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Research Article

Metabolic Syndrome Predictors and Cancer Incidence against the Backdrop of a Rising Gradient in the Burden of Alcoholism in Men in 160 Countries 2004

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Abstract

Objective: To study the risk factors for the burden of cancer and predictors of the metabolic syndrome against the background of the gradient of alcoholism in 160 countries of the world 2004.

Materials and Methods: For the purposes of the study, a database of 160 countries on the burden of alcoholism, 14 types of cancer (ICD-10 codes) and 8 predictors of metabolic syndrome were created. Burden of disease (DALY) data for men in 160 countries, standardized by sex and age, were selected from the 2004 GBD database. The U-Mann-Whitney-Wilcoxon test was used for data analysis.

Results: The study found a statistically significant 23-fold increase in the burden of alcoholism across 8 groups in 160 countries. Burden of 9 types of cancer (a - Trachea, bronchus, lung cancers, Stomach cancer and Colon and rectum cancers; b - Prostate cancer, Leukaemia and Pancreas cancer; c - Oesophagus cancer, Melanoma and other skin cancers, and Breast cancer) in 8 groups of countries increased by 1.5 - 3 times in parallel with the growth of the alcoholism gradient, the increase in the consumption of strong alcohol, cigarettes and animal products. The burden of 5 types of cancer (d - Liver cancer, Lymphomas, multiple myeloma, Mouth and oropharynx cancers, Bladder cancer and other neoplasms) decreased by 3 - 4 times as the alcoholism gradient increased and was associated with viral infections. In parallel with the growth of the alcoholism gradient in countries, the characteristics of 8 types of metabolic syndrome predictors increased by 1.5 - 3 times: overweight and obesity (BMI ≥ 25 and 30 kg/m^2), hyperlipidemia (≥ 5 and 6.2 mmol/L), hyperglycemia (≥ 7 mmol/L), blood pressure (≥ 140/90 mm Hg, without pharmacological correction and with correction) and low physical activity (≤ 60 min/day). The life expectancy of men was not statistically significantly different at the minimum and maximum burden of alcoholism.

However, the gender difference in life expectancy between men and women increased statistically significantly from 1st group of countries to 8th group of countries from 3 to 7 years. This was indicative of the loss of male LE as the alcoholism gradient increased.

Conclusion: The results show an increase in risk factors for the burden of 9 types of cancer and 8 types of predictors of metabolic syndrome in parallel with the increase in the alcoholism gradient in 180 countries.

Keywords: *Alcoholism Gradient; Burden of 14 Types of Cancer; 8 Predictors of Metabolic Syndrome; Levels of Alcohol; Tobacco; Food Consumption; The Quality of Life*

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 International 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

Cancer and alcoholism are growing non-communicable diseases (NCDs) and represent a public health problem in the world [1,2]. Gastrointestinal cancer accounts for 26% of global cancer incidence and 35% of all cancer-related deaths [3,4]. Heavy drinkers had a higher risk of cancer of the stomach, liver, gallbladder, pancreas and lung, melanoma, prostate cancer, cancer of the mouth, pharynx, esophagus, colon, and breast in women. The effect of alcohol on other types of cancer remains controversial. Alcohol consumption and the risk of developing lymphoma were inversely related [1-6]. Metabolic syndrome, obesity, type II diabetes, alcoholic and non-alcoholic fatty liver disease can become the main cause of hepatocarcinoma worldwide [7-10]. The frequency of ejaculation may be inversely related to the risk of prostate cancer [11]. Oral cancer is one of the 10 most common types of cancer in the world with late clinical detection [12-15]. The incidence of kidney cancer is on the rise worldwide. The highest rates are observed in developed countries. Tobacco smoking, obesity and hypertension remain important risk factors for kidney cancer. The consumption of processed red meat is associated with an increase in renal cell cancer. Fiber-rich fruits and vegetables, coffee and physical activity have a protective effect against kidney cancer. But causal inferences have yet to be confirmed. There is growing evidence of an inverse association between moderate alcohol consumption and kidney cancer [16,17]. 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. The positive effects of alcohol are questioned because for the lack of a threshold for safe drinking [18].

The 2018 world cancer

Research Foundation/American Institute for Cancer Research report Diet, Nutrition, Physical Activity, and Cancer: A Global Perspective provides evidence of cancer growth worldwide [19]. Third Expert Report on Diet, Nutrition, physical activity and cancer, prepared by the World Cancer Research Foundation and the American Institute for Cancer Research, represents the most comprehensive and objective analysis of the accumulated data [20,21]. Understanding the relationship between nutrition and epigenetics (the control of gene expression through chromatin structure) is critical in light of the influence of diet in the early stages of breast cancer. The main dietary factors are high body weight and alcohol consumption [22]. There is a well-known link between depression, anxiety and cancer. The analysis showed that depression and anxiety are associated with higher cancer incidence, worse survival, and higher cancer mortality [23]. Metabolic syndrome is associated with age-related cognitive decline. On a large, ethnically homogeneous sample, the association of the metabolic syndrome with regional differences in the volume of the gray matter of the brain has been established. Structures with lower gray matter volume in the metabolic syndrome reflected significant involvement in reward perception, emotional valence, and reasoning. It is necessary to study the influence of the components of the metabolic syndrome on the structure of the brain [24]. The metabolic syndrome is

prevalent in developed nations and accounts for the largest burden of non-communicable diseases worldwide. The metabolic syndrome has direct effects on health and increases the risk of developing cancer [25]. Caloric excess and sedentary lifestyle have led to a global epidemic of obesity and metabolic syndrome. The hepatic consequence of metabolic syndrome and obesity, nonalcoholic fatty liver disease (NAFLD), is estimated to affect up to one-third of the adult population in many developed and developing countries [26]. Many likely modifiable risk factors have not yet been established as causal relationships [27].

Objective of the Study

To investigate alcohol risk factors for the burden of cancer and predictors of the metabolic syndrome against the background of the alcoholism gradient in 160 countries.

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, 14 types cancer (ICD-10 codes) and 8 predictors of metabolic syndrome was created. Burden of disease (DALY) data for men in 160 countries, standardized by sex and age, were selected from the 2004 GBD database [28] (Table 1 and 2).

160 countries were divided into 8 groups of 20 countries in each group. The burden of alcoholism increased from group 1 to group 8 (Table 2. 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 [29]; geographical position of countries by latitude and level of ultraviolet radiation in the capital (UV) (J/m^2 2004) [30]; Life expectancy for men and women (LE) [31] and [Internet resources]; access to good health care, clean water and clean air [32]; Happiness Indices (HI), Gini; prosperity; education; personal capital; Corruption; peacefulness; Human Development; Environmental efficiency [33] 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 [34].

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 [35]. 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) [35]. 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 Bonferoni 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 DALY), Libyan (9 DALY) and Kuwait (10 DALY), respectively. The maximum burden of alcoholism was noted in 3 countries of the 8th group: Republic of Moldova (2020 DALY), Hungary (2204 DALY) and Russian Federation (2430 DALY), respectively (Table 1 and 2).

Variable	Mann-Whitney U Test (w/ continuity correction) (Spreadsheet1_(Recovered)) By variable RANG Marked tests are significant at p <,05000									
	U	p-value	Mean	Median	Quartile	Std.Dev.	Mean 8	Median 8	Quartile 8	Std.Dev.8
IPC 2000	112,00	0,01794	11877	1929	5808	21778	10098	7054	5258	8913
Gini Index 2021	144,00	0,20110	0,729	0,732	0,071	0,053	0,746	0,770	0,131	0,093
lat°	105,00	0,01058	20	15	16	11	37	45	40	21
UV rad J/m^2 2004	75,50	0,00080	4920	5332	1328	956	3142	2084	3178	1677
lon°	131,50	0,06586	40	33	34	47	56	54	58	34
Prosperity Rating	98,00	0,00604	90	98	45	34	59	61	40	32
Rating Educations	94,00	0,00432	90	89	61	39	54	47	47	34
Rating of the Social capital	147,00	0,15557	81	72	63	36	63	61	55	36
Rank of corruption 2016	148,50	0,16772	101	102	66	42	80	85	76	47
Rating of peacefulness	98,00	0,29619	96	101	56	35	79	88	66	43
HPI 2016	84,00	0,01469	5	4	2	1	6	6	1	1
Index of human development	91,00	0,00334	1	1	0	0	1	1	0	0
EEI Ecological efficiency index	101,00	0,02109	43	36	33	18	56	53	16	14
Access to the street. medicine1990	99,00	0,03167	70	72	44	26	89	93	18	12
Access to clean water1990	96,50	0,04097	50	35	80	39	78	84	34	23
Air pollution for children under 5 years old 2004	43,50	0,00004	209	145	204	224	23	3	24	45
CCR5 rs333-	37,00	0,00322	0,009	0,003	0,010	0,014	0,080	0,110	0,125	0,063
Female life expectancy	63,50	0,00224	71	74	13	8	78	78	4	4
Male life expectancy	131,50	0,37272	67	69	14	8	70	70	6	5
Gender LE 2019	17,50	0,00001	3	3	2	1	8	7	4	2
Men Death	155,00	0,22870	1345	1362	778	568	1137	1009	555	382

Infectious and parasitic diseases	121,00	0,03372	6683	4805	10313	6310	2200	1644	1998	2713
Noncommunicable diseases	187,00	0,73527	13275	14169	2698	2580	14007	13100	4092	3220
Malignant neoplasms	123,00	0,03852	1225	1309	465	354	1616	1691	985	526
Mouth and oropharynx cancers	173,00	0,47348	70	79	33	31	88	80	113	65
Oesophagus cancer	131,00	0,06389	53	28	28	64	56	52	38	38
Stomach cancer	64,00	0,00025	83	70	41	57	203	216	135	97
Colon and rectum cancers	101,00	0,00771	74	63	32	33	138	143	128	78
Liver cancer	116,00	0,02390	215	158	229	195	97	53	48	124
Pancreas cancer	79,00	0,00112	28	26	8	14	67	81	66	37
Trachea, bronchus, lung cancers	77,00	0,00092	127	86	82	91	339	347	388	207
Melanoma and other skin cancers	124,00	0,04112	12	9	12	9	21	24	23	15
Breast cancer	111,00	0,01667	0	0	0	0	1	0	1	2
Prostate cancer	163,00	0,32348	121	86	112	104	121	129	77	56
Bladder cancer	147,00	0,15557	79	58	50	77	44	44	38	23
Lymphomas, multiple myeloma	88,00	0,00256	125	116	64	55	78	81	40	29
Leukaemia	142,00	0,11986	73	54	57	45	86	89	38	30
Other neoplasms	66,00	0,00030	59	52	31	45	24	23	11	13
Alcohol use disorders	-	0,00000	57	60	54	32	1547	1 400	428	296
Male BMI > 25 (kg/m^2)	145,00	0,14042	39	32	45	25	52	56	19	12
Male BMI > 30(kg/m^2)	144,00	0,13328	14	8	20	13	17	19	12	7
Male ch > 5.0 (mmol/L)	85,00	0,00195	31	30	17	15	45	46	18	12
Male ch > 6.2 (mmol/L)	81,00	0,00135	7	6	4	5	12	12	8	5
Male glu > 7.0 (mmol/L)	157,50	0,25591	10	8	5	4	10	11	3	2
Male AD1 > 140/90 (mm Hg)	130,00	0,06011	30	33	9	7	36	37	16	9
Male AD2 > 140/90 (mm Hg)	112,50	0,01861	39	41	7	6	45	46	14	8
Beverages, Alcoholic 2003-05	18,50	0,00000	1	0,000	1	2	19	15	17	15
Wine 2003-05	78,00	0,00173	7	0,000	1	30	12	12	17	11
Beer 2003-05	33,50	0,00001	13	6	10	20	108	84	111	78

Ba/wine	89,00	0,00280	0	0	0	1	2	1	2	3
Red m/Gl	111,00	0,01667	0	0	0	0	0	0	0	0
Fat a/ Oil v	110,50	0,01606	0	0	1	1	1	0	1	1
TCL g/person/day	90,00	0,00306	1078	869	979	576	1675	1738	985	558
AP amount	89,00	0,00280	310	258	303	190	555	557	400	241
GV amount	129,00	0,05652	621	477	532	346	800	799	488	271
FD amount	120,00	0,03152	115	117	134	79	171	166	73	72
AB amount	20,50	0,00000	21	6	13	48	138	111	135	90
AP Energy%2003-05	73,00	0,00062	12	10	10	7	22	23	13	8
AP Protein%2003-05	80,00	0,00123	31	28	23	14	47	49	15	12
AP Fat%2003-05	38,50	0,00001	27	25	18	13	51	56	18	12
Carboh%E 2003-05	158,00	0,26162	65	67	8	7	63	63	12	7
Proteins%E 2003-05	164,00	0,33692	11	11	1	1	11	11	2	1
Fats%E 2003-05	157,50	0,25591	25	23	8	7	26	26	11	7
Energy (kcal/person/ day)2003-05	145,50	0,14410	2597	2680	905	564	2815	2865	595	408
mDailyAge cigarette smoking	46,00	0,05376	23	15	16	18	38	38	24	17
2 and 8 groups										
Variable	**Mann-Whitney U Test (w/ continuity correction) (Spreadsheet1_(Recovered)) By variable RANG Marked tests are significant at p <,05000**									
	U	**p-value**	**Mean**	**Median**	**Quartile**	**Std.Dev.**	**Mean 8**	**Median 8**	**Quartile 8**	**Std.Dev.8**
IPC 2000	94,00	0,0043	7013	2074	4889	14544	10098	7054	5258	8913
Gini Index 2021	146,50	0,3281	0,736	0,722	0	0	1	1	0	0
lat°	106,50	0,0119	21	19	25	13	37	45	40	21
UV rad J/m^2 2004	113,00	0,0193	4462	4709	1326	891	3142	2084	3178	1677
lon°	135,00	0,0810	36	32	28	29	56	54	58	34
Prosperity Rating	65,00	0,0003	102	105	57	31	59	61	40	32
Rating Educations	70,00	0,0005	98	101	55	32	54	47	47	34
Rating of the Social capital	87,50	0,0024	99	116	59	36	63	61	55	36
Rank of corruption 2016	88,50	0,0045	123	133	42	37	80	85	76	47
Rating of peacefulness	114,00	0,2038	97	105	79	43	79	88	66	43
HPI 2016	31,00	0,0002	5	4	1	1	6	6	1	1
Index of human development	57,00	0,0001	0,596	0,543	0	0	1	1	0	0
EEI Ecological efficiency index	92,00	0,0062	41	40	23	16	56	53	16	14

Access to the street. medicine1990	68,50	0,0056	68	75	42	23	89	93	18	12
Access to clean water1990	41,00	0,0021	39	27	56	32	78	84	34	23
Air pollution for children under 5 years old 2004	54,50	0,0001	181	128	278	174	23	3	24	45
CCR5 rs333-	46,00	0,0062	0	0	0	0	0	0	0	0
Female life expectancy	77,00	0,0027	68	67	17	10	78	78	4	4
Male life expectancy	123,00	0,0986	64	64	17	10	70	70	6	5
Gender 2019	44,50	0,0001	4	3	3	2	8	7	4	2
Men Death	116,00	0,0239	1585	1606	1236	664	1137	1009	555	382
Infectious and parasitic diseases	96,00	0,0051	11105	8939	19019	10400	2200	1644	1998	2713
Noncommunicable diseases	191,00	0,8181	13309	13203	2365	2142	14007	13100	4092	3220
Malignant neoplasms	117,00	0,0256	1251	1234	606	355	1616	1691	985	526
Mouth and oropharynx cancers	183,00	0,6554	92	30	51	62	88	80	113	65
Oesophagus cancer	172,00	0,4570	78	30	96	100	56	52	38	38
Stomach cancer	68,00	0,0004	90	58	65	81	203	216	135	97
Colon and rectum cancers	82,00	0,0015	63	53	56	49	138	143	128	78
Liver cancer	163,00	0,3235	225	107	326	256	97	53	48	124
Pancreas cancer	64,00	0,0002	24	22	15	16	67	81	66	37
Trachea, bronchus, lung cancers	108,00	0,0133	164	140	113	109	339	347	388	207
Melanoma and other skin cancers	122,00	0,0360	13	6	16	14	21	24	23	15
Breast cancer	111,00	0,0167	0	0	0	0	1	0	1	2
Prostate cancer	172,00	0,4570	129	89	152	122	121	129	77	56
Bladder cancer	198,00	0,9676	46	54	30	23	44	44	38	23
Lymphomas, multiple myeloma	103,00	0,0090	122	115	63	60	78	81	40	29
Leukaemia	86,00	0,0021	58	57	23	26	86	89	38	30
Other neoplasms	56,00	0,0001	67	50	37	57	24	23	11	13
Alcohol use disorders	-	0,0000	139	139	63	31	1547	1 400	428	296
Male BMI > 25 (kg/m^2)	72,00	0,0006	27	18	29	20	52	56	19	12
Male BMI > 30(kg/m^2)	72,00	0,0006	7	3	9	8	17	19	12	7
Male ch > 5.0 (mmol/L)	79,00	0,0011	30	26	17	13	45	46	18	12

Male ch > 6.2 (mmol/L)	79,00	0,0011	6	5	4	4	12	12	8	5
Male glu > 7.0 (mmol/L)	122,50	0,0373	8	8	3	2	10	11	3	2
Male AD1 > 140/90 (mm Hg)	143,50	0,1298	32	33	8	5	36	37	16	9
Male AD2 >140/90 (mm Hg)	130,50	0,0620	41	41	6	4	45	46	14	8
Male insact < 60 minutes/day walking	80,50	0,8576	26	27	19	16	28	23	16	10
Beverages, Alcoholic2003-05	37,50	0,0000	4	0,500	2	11	19	15	17	15
Wine2003-05	90,50	0,0054	6	0	3	22	12	12	17	11
Beer2003-05	47,00	0,0000	23	8	14	48	108	84	111	78
Ba/wine	97,50	0,0058	0	0	0	1	2	1	2	3
Fat a/Oil v	98,50	0,0063	0	0	0	0	1	0	1	1
TCL g/person/day	89,00	0,0028	1064	873	1036	627	1675	1738	985	558
AP amount	77,50	0,0010	279	188	306	228	555	557	400	241
GV amount	143,00	0,1264	630	551	643	385	800	799	488	271
FD amount	121,00	0,0337	110	60	150	93	171	166	73	72
AB amount	38,00	0,0000	33	12	27	70	138	111	135	90
AP Energy%2003-05	62,00	0,0002	10	7	11	8	22	23	13	8
AP Protein%2003-05	64,00	0,0002	28	26	21	15	47	49	15	12
AP Fat%2003-05	42,50	0,0000	27	26	24	14	51	56	18	12
Carboh%E 2003-05	126,50	0,0483	68	70	17	9	63	63	12	7
Proteins%E 2003-05	127,50	0,0515	10	10	2	2	11	11	2	1
Fats%E 2003-05	137,50	0,0935	22	22	14	8	26	26	11	7
Energy (kcal/person/day)2003-05	137,00	0,0909	2510	2335	1030	549	2815	2865	595	408
mDailyAgecigarette smoking	47,50	0,0216	22	21	19	13	38	38	24	17
3 and 8 groups										
Variable	**Mann-Whitney U Test (w/ continuity correction) (Spreadsheet1_(Recovered)) By variable RANG Marked tests are significant at p <,05000**									
	U	**p-value**	**Mean**	**Median**	**Quartile**	**Std.Dev.**	**Mean 8**	**Median 8**	**Quartile 8**	**Std.Dev.8**
IPC 2000	82,00	0,0015	4910	1889	2835	7565	10098	7054	5258	8913
Gini Index 2021	138,50	0,2257	0,722	0,730	0	0	1	1	0	0
lat°	81,00	0,0013	15	13	13	11	37	45	40	21

UV rad J/m^2 2004	83,00	0,0016	4870	5218	868	922	3142	2084	3178	1677
lon°	161,00	0,2977	48	33	47	47	56	54	58	34
Prosperity Rating	79,00	0,0011	96	105	49	32	59	61	40	32
Rating Educations	72,00	0,0006	98	105	54	35	54	47	47	34
Rating of the Social capital	119,00	0,0294	87	85	38	26	63	61	55	36
Rank of corruption 2016	149,00	0,3726	94	90	81	48	80	85	76	47
Rating of peacefulness	123,00	0,4794	90	92	79	45	79	88	66	43
HPI 2016	45,00	0,0002	5	4	1	1	6	6	1	1
Index of human development	53,00	0,0001	0,600	0,553	0	0	1	1	0	0
EEI Ecological efficiency index	65,00	0,0005	41	39	13	12	56	53	16	14
Access to the street. medicine1990	53,50	0,0004	61	56	36	23	89	93	18	12
Access to clean water1990	47,50	0,0005	35	27	32	31	78	84	34	23
Air pollution for children under 5 years old 2004	77,00	0,0016	230	73	414	329	23	3	24	45
CCR5 rs333-	40,00	0,0028	0	0	0	0	0	0	0	0
Female life expectancy	58,50	0,0001	67	64	11	9	78	78	4	4
Male life expectancy	82,00	0,0015	62	61	11	8	70	70	6	5
gender LE 2019	51,50	0,0001	4	4	2	2	8	7	4	2
Men Death	94,00	0,0043	1733	1948	1052	694	1137	1009	555	382
Infectious and parasitic diseases	61,00	0,0002	13966	16528	15670	10014	2200	1644	1998	2713
Noncommunicable diseases	199,00	0,9892	13624	14084	3630	2960	14007	13100	4092	3220
Malignant neoplasms	148,00	0,1636	1346	1406	459	343	1616	1691	985	526
Mouth and oropharynx cancers	143,00	0,1264	117	108	89	63	88	80	113	65
Oesophagus cancer	185,00	0,6949	89	49	92	93	56	52	38	38
Stomach cancer	76,00	0,0008	98	82	78	83	203	216	135	97
Colon and rectum cancers	101,00	0,0077	74	66	40	42	138	143	128	78
Liver cancer	101,00	0,0077	206	176	170	166	97	53	48	124
Pancreas cancer	85,00	0,0020	29	24	21	22	67	81	66	37
Trachea, bronchus, lung cancers	95,00	0,0047	155	115	99	129	339	347	388	207

Melanoma and other skin cancers	195,00	0,9031	20	14	21	15	21	24	23	15
Breast cancer	120,00	0,0315	0	0	0	1	1	0	1	2
Prostate cancer	146,00	0,1478	171	180	208	119	121	129	77	56
Bladder cancer	196,00	0,9246	50	36	52	40	44	44	38	23
Lymphomas, multiple myeloma	118,00	0,0275	114	101	54	50	78	81	40	29
Leukaemia	83,00	0,0016	56	52	28	31	86	89	38	30
Other neoplasms	66,00	0,0003	43	39	27	19	24	23	11	13
Alcohol use disorders	-	0,0000	230	232	30	20	1547	1 400	428	296
Male BMI > 25 (kg/m^2)	61,00	0,0002	27	20	17	19	52	56	19	12
Male BMI > 30 (kg/m^2)	62,00	0,0002	7	4	4	8	17	19	12	7
Male ch > 5.0 (mmol/L)	57,50	0,0001	27	25	15	12	45	46	18	12
Male ch > 6.2 (mmol/L)	52,50	0,0001	5	4	4	4	12	12	8	5
Male glu > 7.0 (mmol/L)	101,50	0,0080	8	7	2	2	10	11	3	2
Male AD1 > 140/90 (mm Hg)	135,00	0,0810	31	31	4	5	36	37	16	9
Male AD2 > 140/90 (mm Hg)	128,00	0,0531	40	40	3	4	45	46	14	8
Male insact <60 minutes/day walking	67,00	0,2541	26	18	24	18	28	23	16	10
Beverages, Alcoholic2003-05	41,00	0,0000	3	1,000	2	6	19	15	17	15
Wine2003-05	86,00	0,0061	3	1	3	5	12	12	17	11
Beer2003-05	71,00	0,0005	33	19	42	34	108	84	111	78
Ba/wine	124,00	0,0411	1	0	0	1	2	1	2	3
Red m/Gl	102,00	0,0084	0	0	0	0	0	0	0	0
Fat a/Oil v	98,50	0,0063	1	0	0	2	1	0	1	1
TCL g/person/day	64,50	0,0003	892	630	517	579	1675	1738	985	558
AP amount	57,00	0,0001	231	145	194	165	555	557	400	241
GV amount	75,00	0,0008	499	429	242	316	800	799	488	271
FD amount	53,00	0,0001	72	51	66	68	171	166	73	72
AB amount	48,00	0,0000	38	20	42	39	138	111	135	90
AP Energy%2003-05	47,00	0,0000	10	8	8	6	22	23	13	8
AP Protein%2003-05	58,50	0,0001	28	26	18	13	47	49	15	12
AP Fat%2003-05	33,50	0,0000	26	27	16	12	51	56	18	12
Carboh%E 2003-05	122,00	0,0360	68	69	9	7	63	63	12	7
Proteins%E 2003-05	168,50	0,4017	11	11	3	2	11	11	2	1

Fats%E 2003-05	121,50	0,0349	22	21	8	6	26	26	11	7
Energy (kcal/person/day)2003-05	93,00	0,0040	2395	2335	645	477	2815	2865	595	408
mDailyAgecigarette smoking	50,50	0,0184	21	15	26	15	38	38	24	17
4 and 8 groups										
Variable	**Mann-Whitney U Test (w/ continuity correction) (Spreadsheet1_(Recovered)) By variable RANG Marked tests are significant at p <,05000**									
	U	**p-value**	**Mean**	**Median**	**Quartile**	**Std.Dev.**	**Mean 8**	**Median 8**	**Quartile 8**	**Std.Dev.8**
IPC 2000	129,00	0,0565	7447	4127	10148	8566	10098	7054	5258	8913
Gini Index 2021	107,50	0,0343	0,697	0,681	0,073	0,060	0,746	0,770	0,131	0,093
lat°	124,00	0,0411	25	31	31	17	37	45	40	21
UV rad J/m^2 2004	137,00	0,0909	3929	3719	1979	1155	3142	2084	3178	1677
Prosperity Rating	144,00	0,1333	75	72	38	36	59	61	40	32
Rating Educations	133,00	0,0720	72	72	49	33	54	47	47	34
Rating of the Social capital	199,00	0,9892	64	72	72	42	63	61	55	36
Rank of corruption 2016	157,00	0,2503	98	101	96	53	80	85	76	47
Rating of peacefulness	137,50	0,8360	82	89	42	36	79	88	66	43
HPI 2016	92,00	0,0062	5	5	1	1	6	6	1	1
Index of human development	113,50	0,0200	1	1	0	0	1	1	0	0
EEI Ecological efficiency index	133,00	0,1124	48	46	22	15	56	53	16	14
Access to the street. medicine1990	100,00	0,2010	77	80	35	23	89	93	18	12
Access to clean water1990	107,50	0,2087	64	79	53	31	78	84	34	23
Air pollution for children under 5 years old 2004	109,50	0,0246	124	51	184	203	23	3	24	45
CCR5 rs333-	27,00	0,1731	0	0	0	0	0	0	0	0
Female life expectancy	112,50	0,0305	72	73	15	9	78	78	4	4
Male life expectancy	155,50	0,3394	68	68	13	9	70	70	6	5
Gender LE 2019	52,00	0,0001	5	4	2	2	8	7	4	2
Men Death	120,00	0,0315	1650	1392	1223	839	1137	1009	555	382
Infectious and parasitic diseases	134,00	0,0764	10459	2972	19494	14935	2200	1644	1998	2713

Noncommunicable diseases	199,00	0,9892	13651	13782	4227	3329	14007	13100	4092	3220
Malignant neoplasms	152,00	0,1988	1396	1412	546	419	1616	1691	985	526
Mouth and oropharynx cancers	196,00	0,9246	87	85	69	48	88	80	113	65
Oesophagus cancer	173,00	0,4735	93	57	130	85	56	52	38	38
Stomach cancer	108,00	0,0133	127	106	101	81	203	216	135	97
Colon and rectum cancers	130,00	0,0601	92	80	100	61	138	143	128	78
Liver cancer	179,00	0,5792	131	52	147	141	97	53	48	124
Pancreas cancer	129,00	0,0565	41	38	22	18	67	81	66	37
Trachea, bronchus, lung cancers	157,00	0,2503	252	198	172	195	339	347	388	207
Melanoma and other skin cancers	186,00	0,7150	21	18	14	19	21	24	23	15
Breast cancer	143,00	0,1264	0	0	0	1	1	0	1	2
Prostate cancer	186,00	0,7150	129	91	119	108	121	129	77	56
Bladder cancer	173,00	0,4735	55	47	23	31	44	44	38	23
Lymphomas, multiple myeloma	131,00	0,0639	106	100	52	48	78	81	40	29
Leukaemia	127,00	0,0499	68	68	42	33	86	89	38	30
Other neoplasms	138,00	0,0962	39	33	35	32	24	23	11	13
Alcohol use disorders	-	0,0000	345	349	75	49	1547	1 400	428	296
Male BMI > 25 (kg/m^2)	127,50	0,0515	40	41	34	19	52	56	19	12
Male BMI > 30 (kg/m^2)	130,00	0,0601	12	10	14	9	17	19	12	7
Male ch > 5.0 (mmol/L)	127,00	0,0499	35	30	26	16	45	46	18	12
Male ch > 6.2 (mmol/L)	129,50	0,0583	9	6	8	6	12	12	8	5
Male glu > 7.0 (mmol/L)	176,00	0,5250	9	10	4	3	10	11	3	2
Male AD1 >140/90 (mm Hg)	165,00	0,3507	34	34	6	5	36	37	16	9
Male AD2>140/90 (mm Hg)	165,00	0,3507	43	43	3	4	45	46	14	8
Male insact <60 minutes/day walking	38,00	0,0559	40	44	26	18	28	23	16	10
Beverages, Alcoholic2003-05	60,00	0,0002	5	4	8	5	19	15	17	15
Wine2003-05	157,00	0,3612	14	4	14	22	12	12	17	11
Beer2003-05	117,00	0,0256	64	31	82	79	108	84	111	78
AB amount	104,50	0,0102	83	38	112	98	138	111	135	90

Ba/wine	145,00	0,1404	1	0	1	2	2	1	2	3
Red m/Gl	147,00	0,1556	0	0	0	0	0	0	0	0
Fat a/Oil v	177,50	0,5518	1	1	1	1	1	0	1	1
TCL g/person/day	159,50	0,2793	1402	1487	1345	694	1675	1738	985	558
AP amount	149,00	0,1719	437	451	516	278	555	557	400	241
GV amount	175,50	0,5162	746	771	546	338	800	799	488	271
FD amount	124,50	0,0425	127	100	160	109	171	166	73	72
AB amount	104,50	0,0102	83	38	112	98	138	111	135	90
AP Energy%2003-05	140,00	0,1075	16	17	18	10	22	23	13	8
AP Protein%2003-05	129,50	0,0583	37	37	29	17	47	49	15	12
AP Fat%2003-05	148,00	0,1636	41	44	38	19	51	56	18	12
Carboh%E 2003-05	160,00	0,2853	66	66	10	9	63	63	12	7
Proteins%E 2003-05	178,50	0,5700	11	11	2	1	11	11	2	1
Fats%E 2003-05	149,00	0,1719	23	23	10	8	26	26	11	7
Energy (kcal/person/day)2003-05	152,50	0,2036	2612	2600	810	560	2815	2865	595	408
mDailyAgecigarette smoking	58,00	0,1148	28	24	20	14	38	38	24	17
5 and 8 groups	Medium drinkers strong alcohol									
Variable	**Mann-Whitney U Test (w/ continuity correction) (Spreadsheet1_(Recovered)) By variable RANG Marked tests are significant at p <,05000**									
	U	**p-value**	**Mean**	**Median**	**Quartile**	**Std.Dev.**	**Mean 8**	**Median 8**	**Quartile 8**	**Std.Dev.8**
IPC 2000	196,00	0,9246	11746	8325	14939	10397	10098	7054	5258	8913
Gini Index 2021	124,00	0,1577	1	1	0	0	1	1	0	0
lat°	152,50	0,2036	29	28	23	17	37	45	40	21
UV rad J/m^2 2004	153,00	0,2085	3585	4121	2411	1360	3142	2084	3178	1677
Prosperity Rating	179,00	0,7680	55	55	45	30	59	61	40	32
Rating Educations	166,00	0,5091	59	59	51	30	54	47	47	34
Rating of the Social capital	189,00	0,9888	62	67	47	34	63	61	55	36
Rank of corruption 2016	183,00	0,8551	78	69	80	47	80	85	76	47
Rating of peacefulness	145,00	0,6016	68	66	104	51	79	88	66	43
HPI 2016	120,00	0,1939	6	5	2	1	6	6	1	1

Index of human development	188,00	0,9664	1	1	0	0	1	1	0	0
EEI Ecological efficiency index	159,00	0,5398	58	55	33	17	56	53	16	14
Access to the street. medicine1990	145,50	0,6233	83	88	30	20	89	93	18	12
Access to clean water1990	140,00	0,6799	70	83	42	34	78	84	34	23
Air pollution for children under 5 years old 2004	183,50	0,6652	33	4	46	48	23	3	24	45
CCR5 rs333-	71,00	0,0552	0	0	0	0	0	0	0	0
Female life expectancy	192,00	0,8392	77	78	11	6	78	78	4	4
Male life expectancy	164,50	0,3438	72	71	10	6	70	70	6	5
Gender LE 2019	87,00	0,0023	5	5	2	2	8	7	4	2
Men Death	194,00	0,8817	2482	1128	680	4351	1137	1009	555	382
Infectious and parasitic diseases	195,00	0,9031	3114	1605	2756	5140	2200	1644	1998	2713
Noncommunicable diseases	158,00	0,2616	12601	13353	4570	2964	14007	13100	4092	3220
Malignant neoplasms	150,00	0,1806	1383	1395	433	346	1616	1691	985	526
Mouth and oropharynx cancers	175,00	0,5075	110	81	127	87	88	80	113	65
Oesophagus cancer	172,00	0,4570	76	51	68	64	56	52	38	38
Stomach cancer	109,00	0,0144	125	89	110	77	203	216	135	97
Colon and rectum cancers	171,00	0,4408	121	109	99	66	138	143	128	78
Liver cancer	192,00	0,8392	80	61	52	70	97	53	48	124
Pancreas cancer	123,00	0,0385	45	39	43	28	67	81	66	37
Trachea, bronchus, lung cancers	172,00	0,4570	287	281	169	139	339	347	388	207
Melanoma and other skin cancers	166,00	0,3648	19	14	18	19	21	24	23	15
Breast cancer	197,00	0,9461	1	0	2	1	1	0	1	2
Prostate cancer	144,00	0,1333	98	88	96	73	121	129	77	56
Bladder cancer	170,00	0,4249	38	32	35	23	44	44	38	23
Lymphomas, multiple myeloma	193,00	0,8604	85	78	35	33	78	81	40	29
Leukaemia	157,00	0,2503	77	78	29	30	86	89	38	30
Other neoplasms	190,00	0,7972	25	21	11	19	24	23	11	13

Alcohol use disorders	-	0,0000	570	570	150	76	1547	1 400	428	296
Male BMI > 25 (kg/m^2)	190,00	0,7972	45	58	43	23	52	56	19	12
Male BMI > 30 (kg/m^2)	184,00	0,6750	15	20	18	10	17	19	12	7
Male ch > 5.0 (mmol/L)	183,50	0,6652	43	42	27	16	45	46	18	12
Male ch > 6.2 (mmol/L)	181,00	0,6168	12	9	11	7	12	12	8	5
Male glu > 7.0 (mmol/L)	190,50	0,8077	10	11	3	2	10	11	3	2
Male AD1 > 140/90 (mm Hg)	130,50	0,0620	31	30	9	7	36	37	16	9
Male AD2 > 140/90 (mm Hg)	147,50	0,1595	42	42	8	6	45	46	14	8
Male insact <60 minutes/day walking	77,00	0,7196	28	25	22	15	28	23	16	10
Beverages, Alcoholic2003-05	117,00	0,0256	9	8,0	13	8	19	15,0	17	15
Wine2003-05	186,50	0,9328	26	4	32	41	12	12	17	11
Beer2003-05	164,00	0,3369	93	63	141	85	108	84	111	78
Ba/wine	150,00	0,1806	1	0	1	3	2	1	2	3
Red m/Gl	160,00	0,2853	0	0	0	0	0	0	0	0
Fat a/ Oil v	179,50	0,5885	1	0	0	1	1	0	1	1
TCL g/person/day	168,00	0,3942	1546	1545	902	543	1675	1738	985	558
AP amount	149,50	0,1762	458	425	409	261	555	557	400	241
GV amount	185,00	0,6949	779	751	255	240	800	799	488	271
FD amount	188,50	0,7660	170	140	162	99	171	166	73	72
AB amount	165,50	0,3577	129	78	184	120	138	111	135	90
AP Energy%2003-05	154,50	0,2235	19	18	16	10	22	23	13	8
AP Protein%2003-05	159,50	0,2793	41	43	29	17	47	49	15	12
AP Fat%2003-05	143,50	0,1298	44	43	19	14	51	56	18	12
Carboh%E 2003-05	188,00	0,7557	63	64	21	10	63	63	12	7
Proteins%E 2003-05	192,00	0,8392	11	11	2	2	11	11	2	1
Fats%E 2003-05	190,50	0,8077	26	26	18	9	26	26	11	7
Energy (kcal/person/day)2003-05	178,50	0,5700	2920	2880	795	493	2815	2865	595	408
mDailyAgecigarette smoking	89,00	0,1656	32	30	18	12	38	38	24	17
6 and 8 groups										

Variable	Mann-Whitney U Test (w/ continuity correction) (Spreadsheet1_(Recovered)) By variable RANG Marked tests are significant at p <,05000									
	U	p-value	Mean	Median	Quartile	Std.Dev.	Mean 8	Median 8	Quartile 8	Std.Dev.8
IPC 2000	138,00	0,0962	17903	11096	23115	14277	10098	7054	5258	8913
Gini Index 2021	159,00	0,3915	1	1	0	0	1	1	0	0
lat°	192,00	0,8392	39	47	19	17	37	45	40	21
UV rad J/m^2 2004	179,50	0,5885	2690	2024	1659	1394	3142	2084	3178	1677
Prosperity Rating	139,00	0,1017	40	38	60	29	59	61	40	32
Rating Educations	156,00	0,2393	40	42	60	30	54	47	47	34
Rating of the Social capital	167,50	0,3867	51	51	59	37	63	61	55	36
Rank of corruption 2016	128,00	0,0531	52	44	66	43	80	85	76	47
Rating of peacefulness	70,00	0,0065	41	37	45	29	79	88	66	43
HPI 2016	135,50	0,2875	6	7	1	1	6	6	1	1
Index of human development	127,00	0,0499	1	1	0	0	1	1	0	0
EEI Ecological efficiency index	146,00	0,2216	62	65	28	15	56	53	16	14
Access to the street. medicine1990	116,00	0,2283	91	99	16	15	89	93	18	12
Access to clean water1990	88,00	0,0871	89	100	21	19	78	84	34	23
Air pollution for children under 5 years old 2004	114,50	0,0215	7	0	1	17	23	3	24	45
CCR5 rs333-	63,50	0,3370	0	0	0	0	0	0	0	0
Female life expectancy	123,50	0,1016	80	81	5	4	78	78	4	4
Male life expectancy	91,00	0,0097	74	75	7	5	70	70	6	5
Gender LE2019	90,50	0,0093	6	6	2	1	8	7	4	2
Men Death	95,00	0,0047	826	744	319	264	1137	1009	555	382
Infectious and parasitic diseases	119,00	0,0294	882	250	1554	1112	2200	1644	1998	2713
Noncommunicable diseases	112,00	0,0179	11676	11220	3491	2441	14007	13100	4092	3220
Malignant neoplasms	179,00	0,5792	1725	1583	681	564	1616	1691	985	526
Mouth and oropharynx cancers	191,00	0,8181	79	68	65	41	88	80	113	65

Oesophagus cancer	189,00	0,7764	67	58	46	68	56	52	38	38
Stomach cancer	104,00	0,0098	131	90	96	118	203	216	135	97
Colon and rectum cancers	143,00	0,1264	174	178	112	81	138	143	128	78
Liver cancer	198,00	0,9676	133	55	53	314	97	53	48	124
Pancreas cancer	185,00	0,6949	67	72	40	26	67	81	66	37
Trachea, bronchus, lung cancers	164,00	0,3369	403	413	275	188	339	347	388	207
Melanoma and other skin cancers	140,00	0,1075	30	37	35	17	21	24	23	15
Breast cancer	110,00	0,0155	3	2	2	3	1	0	1	2
Prostate cancer	186,00	0,7150	141	127	57	86	121	129	77	56
Bladder cancer	190,00	0,7972	46	54	42	24	44	44	38	23
Lymphomas, multiple myeloma	183,00	0,6554	85	85	25	26	78	81	40	29
Leukaemia	129,00	0,0565	74	74	20	16	86	89	38	30
Other neoplasms	194,00	0,8817	28	23	30	19	24	23	11	13
Alcohol use disorders	-	0,0000	797	800	98	54	1547	1 400	428	296
Male BMI > 25 (kg/m^2)	118,00	0,0275	60	62	12	10	52	56	19	12
Male BMI > 30 (kg/m^2)	125,50	0,0453	22	23	9	6	17	19	12	7
Male ch > 5.0 (mmol/L)	159,00	0,2733	51	52	25	15	45	46	18	12
Male ch > 6.2 (mmol/L)	155,00	0,2287	15	14	13	8	12	12	8	5
Male glu > 7.0 (mmol/L)	157,00	0,2503	11	11	2	2	10	11	3	2
Male AD1 > 140/90 (mm Hg)	186,50	0,7251	35	34	10	8	36	37	16	9
Male AD2 > 140/90 (mm Hg)	198,00	0,9676	46	46	8	5	45	46	14	8
Male insact <60 minutes/day walking	71,00	0,1026	34	32	9	12	28	23	16	10
Beverages, Alcoholic2003-05	181,00	0,6168	16	13	10	11	19	15	17	15
Wine2003-05	104,50	0,0169	44	28	57	49	12	12	17	11
Beer2003-05	111,00	0,0167	192	182	136	115	108	84	111	78
Ba/wine	193,50	0,8711	1,9	0,5	2	4	1,8	1,0	2	3
Red m/Gl	113,00	0,0193	0	0	0	0	0	0	0	0
Fat a/Oil v	170,50	0,4328	1	0	1	1	1	0	1	1
TCL g/person/day	132,00	0,0679	1991	2095	835	535	1675	1738	985	558
AP amount	141,00	0,1136	682	655	258	223	555	557	400	241
GV amount	197,00	0,9461	801	776	279	246	800	799	488	271

FD amount	110,50	0,0161	241	208	132	104	171	166	73	72
AB amount	99,00	0,0066	251	230	190	141	138	111	135	90
AP Energy%2003-05	137,00	0,0909	26	26	13	8	22	23	13	8
AP Protein%2003-05	120,50	0,0326	55	57	16	10	47	49	15	12
AP Fat%2003-05	175,50	0,5162	53	53	19	12	51	56	18	12
Carboh%E 2003-05	106,00	0,0114	57	56	10	7	63	63	12	7
Proteins%E 2003-05	138,50	0,0989	12	12	2	1	11	11	2	1
Fats%E 2003-05	109,00	0,0144	32	33	10	6	26	26	11	7
Energy (kcal/person/day)2003-05	120,00	0,0315	3149	3270	765	478	2815	2865	595	408
mDailyAgecigarette smoking	72,00	0,1006	30	31	15	9	38	38	24	17
7 and 8 groups										
Variable	**Mann-Whitney U Test (w/ continuity correction) (Spreadsheet1_(Recovered)) By variable RANG Marked tests are significant at p <,05000**									
	U	**p-value**	**Mean**	**Median**	**Quartile**	**Std.Dev.**	**Mean 8**	**Median 8**	**Quartile 8**	**Std.Dev.8**
IPC 2000	192,00	0,8392	11933	8421	15780	11001	10098	7054	5258	8913
Gini Index 2021	168,50	0,9515	1	1	0	0	1	1	0	0
lat°	147,00	0,1556	28	27	21	15	37	45	40	21
UV rad J/m^2 2004	159,00	0,2733	3813	4267	2082	1277	3142	2084	3178	1677
Prosperity Rating	187,00	0,7353	53	53	59	34	59	61	40	32
Rating Educations	187,00	0,7353	58	64	49	32	54	47	47	34
Rating of the Social capital	187,50	0,7455	59	61	72	38	63	61	55	36
Rank of corruption 2016	169,00	0,5646	70	69	98	53	80	85	76	47
Rating of peacefulness	120,50	0,1946	60	64	56	41	79	88	66	43
HPI 2016	155,00	0,3324	6	6	2	1	6	6	1	1
Index of human development	196,50	0,9353	1	1	0	0	1	1	0	0
EEI Ecological efficiency index	177,00	0,7254	58	53	19	12	56	53	16	14
Access to the street. medicine1990	147,00	0,4929	85	90	23	15	89	93	18	12
Access to clean water1990	159,00	0,7490	73	84	46	27	78	84	34	23
Air pollution for children under 5 years old 2004	182,00	0,6359	31	11	34	60	23	3	24	45

CCR5 rs333-	65,00	0,3776	0	0	0	0	0	0	0	0
Female life expectancy	158,00	0,5296	78	78	6	5	78	78	4	4
Male life expectancy	119,50	0,0794	73	72	7	5	70	70	6	5
Gender LE 2019	86,50	0,0066	5	5	3	2	8	7	4	2
Men Death	125,00	0,0439	894	866	512	293	1137	1009	555	382
Infectious and parasitic diseases	185,00	0,6949	1654	1119	2138	1616	2200	1644	1998	2713
Noncommunicable diseases	136,00	0,0859	12112	12609	3123	2223	14007	13100	4092	3220
Malignant neoplasms	149,00	0,1719	1367	1342	375	326	1616	1691	985	526
Mouth and oropharynx cancers	155,00	0,2287	56	42	47	30	88	80	113	65
Oesophagus cancer	164,00	0,3369	53	35	44	53	56	52	38	38
Stomach cancer	111,00	0,0167	133	119	119	84	203	216	135	97
Colon and rectum cancers	168,00	0,3942	117	105	100	53	138	143	128	78
Liver cancer	181,00	0,6168	87	45	30	102	97	53	48	124
Pancreas cancer	138,00	0,0962	48	47	33	19	67	81	66	37
Trachea, bronchus, lung cancers	158,00	0,2616	253	241	170	108	339	347	388	207
Melanoma and other skin cancers	199,00	0,9892	24	20	26	19	21	24	23	15
Breast cancer	193,00	0,8604	1	0	2	1	1	0	1	2
Prostate cancer	176,00	0,5250	142	131	56	87	121	129	77	56
Bladder cancer	152,00	0,1988	35	36	29	17	44	44	38	23
Lymphomas, multiple myeloma	168,00	0,3942	89	90	28	32	78	81	40	29
Leukaemia	195,00	0,9031	88	82	39	29	86	89	38	30
Other neoplasms	144,00	0,1333	38	26	37	26	24	23	11	13
Alcohol use disorders	-	0,0000	982	968	159	85	1547	1 400	428	296
Male BMI > 25 (kg/m^2)	161,00	0,2977	53	60	20	17	52	56	19	12
Male BMI > 30(kg/m^2)	167,50	0,3867	18	20	13	9	17	19	12	7
Male ch > 5.0 (mmol/L)	155,00	0,2287	41	38	21	12	45	46	18	12
Male ch > 6.2 (mmol/L)	152,00	0,1988	10	8	8	5	12	12	8	5
Male glu > 7.0 (mmol/L)	177,50	0,5518	9	10	4	2	10	11	3	2
Male AD1 > 140/90 (mm Hg)	131,00	0,0639	30	29	9	7	36	37	16	9

Male AD2 > 140/90 (mm Hg)	137,00	0,0909	41	41	9	5	45	46	14	8
Male insact < 60 minutes/day walking	52,00	0,1008	38	36	17	16	28	23	16	10
Beverages, Alcoholic2003-05	113,50	0,0200	9	9	8	5	19	15	17	15
Wine2003-05	171,50	0,6130	22	5	38	28	12	12	17	11
Beer2003-05	191,00	0,8181	107	83	130	81	108	84	111	78
Ba/wine	193,50	0,8711	2	0	3	3	2	1	2	3
Red m/Gl	165,00	0,3507	0	0	0	0	0	0	0	0
Fat a/Oil v	196,00	0,9246	1	0	1	1	1	0	1	1
TCL g/person/day	180,00	0,5979	1590	1546	847	470	1675	1738	985	558
AP amount	192,00	0,8392	538	542	274	232	555	557	400	241
GV amount	159,50	0,2793	712	675	339	219	800	799	488	271
FD amount	185,00	0,6949	191	172	175	93	171	166	73	72
AB amount	195,50	0,9138	138	121	156	95	138	111	135	90
AP Energy%2003-05	198,00	0,9676	22	21	11	7	22	23	13	8
AP Protein%2003-05	189,50	0,7868	48	50	17	12	47	49	15	12
AP Fat%2003-05	191,50	0,8287	50	53	17	11	51	56	18	12
Carboh%E 2003-05	187,50	0,7455	62	63	12	8	63	63	12	7
Proteins%E 2003-05	180,50	0,6073	11	12	2	1	11	11	2	1
Fats%E 2003-05	178,50	0,5700	27	27	11	7	26	26	11	7
Energy (kcal/person/day)2003-05	189,00	0,7764	2836	2870	615	452	2815	2865	595	408
mDailyAgecigarette smoking	74,00	0,1190	29	28	18	14	38	38	24	17

Table 1: *Comparative analysis of the burden of alcoholism and cancer and MS in 160 countries of the world in 2004 (Mann-Whitney U test). Legend: IPC: Income; HPI: Happiness Index; Ba/wine: The Ratio of Spirits to Wine; Red m/Gl: Ratio of Red Meat to Legumes; Fat a/ Oil v: The Ratio of Animal Fat to Vegetable Oils; TCL g/person/day: Total Food Consumption; AP amount: Animal Products; GV Amount: Grains. Vegetables; FD Amount: Fruits and Sweeteners; AB Amount: 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.*

The average gradient in the burden of alcoholism across 8 groups from 160 countries is exponential. The median characteristics of the burden of alcoholism are statistically significantly different in each of the 7 groups of countries from the 8th group of countries ($p \leq 0.001$).

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

An analysis of the cancer incidence in 160 countries 2004

The median burden of "Cancer of the trachea, bronchus, lung", "Cancer of the stomach" and "Cancer of the colon and rectum" was statistically significantly 3 - 4 times higher in group 8 compared to group 1 ($p \leq 0.01$) (Table 1 and figure 2).

The median burden of "Prostate cancer", "Leukaemia" and "Pancreas cancer", "Oesophagus cancer", "Melanoma and other skin cancers" and "Breast cancer" was 1,5 times higher in group 8 compared to group 1 ($p \leq 0,02$) (Table 1).

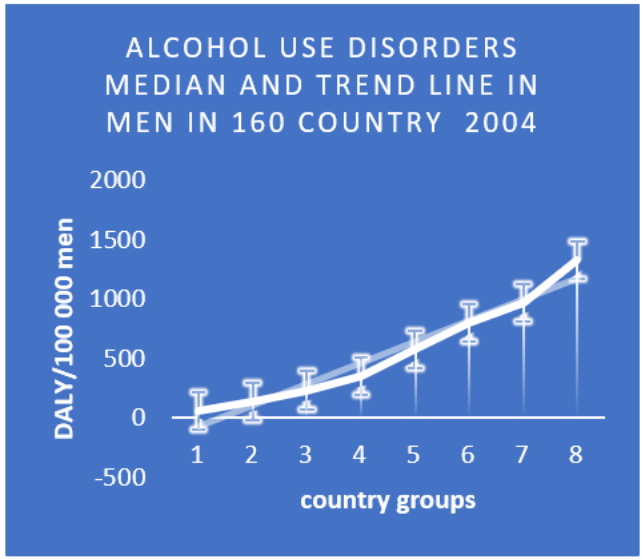

Figure 1: *Burden alcohol use disorders median and trend line in men in 160 country 2004 y.*

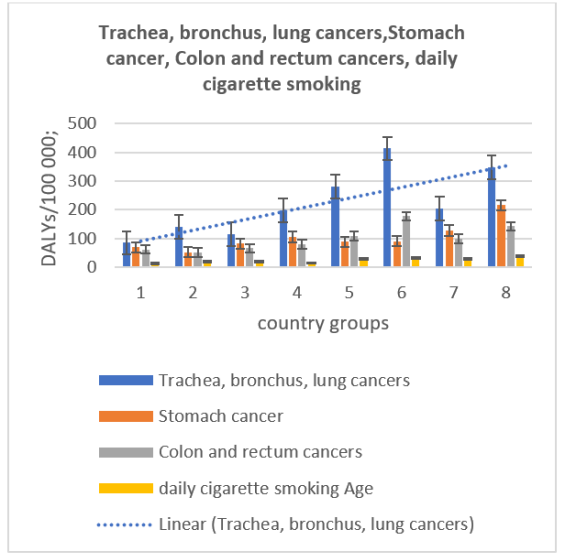

Figure 2: *Burden of cancer 1 in 160 countries in 2004 in men (DALY, Median).*

The median burden of "liver cancer", "Lymphomas, multiple myeloma", "Mouth and oropharynx cancers", "Bladder cancer" and "Other neoplasms" was statistically significantly lower in group 8 compared to groups 1 to 7 ($p = 0.01$) (Table 1 and figure 3).

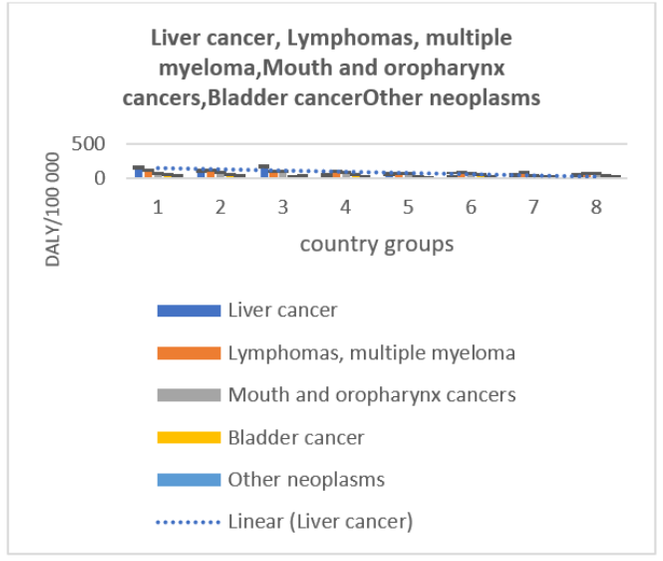

Figure 3: *Burden of cancer 4 in 160 country 2004 y (median).*

Metabolic syndrome in 160 countries 2004

All predictors of metabolic syndrome: BMI > 25 - 30; Cholesterol > 5 - 6.2; Glucose > 7; blood pressure > 140/90 and Lack of physical activity increased by 2-3 times from group 1 to group 8 (P = 0.001).

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) respectively (Table 1 and figure 4).

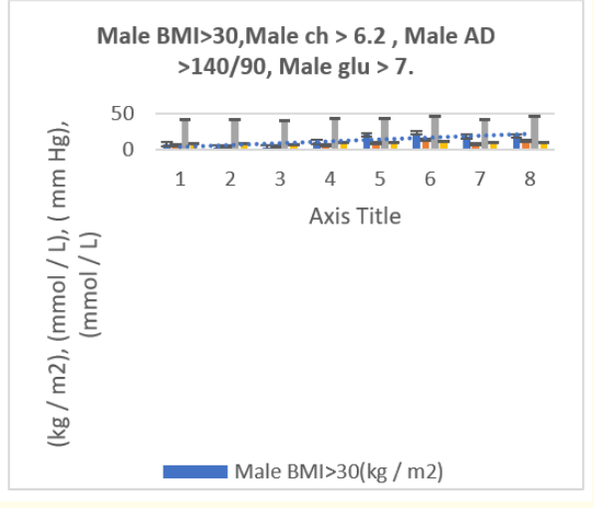

Figure 4: *Precursors of the metabolic syndrome.*

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 ($p \leq 0.02$); 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 and figure 5). The income trend line in the 8 groups was increasing.

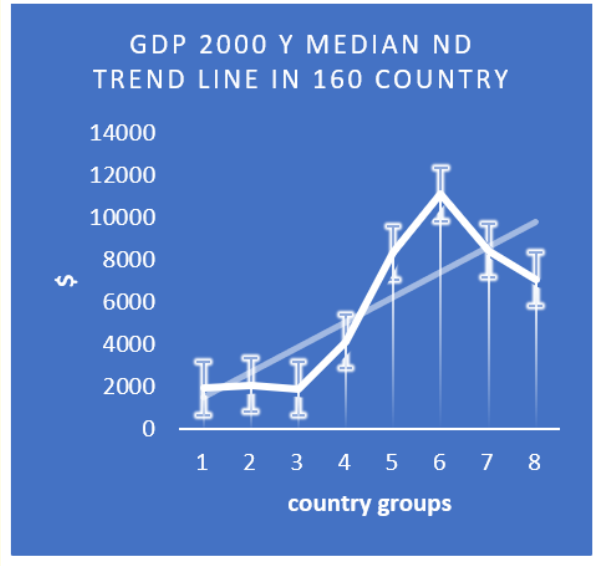

Figure 5: *Per capita income (GDP) in 160 countries in 2000 for men ($/year, Median).*

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 ($p \leq 0.002$). In the 6th and 7th group of cases, registration did not differ 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). From the 4th to the 7th groups of countries, social characteristics did not statistically significantly differ from the 8th group of countries (Table 1).

By 2019, the median life expectancy of women in group 1 was 4 years lower than in group 8 ($p = 0.022$). Median life expectancy for men in Group 1 countries was not statistically significantly different from Group 8 countries. Median 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 ($p = 0.002$). At the same time, in group 1 of countries, the gender difference was 3 years. In the 8th group of countries, the gender difference was 7 years ($p = 0.001$) (Table 1 and figure 6).

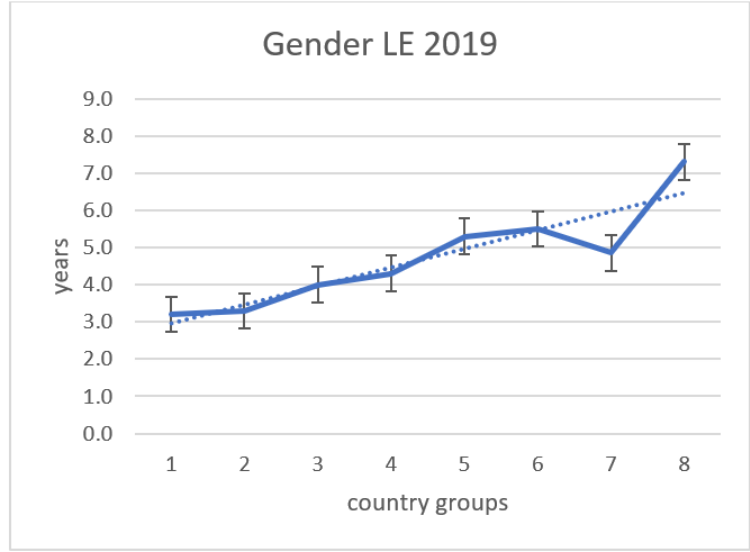

Figure 6: *Gender LE women - men 2019 y in 160 country (median).*

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. 001).

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 = 0.001) (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 7).

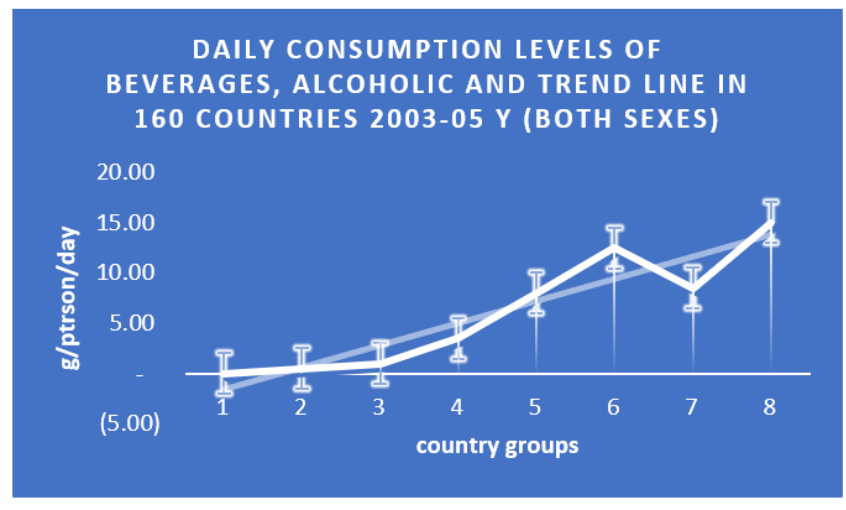

Figure 7: *Daily consumption levels of beverages, alcoholic and trend line in 160 countries 2003-05 y (both sexes).*

Wine consumption levels were statistically significantly higher in 4 groups (p = 0.001) (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 = 0.001) (Table 1). The gradient of median daily beer consumption had an increasing trend line in 8 groups of countries from 6 to 84 years.

The levels of total consumption of alcoholic beverages in 5 groups of countries differed statistically significantly from the 8th group of countries (p = 0.001). 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.

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).

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).

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.

Cigarette consumption (day) increased from group 1 to group 8 from 15 to 38 cigarettes/day. Smoking in groups 2, 3 and 4 was statistically significantly different from group 8 of countries (Table 1 and figure 2).

Discussion

The alcoholism burden gradient of 160 countries was represented by statistical characteristics of 8 groups of countries. The burden of alcoholism in each of the 7 groups was statistically significantly different from the burden of alcoholism in the 8th group of countries ($p \leq 0.001$). In Group 8, the median burden of alcoholism was 23 times that of Group 1 (1400 DALYs vs 60 DALYs).

The alcoholism gradient in the 8 country groups did not follow income growth. In groups 1, 2 and 3 the income was the same ($2000). In groups 4, 5 and 6, income doubled to $4000, $8000, and $11086. Then, in groups 7 and 8, income dropped to $7000, despite a steady increase in the alcoholism gradient. In group 1, there were 4 countries with an average income of $50000, but with minimal alcoholism (Kuwait, Saudi Arabia, Italy, United Arab. E.).

The alcoholism gradient steadily followed an increase in geographic latitude and a decrease in UV (j/m^2) from 5300 in group 1 to 2000 in groups 6.7 and 8, respectively. The alcoholism gradient was closest to the hard alcohol consumption gradient. But the trajectory of the total consumption of alcoholic beverages (strong alcohol, wine and beer) from group 1 to group 8 was close to the change in income from group 1 to group 8. This is probably why the total consumption of alcoholic beverages in the 6th group of countries was two times statistically significantly higher than in the 8th group of countries (230 versus 111 g/person/day). Although the burden of alcoholism in the 6th group of countries was statistically significantly 2 times lower, than in Group 8 (797 DALYs versus 1400 DALYs).

In Russia in the 1970s, alcoholics were isolated and forced to work as hard as they could. By the age of 80, they came to the conclusion that "alcohol abusers" suffer from a number of neuropsychiatric disorders and need medical help [36,37]. Geneticists have identified a genetic predisposition to alcohol abuse [38,39].

In recent years, alcoholism with addiction has been referred to as a reward deficit syndrome [40,41]. It has been shown that the minimum risk of death from all causes is about 100g of alcohol per week. In contrast, increased alcohol consumption is associated with a lower risk of myocardial infarction. Alcohol consumption > 100 - ≤ 200 g per week, > 200 - ≤ 350g per week or > 350g per week reduces life expectancy by 6 months, 1 - 2 years or 4 - 5 years, respectively [42].

A folk sign testifies: "teetotalers and heavy drinkers live the same way. Average drinkers live long". Indeed, in Groups 1 and 8, the median life expectancy (LE) for men is statistically the same (69 versus 70 years). In the 6th group of countries, men live 75 years and their level of strong alcohol consumption is 12.5 g/person/day versus 15 g/person/day in the 8th group of countries.

Thus, our results coincided with popular wisdom. But the truth is in the details. Namely, in the gender difference LE. The gender difference in LE of men from groups 1 and 8 differs statistically significantly by 4.1 years (3.2 years versus 7.3 years). Thus, heavy drinkers in group 8 lose an average of 4.1 years of LE. But in some countries of the 8th group, the gender losses of LE are significantly greater: Russia -11.4 years, Belarus- 11.2, Lithuania - 10.8, Ukraine -10.0 in 2019). The reasons for the gender difference are complex and not only related to alcoholism [43-46].

The burden of oncological diseases (OD) in men in the GBD 2004 database [28] is represented by 14 types of cancer. Depending on the size of the burden of OCs and the nature of distribution across 8 groups of countries, we identified 4 groups of OCs: a - Trachea, bronchus,

lung cancers, Stomach cancer and Colon and rectum cancers; b - Prostate cancer, Leukaemia and Pancreas cancer; c- Oesophagus cancer, Melanoma and other skin cancers, and Breast cancer; d - Liver cancer, Lymphomas, multiple myeloma, Mouth and oropharynx cancers, Bladder cancer and Other neoplasms. The burden of OD types a, b and c increased in parallel with the alcoholysis gradient from the 1st group of countries to the 8th group of countries. The burden of tracheal cancer, stomach and colorectal times was the highest in the 1st group of countries and increased by 3 - 4 times in the 8th group of countries [1-6].

The burden of prostate cancer, leukemia and pancreatic cancer in Group 1 countries was 1/3 lower than that of trachea, stomach and colorectal cancer. The increase in the burden of these types of cancer in the 8th group of countries was less pronounced than cancer of the trachea, stomach and colorectal cancer, on average 2 times [1-6].

The burden of Oesophagus cancer, melanoma and breast cancer in men was 3 times lower than breast cancer in group 1 countries. Following the alcoholism gradient was the lowest. By the 8th group of countries, the burden of these cancers increased to the 8th group of countries by 1.5 times [1-6].

The last group consisted of 5 types of cancer: liver cancer, lymphoma, oral cavity cancer, bladder cancer and other cancers. Cancers of these types had a high burden in Group 1 countries. But by Group 8 countries, the burden of these cancers had dropped significantly. These types of cancer are associated with viral infections [1-6,12-15].

Predictors of metabolic syndrome (overweight, obesity, hyperlipidemia, hyperglycemia, high blood pressure and physical inactivity) increased by an average of 2 times from group 1 to group 8. Thus, the proportion (%) of men with metabolic syndrome disorders has increased in countries in line with the increase in the consumption of alcoholic beverages, cigarettes, foodstuffs and products of animal origin. Rising metabolic syndrome and levels of consumption of alcohol, cigarettes, animal products, and alcoholism are well-known risk factors for OD [47,48].

Conclusion

As a result of the research, a statistically significantly increasing 26-fold gradient in the burden of alcoholism was found in 8 groups in 160 countries. The burden of 9 types of cancer in 8 groups of countries increased by 1.5 - 4 times in parallel with the increase in the alcoholism gradient, the increase in the consumption of strong alcohol, cigarettes and animal products. The burden of 5 types of cancer decreased by 3 - 4 times as the alcoholism gradient increased and was associated with viral infections. In parallel with the growth of the alcoholism gradient, the predictors of the metabolic syndrome increased by 1.5 - 2.5 times in the countries: overweight, obesity, hyperlipidemia, hyperglycemia, blood pressure and low physical activity. The life expectancy of men was not statistically significantly different at the minimum and maximum burden of alcoholism. However, the gender difference in life expectancy between men and women increased statistically significantly from 1st group of countries to 8th group of countries from 3 to 7 years. The results indicate an increase in risk factors for the burden of 9 types of cancer in parallel with the increase in the alcoholism gradient.

Conflict of Interest

The authors have no conflict of interest.

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