92	186,50	0,08	0,9328	46	46	28	16	45	46	22	15

Energy (kcal/ person/day) 2003-05	189,00	- 0,28	0,7764	2836	2870	615	452	2815	2865	595	408

Table 1: *Comparative analysis of the burden of alcoholism in 160 mtans of the world in 2004 (Mann-Whitney U test).*

Legend: IPC: Gdp; UV: Ultraviolet; HPI: Happiness Index; BMI: Body Mass Index; ch: Blood Cholesterol; AP: Animal Products; GV: Cereals, Vegetables; FD: Fruit, sweeteners; AB: Alcoholic Drinks .

1	2	3	4	5	6	7	8
Samoa	Malawi	Kenya	Mauritius	Iceland	Czech Republic	Canada	Finland
Libyan	Sudan	Liberia	Indonesia	Cambodia	Paraguay	United States of America	Ecuador
Kuwait	Syrian AR	Zambia	Uzbekistan	South Africa	Guyana	Dominican Republic	Guatemala
Mauritania	Bangladesh	Angola	Sierra Leone	India	Bosnia and Herzegovina	Costa Rica	Bahamas
Comoros	Madagascar	Cape Verde	Armenia	Malaysia	Ireland	Argentina	Thailand
Niger	Mozambique	Israel	Swaziland	Azerbaijan	Suriname	Chile	Ukraine
Guinea	Iran (Islamic Republic of)	Ghana	Turkmenistan	Nepal	Poland	Australia	Kazakhstan
Algeria	Côte d'Ivoire	Japan	Rwanda	Fiji	Luxembourg	China	Haiti
Yemen	Pakistan	Cameroon	Gabon	Viet Nam	Panama	Nicaragua	Slovakia
Mali	Morocco	Chad	Tajikistan	Mexico	Mongolia	Belize	Colombia
Saudi Arabia	Congo DR	Turkey	Zimbabwe	Greece	Serbia and M	Venezuela	Peru
Jordan	The Gambia	Namibia	New Zealand	Bulgaria	Denmark	Bolivia	El Salvador
Egypt	Central African	Solomon Islands	Burundi	Trinidad and Tobago	Barbados	Honduras	Norway
Eritrea	Guinea-Bissau	Myanmar	Belgium	Switzerland	France	Uruguay	Belarus
Senegal	Tunisia	Tanzania	Albania	Slovenia	Croatia	United Kingdom	Latvia
Italy	Brunei	Botswana	Jamaica	Korea DR	Germany	Georgia	Estonia
Togo	Congo R	Ethiopia	Kyrgyzstan	Cuba	The Netherlands	Philippines	Korea R
United Arab E	Lebanon	Vanuatu	Malta	Sri Lanka	Romania	Brazil	Lithuania
Djibouti	Spain	Burkina Faso	Cyprus	Portugal	Canada	Sweden	R Moldova
Benin	Lesotho	Nigeria	Uganda	Austria	United States of America	Lao PDR	Russian F

Table 2: *Country groups 1 and 8 - Lists.*

It has been established that the ratio of the level of strong alcohol consumption to wine, beer, as well as to the total consumption of alcoholic beverages in countries has a statistically significant increasing trend line, similar to alcoholism (Table 1 and figure 7).

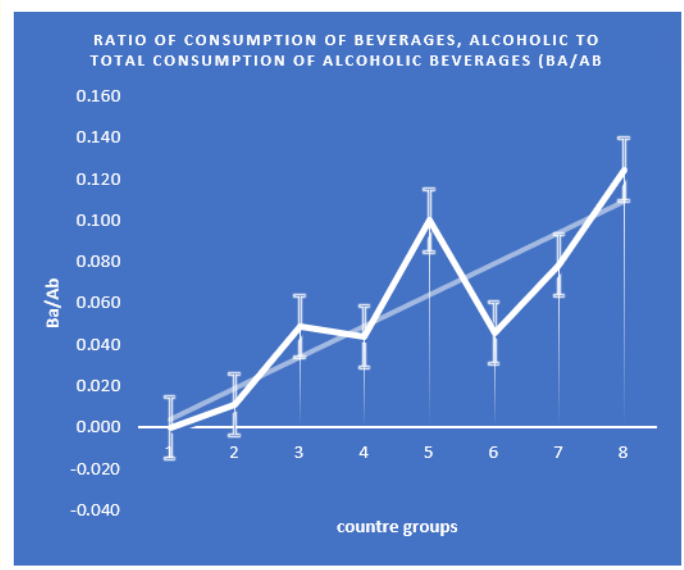

Figure 7: *Ratio of consumption of beverages, alcoholic to total consumption of alcoholic beverages (Ba/Ab).*

It is noted that the highest ratios of strong alcohol to the levels of consumption of alcoholic beverages in countries, the higher, the higher the burden of alcoholism.

Discussion of the Results

In accordance with the set goal, our studies showed that the minimum incidence of alcoholism in the three countries of group 1 was 230 times lower than the maximum incidence in three countries of group 8. The total average incidence in the 1st group of countries was statistically significantly 23 times lower than in the 8th group of countries.

The alcoholism gradient burden study model has proven to be productive. Against the background of the alcoholism gradient, the dynamics of risk factors is more noticeable.

In Russia in the 1970s, alcohol abusers were isolated and forced to do forced labor. But by the age of 80, researchers came to the conclusion that "troublemakers" suffer from a number of neuropsychiatric disorders and need help [28,29]. Alcohol is a readily available antidepressant for them. Twin methods and analysis of close relatives of alcoholics revealed a genetic predisposition to alcohol abuse [30,31].

Much discussion in modern research is conducted regarding the minimum safe doses of alcohol. Oncologists are categorically against even minimal doses of alcohol [32]. But diabetologists and cardiologists note the favorable effect of small doses of alcohol [33]. Dose problems are due to ethnic, genetic, gender and even geographical differences in human sensitivity to alcohol [34].

Researchers at the University of Cambridge showed that the minimum risk of death from all causes is about 100g of alcohol per week. Against, increased alcohol consumption is associated with a lower risk of myocardial infarction. Alcohol consumption > 100 - ≤ 200g per week, > 200 - ≤ 350g per week, or > 350g per week reduced life expectancy by 6 months, 1 - 2 years, or 4 - 5 years, respectively [35].

In the USA, for example, an upper limit of 196 g per week (about 11 standard UK glasses of wine or pints of beer per week) is recommended for men, and an upper limit of 98g per week is recommended for women. Similar recommendations apply in Canada and Sweden [36].

Such variation in policy might reflect ambiguity about drinking risk thresholds associated with the lowest risk of mortality, as well as uncertainty about the specific consequences of alcohol consumption, including those related to cardiovascular disease subtypes. For example, recent studies have challenged the concept that moderate alcohol consumption is universally associated with lower cardiovascular disease risk [35,37-40].

Our research showed that LE of men in the 1st group of countries (teetotalers) is not statistically significantly different from the 8th group of countries (alcoholics). Recall: Group 1 countries - the minimum burden of alcoholism. 8 group of countries - the maximum burden of alcoholism. However, the LE of women in group 1 countries is statistically significantly lower than the LE of women in group 8 by 11 years.

As a result, the mean and median gender difference between women's LE and men's LE in 2000 is statistically significantly higher by 4 - 3 years in group 8 compared to group 1.

In 2019, the LE of women in group 1 increased by 9 years. LE of men in group 1 increased by 8 years. The gender difference in group 1 decreased by 1 year compared to 2000. In the 8th group of countries, by 2019, the LE of women and men increased by 2 years. Therefore, the gender difference between LE women and LE men in group 8 remained the same.

But the statistically significant gap in the gender gap increased between group 1 and group 8 countries by 1 year by 2019.

The reasons for the gender difference in LE of women and LE of men are multifactorial [41-44]. In 1987, it was concluded that no hypothesis about the causes of the difference in LE between men and women can explain this phenomenon [41-44].

So, we found that the LE of men in group 1 (teetotalers) should not be considered “the same” as the LE of men in group 8 in 2000 and 2019, in the absence of statistical differences. In the 1st group of countries, the gender difference LE is natural biological.

In group 8 countries (alcoholics), the high gender gap is the result of the loss of male LE as a result of a combination of risk factors.

The median burden of alcoholism in group 6 countries was 800 DALYs. In group 8 countries, the median burden of alcoholism was 1400 DALYs and was statistically significantly different from group 6 ($p = 0.0000$). But the total consumption of alcoholic beverages in the 6th group of countries was 2 times higher (230 vs. 111 g/day) than in the 8th group ($p = 0.007$). In the same time, the share of strong alcohol in the total consumption of alcoholic beverages was 2 times higher in the 8th group of countries ($p = 0.024$).

Previously, we showed a similar difference in the burden of alcoholism in another study [45]. It is likely that alcohol consumption levels, alcoholism, and the LE gender difference are related by complex factors [46].

In our research, the 5th group of countries turned out to be average drinkers in terms of consumption of strong alcohol (6.13 g/day), wine (6.8 g/day), beer (57.3 g/day) and total consumption of alcoholic beverages (73.8 g/day) (Table 1).

The burden of alcoholism in this group was 570 DALYs and was statistically significantly different from the 8th group of countries by 3 times (p = 0.0000).

LE of women and men was not statistically significantly different in the 5th group of countries from the 8th group of countries. But for men, LE in group 5 was higher by 1 year in 2000 and 2019.

The gender difference LE was statistically significantly higher in the 8th group of countries in 2000 by 1 year, in 2019 by 3 years (p = 0.005) (Table 1).

Thus, the "folk sign" is similar to the truth. But the gender difference with high statistical significance is steadily increasing from group 1 to group 8. It can be concluded that the consumption of alcoholic beverages and alcoholism reduces the LE of men.

We noticed that out of 20 countries of the 8th group, 40% of countries belong to Eastern Europe. To test our hypothesis, we conducted a comparative statistical analysis of male and female LE between 15 countries with the highest income and 15 countries countries with the maximum alcoholism of the 8th group of countries.

The result was that the median gender difference LE in high-income countries in 2000 was 5 years. In 2019 - 4 years.

In 15 countries with the maximum alcoholism of the 8th group of countries , the gender difference LE in 2000 was 8 years (p = 0.0000). In 2019, the gender difference increased to 9 years (p = 0.0000). In the countries with the maximum alcoholism of the 8th group of countries, the LE gender difference is not only the highest in the world, have passed since the collapse.

The median burden of alcoholism in high-income countries is 746 DALYs. In the countries with the maximum alcoholism of the 8th group of countries, 1276 DALYs (p = 0.0745).

In our studies, comorbid cirrhosis of the liver increased statistically significantly from the 1st group of countries to the 8th group. The nature of alcoholic cirrhosis of the liver is well known [47-49]. But the trend line of liver cancer and hepatitis B and C decreased from group 1 to group 8, which contradicts modern ideas about the pathogenesis of liver cancer [50-52].

Conclusion

The study found that the burden of alcoholism was 23 times higher in group 8 countries compared to group 1 in 160 countries in 2004. The main risk factor for alcoholism in men is not the total consumption of alcoholic beverages.

A statistically significant risk factor for alcoholism is the level of strong alcohol consumption. The gender difference in LE between women and men is statistically significantly higher in countries with a high burden of alcoholism. The popular belief about the same life expectancy of teetotalers and alcoholics cannot be considered true without taking into account the gender difference LE.

Risk factors for alcoholism and the gender difference in LE require further study.

Conflict of Interest

The authors have no conflict of interest.

Acknowledgments

The authors express their gratitude for consultations and useful advice to Doctor of Biological Sciences Anatoly Sergeevich Kabankin.

Bibliography

1. Minzer S., *et al*. "The Effect of Alcohol on Cardiovascular Risk Factors: Is There New Information?" *Nutrients* 12.4 (2020): 912.
2. Rocco A., *et al*. "Alcoholic disease: liver and beyond". *World Journal of Gastroenterology* 20.40 (2014): 14652-14659.
3. Boden JM and Fergusson DM. "Alcohol and depression". *Addiction* 106.5 (2011): 906-914.
4. Schuckit MA. "Alcohol-use disorders". *Lancet* 373.9662 (2009): 492-501.
5. Wood E., *et al*. "Will This Hospitalized Patient Develop Severe Alcohol Withdrawal Syndrome?: The Rational Clinical Examination Systematic Review". *Journal of the American Medical Association* 320.8 (2018): 825-833.
6. Eloma AS., *et al*. "Evaluation of the appropriate use of a CIWA-Ar alcohol withdrawal protocol in the general hospital setting". *American Journal of Drug and Alcohol Abuse* 44.4 (2018): 418-425.
7. Erol A and Karpyak VM. "Sex and gender-related differences in alcohol use and its consequences: Contemporary knowledge and future research considerations". *Drug and Alcohol Dependence* 156 (2015): 1-13.
8. Campollo O. "Alcohol and the Liver: The Return of the Prodigal Son". *Annals of Hepatology* 18.1 (2019): 6-10.
9. Bailey KL., *et al*. "Alcohol use disorder: A pre-existing condition for COVID-19?" *Alcohol* 90 (2021): 11-17.
10. Engler PA., *et al*. "Alcohol use of diabetes patients: the need for assessment and intervention". *Acta Diabetologica* 50.2 (2013): 93-99.
11. Gowin JL., *et al*. "Vulnerability for Alcohol Use Disorder and Rate of Alcohol Consumption". *American Journal of Psychiatry* 174.11 (2017): 1094-1101.
12. Aghdassi AA., *et al*. "Genetic susceptibility factors for alcohol-induced chronic pancreatitis". *Pancreatology* 15.4 (2015): S23-S31.
13. González-Reimers E., *et al*. "Alcoholism: a systemic proinflammatory condition". *World Journal of Gastroenterology* 20.40 (2014): 14660-14671.
14. Farris SP and Miles MF. "Ethanol modulation of gene networks: implications for alcoholism". *Neurobiology of Disease* 45.1 (2012): 115-121.
15. Schuckit MA. "Studies of populations at high risk for alcoholism". *Psychiatric Developments* 3.1 (1985): 31-63.
16. da Costa MZ., *et al*. "Genetic risk for alcoholic chronic pancreatitis". *International Journal of Environmental Research and Public Health* 8.7 (2011): 2747-2757.
17. Schuckit MA. "Genetics and the risk for alcoholism". *Journal of the American Medical Association* 254.18 (1985): 2614-2617.
18. de la Monte SM and Kril JJ. "Human alcohol-related neuropathology". *Acta Neuropathologica* 127.1 (2014): 71-90.
19. Le Daré B., *et al*. "Ethanol and its metabolites: update on toxicity, benefits, and focus on immunomodulatory effects". *Drug Metabolism Reviews* 51.4 (2019): 545-561.
20. World Health Organization. The global burden of disease: 2004 update. Geneva, WHO (2008).
21. United Nations Department of Economic and Social Affairs/Population Division. 2009. World Population Prospects (2008).

22. World Health Organization. Average daily ambient ultraviolet radiation (UVR) level. World Health Data Platform/GHO/Indicator Metadata Registry List Average daily ambient ultraviolet radiation (UVR) level (2004).

23. World Population Prospects United Nations. 2005-2010.

24. Bhaven N Sampat. "Academic Patents and Access to Medicines in Developing Countries". *American Journal of Public Health* 99.1 (2009): 9-17.

25. Gross National Happiness Commission. Royal Government of Bhutan.

26. Global Health Observatory (GHO) data Indicator and Measurement Registry version 1.7.0 BMI ≥ 25 total cholesterol ≥ 5.0 blood glucose ≥ 7.0 insufficiently active. 2008 // WHO (World Health Organization) Percentage of defined population Program Country (2008).

27. Food and Agriculture Organization of the United Nations. Food Balance Sheets 2003-05.

28. Treskov VG., *et al*. "[Clinical pharmacokinetics of mebikar. Computation of individual dosage regimens]". *Farmakologiia i Toksikologiia* 48.1 (1985): 46-48.

29. Treskov VG., *et al*. "[Plasma levels of biogenic amines in patients with various forms of the alcohol abstinence syndrome]". *Zhurnal Nevropatologii i Psikhiatrii Imeni S.S. Korsakova* 89.2 (1989): 109-111.

30. Radkevich LA and Radkevich DA. "Comparative Analysis of Economic, Geographic, Social and Nutritional Risk Factors 4 Types of Non-Communicable Chronic Diseases (Melanoma, Multiple Sclerosis, Diabetes Mellitus and Hypertensive Heart Disease) in the Mediterranean and Caribbean Countries (Population Study)". *Journal of Obesity and Chronic Diseases* 4.2 (2020): 51-58.

31. Ludmila Radkevich and Dariya Radkevich. "Can Alcohol and Obesity be Considered Risk Factors for Diabetes Mellitus? (environmental study)". *Current Research in Diabetes and Obesity Journal* 15.1 (2021): 555905.

32. Lyudmila Alexandrovna Radkevich and Dariya Andreyevna Radkevich. "Analysis of the Burden of Cardiovascular Morbidity in Countries with High and Low Levels of Daily Food Consumption". *Online Journal of Cardiology Research and Reports* (2021).

33. Lyudmila Alexandrovna Radkevich and Dariya Andreyevna Radkevich. "Dietary Patterns and Economic and Geographic Risk Factors for the Burden of Diabetes Mellitus (Observational Study)". *EC Diabetes and Metabolic Research* 5.4 (2021): 82-96.

34. Radkevich LA., *et al*. "Mortality from suicide and alcoholism, depending on the level of alcohol consumption". *Research and Practical Medicine Journal* 4.1 (2017): 33-39.

35. Angela M Wood., *et al*. "Risk thresholds for alcohol consumption: combined analysis of individual-participant data for 599 912 current drinkers in 83 prospective studies". *The Lancet* 391.10129 (2018): 1513-1523.

36. Kalinowski A and Humphreys K. "State standard definitions and recommendations for use low-risk alcohol in 37 countries". *Addiction* 111.7 (2016): 1293-1298.

37. Thun MJ., *et al*. "Alcohol consumption and mortality among middle-aged and elderly U.S. adults". *New England Journal of Medicine* 337.24 (1997): 1705-1714.

38. Mukamal K., *et al*. "Roles of drinking pattern and type of alcohol consumed in coronary heart disease in men". *New England Journal of Medicine* 348.2 (2003): 109-118.

39. Stampfer MJ., *et al*. "A prospective study of moderate alcohol consumption and the risk of coronary disease and stroke in women". *New England Journal of Medicine* 319.5 (1988): 267-273.

40. Boffetta P and Garfinkel L. "Alcohol use and mortality among men included in a prospective study by the American Cancer Society". *Epidemiology* 1.5 (1990): 342-348.

41. Verbrugge LM and Wingard DL. "Sex differentials in health and mortality". *Women and Health* 12.2 (1987): 103-145.

42. Waldron I. "What do we know about causes of sex differences in mortality? A review of the literature". *Population Bulletin of the United Nations* 18 (1985): 59-76.

43. Verbrugge LM and Wingard DL. "Sex differentials in health and mortality". *Women and Health* 12.2 (1987): 103-145.

44. Trias-Llimós S and Janssen F. "Alcohol and gender gaps in life expectancy in eight Central and Eastern European countries". *The European Journal of Public Health* 28.4 (2018): 687-692.

45. Koob GF. "Neurocircuitry of alcohol addiction: synthesis from animal models". *Handbook of Clinical Neurology* 125 (2014): 33-54.

46. Comings DE and Blum K. "Reward deficiency syndrome: genetic aspects of behavioral disorders". *Progress in Brain Research* 126 (2000): 325-341.

47. Lucey MR. "Alcohol-Associated Cirrhosis". *Clinical Liver Disease* 23.1 (2019): 115-126.

48. Ludmila Radkevich and Dariya Radkevich. "Comparative Analysis of Risk Factors for Liver Cirrhosis in the World". *Academic Journal of Gastroenterology and Hepatology* 3.2 (2021): AJGH.MS.ID.000557.

49. Ludmila Alexandrovna Radkevich and Dariya Andreyevna Radkevich. "2004 Study of Risk Factors for an Increasing Gradient in the Burden of Liver Cirrhosis in 158 Countries in Men and Women". *Acta Scientific Gastrointestinal Disorders* 5.3 (2020): 19-40.

50. Baecker A., *et al*. "The trends in incidence of primary liver cancer caused by specific etiologies: Results from the Global Burden of Disease Study 2016 and implications for liver cancer prevention. Worldwide incidence of hepatocellular carcinoma cases attributable to major risk factors". *European Journal of Cancer Prevention* 27.3 (2018): 205-212.

51. Nyberg AH., *et al*. "Increased cancer rates in patients with chronic hepatitis C". *Liver International* 40.3 (2020): 685-693.

52. Global Burden of Disease Liver Cancer Collaboration., *et al*. "The Burden of Primary Liver Cancer and Underlying Etiologies From 1990 to 2015 at the Global, Regional, and National Level: Results from the Global Burden of Disease Study 2015". *JAMA Oncology* 3.12 (2017): 1683-1691.

53. Fattovich G., *et al*. "Hepatocellular carcinoma in cirrhosis: incidence and risk factors". *Gastroenterology* 127.5 (2004): S35-S50.

Volume 11 Issue 3 March 2023