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Research Article

Comparative Analysis of Risk Factors for the Burden of NCDs in Men in European and Asia-Pacific countries (Observational Observations)

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Abstract

Objective: To study risk factors for the burden of NCD in European and Asia-Pacific countries in 2004.

Methods and results: Mann-Whitney U test.

36 European and 36 Asia-Pacific countries.

The research results showed that in European countries (Group 1) all Global NCD risk factors were statistically significantly (SR) higher than in Asia-Pacific countries (Group 2). Overweight, obesity, hypercholesterolemia, hyperglycemia, hypertension, high consumption of animal products, red meat, animal fats, of animal and total macronutrients and all types of alcoholic beverages was higher in group 1 countries compared to group 2 countries. But the total burden of NCDs in group 1 of CV countries did not differ from group 2.

In group 1 countries, 7 out of 13 cancers, the burden of Alzheimer's disease, Parkinson's disease, multiple sclerosis and suicide were CV in 2-3 times higher than in the 2nd group of countries. This is in line with the idea of NCD risk factors. However, in Group 1 countries, the burden of Type 2 Diabetes, Endocrine Diseases, Depression, Sensory Organ Diseases, Respiratory, Cardiovascular and Digestive Diseases was 1.5-2.5 times lower, which does not correspond to literature data.

Conclusions: Thus, European countries with high NCD risk factors are more successful than Asia-Pacific countries in coping with the burden of NCDs, probably due to high quality of life, health and environmental safety.

Keywords: Quality of Life; Metabolic Syndrome; NCD Risk Factors; Levels of Consumption of Foods; Alcoholic Beverages; Nutrients; Diet Patterns

Abbreviations

AB: Alcoholic Beverage; AP: Animal Products; BMI: Body Mass Index; BP: Blood Pressure; CD: Communicable, Maternal, Perinatal Diseases; Chol.: Blood Cholesterol; FAO: Food and Agriculture Organization of the United Nations; COPD: Chronic Obstructive Pulmonary Disease; FS: Fruits and Sweeteners; GDP: Domestic

Gross Product; Glu.: Blood Glucose; HPI: Happiness Index; IHD: Index of Human Development; LPA: Low Physical Activity; NCD: Noncommunicable Diseases; CV: Cereals and Vegetables; SS: Statistically Significant; TCL: Total Daily Consumption; UV: Ultraviolet Level

Introduction

Noncommunicable diseases (NCDs) are one of the leading causes of death worldwide. NCDs include a number of modifiable risk factors: unhealthy diet, physical inactivity, tobacco and alcohol use [1].

For cardiovascular diseases, chronic respiratory diseases, diabetes and cancer account for over 60% of all deaths in the world. The United Nations (UN) has set a goal of reducing these NCDs by 25% by 2025. CVDs account for half of the deaths in the world [2].

Cardiovascular disease (CVD) is the main cause of growing death and morbidity in the world due to the growth of risk factors: hypertension, dyslipidemia, diabetes, obesity, low physical activity, and alcohol and tobacco use [3].

NCDs are a global health problem in low- and middle-income countries. The increase in NCDs is especially noticeable in Southeast Asia [4].

Urbanization and industrialization are increasing the burden of NCDs worldwide. Physical inactivity and overweight/obesity increased with higher education [5].

The rise of NCDs in India is linked to the epidemiological transition. Urbanization is increasing the rise of traditional risk factors for cardiovascular disease and obesity. A biomarker study of the "Asian-Indian phenotype" revealed central obesity. It occurs at a lower body mass index [6].

The large-scale GWAS of lung function has revealed new loci and a common genetic etiology of lung function and obesity [7].

Obesity in children and adolescents is increasing not only among high socioeconomic groups, but also among lower income groups [8].

New strategies to combat NCDs include the four elements of health - sleep, emotions, exercise and diet [9].

More than a quarter of adults in the United Kingdom are obese. The prevalence of obesity varies by ethnicity. South Asians have the highest burden of NCDs [10].

Social economic inequality contributes to disparities in the burden of NCDs among disadvantaged and disadvantaged populations in low-, middle- and high-income countries [11].

New information shows a significant association between cardiovascular disease, diabetes, and exposure to environmental chemicals [12].

SARS-CoV-2 patients with NCDs are at higher risk of complications. It is closely related to obstructive sleep apnea syndrome. An increased prevalence of COVID-19 was found among patients with obesity and obstructive sleep apnea [13].

Obesity has become epidemic and is a major risk factor for NCDs, including diabetes, heart disease, vascular disease and cancer. However, the molecular mechanisms of nutrition-mediated oxidative stress are complex and poorly understood. There are different types of nutrition-mediated sources of oxidative stress that cause inflammation.

High macronutrient intake promotes oxidative stress and inflammation through nuclear factor kappa B- (NF-κB-) mediated signaling pathways. Dietary carbohydrates of animal origin may contribute to the long-term effects of inflammation [14].

Pacific island countries are affected by NCDs. Trade is the driving force behind NCDs in the Pacific. Spending on imported food was significant in all countries. The authors found associations in expenditure and calorie intake between "unhealthy" and imported foods [15].

The most common NCDs are cardiovascular disease, diabetes, cancer and chronic respiratory diseases. In Asia and the Pacific, NCDs are the leading cause of death and disease burden in the region. People from a low socioeconomic group are more affected by NCDs. The three main NCDs in Asia and the Pacific are cardiovascular disease, cancer and diabetes. The main risk factors are the use of tobacco, alcohol, low physical activity and unhealthy diet [16,17].

Inflammation is a reversible mechanism of obesity. Obesity increases the risk of cancer and its progression. [18].

Obesity and type 2 diabetes are associated with morbidity and mortality from many types of cancer. Metabolic disorders associated with type 2 diabetes develop many years before the onset of diabetes and contribute to cancer risk [19].

Purpose of the Study

To study the risk factors for NCDs in European and Asia-Pacific countries.

Materials and Methods

Study design: statistical analysis of observations.

For the purposes of this work, an NCD burden database was formed (ICD-10 codes) for 36 European countries - 1st group of countries, and for 36 countries of the Asia-Pacific region - 2nd group of countries (List of countries Table 1).

	Male age st 2004	IPC 2000	IPC 2016	lat°	lon°	UV rad J/m2 2004
1 group	Countries of Europe					
1	Albania	4 027	11 929	41,2	20,1	2542
2	Austria	29 301	50 078	47,1	16,34	1888
3	Belarus	5 995	18 061	53,5	26	1795
4	Belgium	27 967	46 383	50,8	4,47	1645
5	Bosnia and Herzegovina	4 526	12 075	43,5	17,56	2205
6	Bulgaria	6 371	19 199	42,4	27,55	2331
7	Croatia	10 747	23 596	45,3	16,18	1976
8	Czech Republic	16 132	34 711	50,1	14,25	1707
9	Denmark	28 640	49 696	55,7	9,43	1691
10	Estonia	9 414	29 365	59,2	24,5	1781
11	Finland	26 732	43 053	60,8	24,56	1494
12	France	26 193	41 466	48,5	2,35	1907
13	Germany	27 277	48 730	53,4	12,25	1812
14	Greece	19 504	26 783	37,9	23,44	2753
15	United Kingdom	26 031	42 609	51,3	0	1576
16	Iceland	29 498	51 399	65,2	19,6	957
17	Ireland	30 155	68 883	51,8	6,15	1509
18	Italy	27 006	38 161	45,3	11,38	2444
19	Latvia	8 013	26 031	56,5	24,3	1671
20	Lithuania	8 451	29 966	54,4	25,6	1801
21	Luxembourg	55 306	105 882	49,6	6,13	1687
22	Malta	19 411	37 899	35,9	14,48	3091
23	R Moldova	1 840	5 334	46,8	27,15	1910
24	Norway	36 928	59 302	59,6	10,45	1439
25	The Netherlands	31 573	50 898	52,2	4,27	1662
26	Poland	10 645	27 811	52,3	15,38	1749

27	Portugal	18 872	30 624	39,2	30,3	2585
28	Romania	5 873	23 626	43,5	26,06	2071
29	Serbia and M	5 722	14 512	44,5	20,65	2257
30	Slovakia	11 348	30 632	48,4	19,3	1795
31	Slovenia	18 036	32 885	46,1	14,46	2256
32	Spain	21 517	36 310	40,4	15,23	2705
33	Sweden	29 258	49 175	59,2	16,1	1587
34	Switzerland	35 675	62 881	46,7	6,08	2158
35	Ukraine	3 803	8 272	50,2	36,8	1843
36	Russian F	6 825	23 163	55,5	37,37	1795
	Male age st 2004	IPC 2000	IPC 2016	lat°	lon°	UV rad J/m2 2004
2 group	countries of the Asia-Pacific region					
1	Australia	26406	46790	34	151,11	3206
2	Canada	29185	44025	49,1	27,55	1887
3	Japan	26795	41470	35,3	84,48	2521
4	El Salvador	5044	8619	13,2	89,1	5364
5	Thailand	7284	16916	15,9	100,29	4862
6	Panama	8379	23015	8,9	13,41	4898
7	Costa Rica	7830	16614	9,6	84,21	4884
8	Peru	5202	13022	12,1	77,11	5906
9	Korea R	18083	35751	37,3	129,2	2535
10	Chile	9608	23960	33,3	70,79	3982
11	New Zealand	21510	39059	36,5	168,74	2487
12	Guatemala	4812	7947	14,6	90,22	5141
13	Mexico	10429	17862	19,3	119	4974
14	Brunei	65035	77441	4,6	114,56	5148
15	United States of America	36450	57467	38,5	83	2736
16	Ecuador	5856	11286	1,9	89,36	4929
17	Colombia	6585	14158	4,6	74,8	5385
18	China	2933	15535	31,5	116,23	2908
19	Nicaragua	2739	5541	12,1	86,18	5078
20	Viet Nam	2100	6424	21,1	105,53	4293
21	Malaysia	12928	27681	5,3	100,19	5225
22	Honduras	2638	4738	14,3	86,85	4924
23	Sri Lanka	4423	12316	6,6	79,88	5264
24	Indonesia	4602	11612	6,3	106,45	5220
25	Korea DR	3497	7236	39,2	125,45	2335
26	Bangladesh	1301	3581	22,8	88,6	4029
27	India	1978	6572	28,4	77,13	4514

28	Philippines	3348	7806	14,4	121	4928
29	Solomon Islands	1371	2236	9,3	160,03	4071
30	Nepal	1220	2468	27,4	84	4130
31	Vanuatu	2238	3081	15,3	167,54	4555
32	Myanmar	1036	5773	16,5	94,55	4565
33	Cambodia	1091	3735	11,3	102,58	5152
34	Samoa	3429	6345	13,5	170,7	4966
35	Mongolia	3690	12220	47,9	106,52	2226
36	Fiji	5290	9561	18,1	89,3	4431

Table 1: List of European and Asian Pacific countries..

Burden of disease (DALY) data for men in 72 countries, standardized by sex and age were selected from the 2004 GBD database [20].

To characterize the "quality of life" (QOL) in countries, a number of indicators were used: Per capita income or gross domestic product (GDP) in 2000 - 2016 (US dollars per person per year) [21]. Geographical position of countries by latitude, longitude and level of Ultraviolet radiation in the capital (UV) (J/m^2 2004) [22]. Life expectancy for men and women (LE) [23].

Access to quality medicine, clean water and clean air [24]. Happiness index (IH) in 2016 [25]. Predictors of the Metabolic Syndrome (MSP) - percentage of men in the country who are overweight and obese. Body mass index (BMI) ≥ 25 kg/m^2 and ≥ 30 kg/m^2 Blood cholesterol level (Chol. ≥ 5.0 mmol/l and ≥ 6.2 mmol/l). Blood glucose level (Glu. ≥ 7.0 mmol/l). Blood pressure (BP ≥ 140/90 mmHg). Low physical activity (LPA) ≤ 60 min/day of walking [26].

Daily Food Consumption Level (Total CL) (g/person/len). 50 types of products for each country were selected from the FAO database for 1992-2005 [27].

The structure of nutrition (DP) of countries is presented in the form of 4 blocks in absolute and percentage terms (Total CL): 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 results of the study was carried out using the Mann-Whitney-Wilcoxon U-test. U is the numerical value of the Mann-Whitney test.

The central trend in the distribution of data in the sample was represented by the median with quartile range and mean with standard deviation. The variance of the data in the samples was estimated using a quartile range (QR) between the first and third quartiles (between the 25th and 75th percentiles).

The level of statistical significance, reflecting the degree of confidence in the conclusion about the differences in indicators of groups 1 and 2 of countries: two levels of accuracy were evaluated: (1) $p \leq 0.01$ - 1% error probability; (2) $p \leq 0.05$ - 5% error probability. To assess the significance of the results of the study, the Bonferroni correction was also used, taking into account two hypotheses $p \leq 0.025$ in multiple comparisons.

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

Research results

The quality of life

The economic and geographical characteristics of the Euro countries (Group 1) are statistically significantly (SZ) different from the Asia-Pacific countries (Group 2) (Table 2). Median Income of group 1 in 2000 is 4 times higher than group 2. The median of the geographical latitude of group 1 is 34° north.

The median UV radiation in group 2 is 3 times higher than in group 1. Group 1 is 80° closer to Greenwich Mean Time than Group 2 (Table 2, Figure 1).

Variable	Z	p-value	Mean 1	Median 1	Quartile 1	Standard 1	Mean 2	Median 2	Quartile 2	Standard 2
IPC 2000	3,97	0,0001	19017	19142	20884	2053	9898	4928	7330	2174
IPC 2016	4,33	0,0000	36427	33798	25341	3266	18052	11916	17103	2920
lat°	6,86	0,0000	50	50	9	1	20	16	22	2
lon°	- 6,97	0,0000	17	16	14	2	101	92	34	6
UV rad J/m2 2004	- 6,74	0,0000	1947	1807	552	72	4268	4714	1516	185
Prosperity Rang	- 3,67	0,0002	34	27	37	4	61	69	38	5
Rang Educations	- 4,80	0,0000	30	30	29	3	66	72	34	5
Rang of the Social capital	- 1,97	0,0486	46	39	52	6	63	72	54	6
Rang of corruption 2016	- 3,40	0,0007	46	38	56	7	85	85	69	8
Rang of peacefulness	- 3,17	0,0015	37	27	40	6	74	82	84	9
HPI 2006	- 5,09	0,0000	39	39	9	1	52	54	18	2
HPI 2016	1,38	0,1682	6,177	6,028	1,439	0,158	5,816	5,949	1,794	0,184
Gini Index 2021	- 1,54	0,1241	0,711	0,693	0,117	0,015	0,729	0,743	0,092	0,013
Index of human development	4,40	0,0000	0,902	0,919	0,104	0,011	0,776	0,771	0,150	0,021
EEI Ecological efficiency index	4,78	0,0000	69	74	16	2	52	51	18	2
Access to the street. medicine1990	5,31	0,0000	98	100	2	1	79	81	21	3
Access to clean water1990	4,82	0,0000	96	100	4	1	60	59	48	5
Air pollution for children under 5 years old 2004	- 4,77	0,0000	4	0	1	2	34	18	54	7
% NAT2	- 3,56	0,0004	42	44	10	1	65	62	35	4
LE female life expectancy	4,33	0,0000	80	81	4	0	75	75	7	1
LE male life expectancy	2,84	0,0045	73	75	6	1	70	69	6	1
Gender difference LE 2000	3,96	0,0001	7,1	6,7	2	0	4,9	5,2	2	0
female life expectancy	4,10	0,0000	82	83	4	0	77	77	7	1
male life expectancy	3,01	0,0026	75	78	7	1	71	72	6	1
Gender difference LE 2019	1,55	0,1201	6,2	5,7	3	0	5,2	5,0	2	0

Table 2: Quality of life in countries of groups 1 and 2 U - Mann-Whitney.

Figure 1: IPC 2ooo and 2016; UV rad j/m2 (percentage of error bars).

Median Prosperity Ranks: Education, Social Capital, Corruption, Peacefulness in the 1st group of countries SZ is higher than the 2nd group of countries. However, the Median Happiness Index in group 1 of countries is lower than group 2 (Table 2 Figure 2).

Figure 2: Prosperity Rang 1 and 2 groups of countries (percentage of error bars).

The medians of the Human Development Index, Environmental Efficiency, Level of Health Care, access to clean water and clean air in the 1st group of countries in the NW are 1.5 times higher than in the 2nd group of countries. Median life expectancy (LE) for women and men in country group 1 was avg. 6 years higher than country group 2 (Table 2, Figure 3).

Figure 3: EEI Ecological efficiency index, Access to the street. Medicine1990 Access to clean water1990, Air pollution for children under 5 years old 2004 (percentage of error bars).

However, the Median Gender Difference in Group 1 was 1.5 years SZ higher than in Group 2.

Diet patterns

The median Daily Food Consumption (Total CL) in country group 1 was 1.9 times higher than in country group 2 (2185 versus 1163 g/person/day) (Table 3).

Median consumption of Animal Products (AP) (g/person/day) was higher in Country Group 1 than in Group 2: Bovine Meat, Pig meat, Red meat, Milk, Whole, Milk, Skimmed, Eggs, Cheese, Butter, Ghee, Fats, Animals, Demersal Fish (Table 3. Figure 4, 5).

Median consumption of Grains and Vegetables (GV) (g/person/day) was higher in Country Group 1 than in Group 2: Wheat, Barley, Rye, Nuts, Potatoes, Tomatoes, Onions, Vegetables, Other, Sunflowerseed Oil, Olive Oil.

However, the median consumption of Rice and Beans was CV lower in Group 1 than in Group 2 (Table 3).

Variable	Z	p-value	Mean 1	Median 1	Quar-tile 1	Stan-dard 1	Mean 2	Median 2	Quartile 2	Stan-dard 2
Total CL (g/person/day)	6,47	0,0000	2210	2185	254	45	1274	1163	667	75
Animal products AP										
Bovine Meat 2003-05	3,52	0,0004	45	49	31	4	30	19	32	5
Pigmeat 2003-05	5,90	0,0000	94	94	50	7	29	20	45	5
Mutton & Goat Meat 2003-05	1,88	0,0608	8	3	7	2	10	2	4	4
Red meat	4,94	0,0000	147	152	67	9	69	55	73	9
Poultry Meat 2003-05	1,55	0,1215	51	49	24	3	46	40	62	6
Meat, Other 2003-05	5,00	0,0000	45	46	10	1	28	24	22	2
Offals, Edible 2003-05	2,65	0,0080	10	9	10	1	8	5	5	1
Milk, Whole 2003-05	4,49	0,0000	283	272	158	26	126	92	176	18
Milk, Skimmed 2003-05	4,97	0,0000	82	54	113	12	21	10	24	5
Eggs 2003-05	4,03	0,0001	30	31	11	1	19	15	20	2
Cheese 2003-05	6,26	0,0000	33	29	34	3	6	2	7	2
Butter, Ghee 2003-05	4,10	0,0000	8	7	9	1	3	1	3	1
Fats, Animals,2003-05	4,38	0,0000	13	12	11	1	5	4	6	1
Freshwater Fish 2003-05	0,52	0,6005	7	5	6	1	9	4	11	2
Demersal Fish 2003-05	3,14	0,0017	19	12	19	4	8	4	11	2
Pelagic Fish 2003-05	0,62	0,5356	21	13	15	4	22	12	35	4
Marine Fish, Other 2003-05	0,26	0,7956	4	3	4	1	9	2	7	2
Molluscs, Other 2003-05	0,63	0,5270	5	2	10	1	5	2	6	1
Fish amount	- 0,05	0,9596	56	44	44	8	53	52	56	6
AP amount	5,97	0,0000	757	765	208	27	383	363	299	35
% AP	2,30	0,0213	34	34	7	1	29	29	19	2
Cereals and vegetables GV										
Wheat 2003-05	6,02	0,0000	273	273	98	12	124	103	91	13
Rice 2 003-05	- 7,04	0,0000	12	12	6	1	170	161	187	22
Maize 2003-05	- 2,57	0,0103	38	14	36	11	70	40	70	15
Barley 2003-05	2,70	0,0070	8	4	8	2	2	1	3	1
Beans 2003-05	- 2,08	0,0377	4	2	4	1	9	5	7	2
Rye 2003-05	5,47	0,0000	20	11	30	4	1	0	1	0
Nuts 2003-05	4,68	0,0000	10	7	8	1	4	3	4	1
Grains and legumes	- 0,74	0,4573	362	340	111	13	372	378	105	13
Potatoes 2003-05	6,06	0,0000	225	207	119	15	72	47	83	11
Tomatoes 2003-05	4,01	0,0001	71	53	39	10	31	23	46	5
Onions 2003-05	2,70	0,0070	26	24	22	2	17	13	18	2

Vegetables, Other 2003-05	3,88	0,0001	225	197	83	14	149	108	130	23
Soyabean Oi l2003-05	- 0,09	0,9282	8	7	8	1	10	8	11	2
Sunflowerseed Oi l 2003-05	5,88	0,0000	12	9	15	2	1	0	2	0
Olive Oil 2003-05	2,90	0,0038	4	2	3	1	1	0	1	0
Oil amount	4,35	0,0000	24	20	15	2	12	9	12	2
% Oil	1,82	0,0681	1	1	1	0	1	1	1	0
GV amount	5,00	0,0000	927	867	297	35	647	593	270	36
% GV	- 3,02	0,0025	42	41	14	2	54	49	24	3
Fruits and sweeteners FS										
Oranges 2003-05	2,73	0,0063	67	42	80	10	34	26	31	6
Lemons, Limes 2003-05	2,36	0,0185	6	5	2	1	6	3	6	1
Apples 2003-05	5,78	0,0000	64	58	37	5	18	9	20	4
Honey 2003-05	4,61	0,0000	2	1	1	0	1	0	1	0
Sugar (Raw Equivalent) 2003-05	2,97	0,0030	96	103	35	5	68	67	61	7
Coffee 2003-05	4,95	0,0000	14	13	10	2	5	4	8	1
Tea 2003-05	- 1,11	0,2673	2	1	2	0	3	3	2	0
FS amount	5,02	0,0000	251	252	118	14	130	115	106	14
% FS	1,54	0,1228	11	11	5	1	10	10	7	1
Alcoholic drinks AB										
Beverages, Alcoholic 2003-05	4,22	0,0000	17	14	15	2	7	5	9	1
Wine 2003-05	6,34	0,0000	54	40	60	7	6	1	3	2
Beer2003-05	5,57	0,0000	191	174	116	16	61	37	71	12
AB amount	6,12	0,0000	263	250	138	18	74	51	100	13
% AB	5,43	0,0000	12	11	6	1	5	4	6	1
In terms of pure alcohol (liter/person/year)										
both sexes' 2016	6,24	0,0000	11	11	3	0	5	5	5	1
men	6,27	0,0000	17	18	5	1	9	8	8	1
women	6,13	0,0000	5	5	2	0	2	2	2	0
Coefficient										
Ba/wine	1,86	0,0631	0,828	0,252	1	0	1,476	0,042	2	0
Ba/beer	- 1,58	0,1136	0,146	0,070	0	0	0,362	0,168	0	0
Ba/Ab	- 2,02	0,0432	0,082	0,048	0	0	0,177	0,134	0	0
Red m/Gl	4,48	0,0000	0,438	0,416	0	0	0,215	0,150	0	0
Fat a/ Oil v	1,18	0,2370	0,712	0,523	1	0	0,817	0,310	1	0
Tobacco smoking										
mDailyAge	0,86	0,3895	35	34	13	2	32	31	21	3

fDailyAge	4,82	0,0000	21	21	9	1	8	4	10	2
Percentage Composition of Dietary Patterns										
% AP	2,30	0,0213	34	34	7	1	29	29	19	2
% GV	- 3,02	0,0025	42	41	14	2	54	49	24	3
% FS	1,54	0,1228	11	11	5	1	10	10	7	1
% AB	5,43	0,0000	12	11	6	1	5	4	6	1
% Oil	1,82	0,0681	1	0,95	1	0	1	0,73	1	0
% Fish	- 2,40	0,0164	3	2,0	2	0	5	3,1	6	1
Macronutrients										
Total Energy										
Energy (kcal/person/day) 1990-92	5,53	0,0000	3270	3310	260	55	2471	2335	615	69
Energy (kcal/person/day) 2003-05	5,49	0,0000	3282	3335	465	51	2676	2560	615	67
Proteins (g/person/day) 1990-02	5,43	0,0000	101	100	12	2	65	61	22	3
Proteins (g/person/day) 2003-05	5,54	0,0000	100	103	22	2	72	67	28	3
Fats (g/person/day) 1990-02	5,29	0,0000	129	134	24	5	66	58	38	5
Fats (g/person/day) 2003-05	5,41	0,0000	122	125	40	5	74	67	42	5
Percentage Total Energy										
Carboh%E 1990-92	- 4,28	0,0000	56	56	9	1	66	69	13	2
Carboh%E 2003-05	- 4,89	0,0000	55	53	9	1	65	66	13	1
Proteins%E 1990-92	4,87	0,0000	12	12	1	0	11	10	2	0
Proteins%E 2003-05	4,19	0,0000	12	12	2	0	11	11	2	0
Fats%E 1990-92	4,07	0,0000	32	32	9	1	23	21	15	1
Fats%E 2003-05	4,69	0,0000	33	35	9	1	24	24	11	1
Animal Food Macronutrients: Percentage of Total Energy										
AP Energy%1990-92	5,22	0,0000	30	32	9	1	16	14	12	2
AP Energy%2003-05	5,54	0,0000	29	29	8	1	16	15	12	1
AP Protein%1990-92	4,02	0,0001	55	55	13	2	38	41	31	3
AP Protein%2003-05	4,52	0,0000	56	58	12	1	41	42	24	2
AP Fat%1990-92	5,52	0,0000	63	61	16	2	42	42	19	3
AP Fat%2003-05	4,89	0,0000	57	58	8	1	41	43	17	2
Diversification of macronutrients										
E% 2003-05	4,72	0,0000	65	67	13	1	49	51	18	2
P% 2003-05	3,60	0,0003	67	69	12	1	56	58	18	2
F% 2003-05	3,57	0,0004	96	96	3	0	91	94	10	1

Table 3: Dietary Patterns and Macronutrients U - Mann-Whitney.

Figure 4: Consumption levels of animal products by country groups 1 and 2 (percentage of error bars).

Figure 5: Levels of consumption of alcoholic beverages by groups 1 and 2 of countries (percentage of error bars).

Median consumption of Fruits and Sweeteners (FS) (g/person/day) was higher in Country Group 1 than in Group 2: Oranges, Lemons, Limes, Apples, Honey, Sugar, Coffee (Table 3).

Median consumption of Alcoholic beverages (AB) (g/person/day) was higher in group 1 countries than in group 2: Beverages, Alcoholic, Wine, Beer, pure alcohol (Table 3. Figure 6).

Figure 6: Dietary Patterns (%): AP - animal products; GV- grains and vegetables; FS - fruits and sweeteners; AB-alcoholic drinks; Oil-separating oils; Fish- fish) (percentage of error bars).

Percentage composition of dietary patterns

The median consumption of Animal Products (AP) in group 1 was higher than in group 2 (34% vs. 29%) (Table 3. Figure 6).

The median intake of Grains and Vegetables (GV) in group 1 was lower than in group 2 (41% vs. 49%). The median consumption of Fruits and sweeteners (FS) was not statistically significantly higher in group 1 compared to group 2 (11% vs. 10%) (Table 3. Figure 6). Median Alcoholic Beverages (AB) consumption was 2.5 times higher in Group 1 countries than in the 2nd group of countries (11% versus 4%). The median consumption of Vegetable Oils (Oil) was higher in GHA in Group 1 than in Group 2 (0.95% vs. 0.73%). The median consumption of Fish (Fish) in group 1 was 1.5 times lower than in group 2 (2% vs. 3.1%) (Table 3. Figure 6).

Macronutrients

The median Total Energy (kcal/person/day) of country group 1 was 1.3 times the SZ of country group 2 in 1990-92 (3310 vs. 2335) and 2003-05 (3335 vs. 2560), respectively (Table 3).

Median Total Proteins (g/person/day) of country group 1 were 1.5 times the SZ of country group 2 in 1990-92 (100 vs. 61) and 2003-05 (103 vs. 67), respectively (Table 3).

The median Total Fats (g/person/day) of country group 1 were 2.3 and 1.9 times the SD of country group 2 in 1990-92 (134 vs. 58) and 2003-05 (125 vs. 67), respectively (Table 3).

Thus, over 10 years in the countries of the 1st and 2nd groups, there was an increase in the consumption of Total Energy by 0, 8% and Protein by 3% and reduced Fat intake by 7%.

Macronutrient diversification in 2003-05 in Group 1 countries was 10% higher than in Group 2 (Table 3).

Comparative analysis of metabolic syndrome predictors (Percentage of male population)

The median overweight and obesity BMI ≥ 25 and BMI ≥ 30 (kg/m^2) in country group 1 were 1.5 and 2.2 times higher than in country group 2, respectively (Table 4. Figure 7).

Variable	Z	p-value	Mean 1	Median 1	Quartile 1	Standard 1	Mean 2	Median 2	Quartile 2	Standard 2
BMI ≥ 25 (kg/m^2)	4,00	0,0001	62	63	7	1	42	43	37	4
BMI ≥ 30 (kg/m^2)	4,02	0,0001	23	23	5	1	13	11	17	2
Chol. ≥ 5.0 (mmol/L)	5,70	0,0000	57	58	14	2	38	37	21	2
Chol. ≥ 6.2 (mmol/L)	5,94	0,0000	18	18	8	1	9	7	8	1
Glu. ≥ 7.0 (mmol/L)	2,91	0,0036	11	11	2	0	9	9	4	1
BP1 ≥ 140/90 (mm Hg)	5,88	0,0000	38	38	12	1	27	26	7	1
BP2* ≥ 140/90 (mm Hg)	6,93	0,0000	49	50	6	1	38	37	5	1
LPA ≤ 60 (minutes/ day walking)	1,89	0,0585	36	31	24	3	27	31	23	3

Table 4: Metabolic Syndrome Predictors (Percentage of male population) U - Mann-Whitney.

Figure 7: Metabolic Syndrome Predictors (percentage of error bars).

Median hyperaltpidemia Chol. ≥ 5.0 and Chol. ≥ 6.

2 (mmol/L) in the 1st group of countries were CV 1.6 and 2.6 times higher than in the 2nd group of countries, respectively (Table 4. Figure 7).

Median Glu hyperglycemia. ≥ 7.0 (mmol/L) in the 1st group of countries was 1.2 times higher than in the 2nd group of countries, respectively (Table 4. Figure 7).

Median elevated blood pressures without correction BP1 ≥ 140/90 and with correction BP2* ≥ 140/90 (mm Hg) were 1.5 and 1.4 times higher CV in country group 1 than in country group 2, respectively (Table 4. Figure 7).

The median low physical activity LPA ≤ 60 (minutes/day walking) in group 1 of the NW countries did not differ from group 2 of countries (Table 4).

Thus, the proportion of men with impaired predictors of the Metabolic Syndrome was 1.5.2.5 times higher in the 1st group of countries than in the 2nd group of countries (Table 4. Figure 7).

An analysis of the burden of NCDs in the European and Asia-Pacific ocean countries

Malignant neoplasms

The median burden of 7 out of 14 cancers in country group 1 was 2-3 times higher than in country group 2: Colon and rectum cancers, Pancreas cancer, Trachea, bronchus, lung cancers, Melanoma and other skin cancers, Breast cancer, Prostate cancer, Bladder cancer (Table 5. Figure 8).

Variable	Z	p-value	Mean 1	Median 1	Quartile 1	Standard 1	Mean 2	Median 2	Quartile 2	Standard 2
Noncommunicable diseases	- 2,03	0,0421	11483	10243	4222	523	12590	12568	2854	419
Malignant neoplasms	5,47	0,0000	1776	1809	579	57	1255	1195	410	78
Mouth and oropharynx cancers	1,29	0,1972	92	94	74	9	88	43	87	13
Oesophagus cancer	1,94	0,0520	56	60	36	4	63	37	48	12
Stomach cancer	0,11	0,9148	134	102	104	13	150	120	169	20
Colon and rectum cancers	6,17	0,0000	200	194	45	9	91	68	88	9
Liver cancer	- 0,99	0,3244	61	59	36	5	151	57	133	42
Pancreas cancer	6,65	0,0000	82	83	25	3	33	29	23	3
Trachea, bronchus, lung cancers	6,08	0,0000	461	494	212	21	211	188	192	19
Melanoma and other skin cancers	5,84	0,0000	35	37	16	2	14	7	11	3
Breast cancer	6,13	0,0000	2	2	2	0	0	0	0	0
Prostate cancer	2,73	0,0063	114	118	50	6	80	62	101	10
Bladder cancer	6,82	0,0000	59	58	16	3	25	23	19	2
Lymphomas, multiple myeloma	- 1,13	0,2577	78	77	24	3	86	83	38	5
Leukaemia	- 1,36	0,1747	78	77	25	3	87	85	42	5
Other neoplasms	0,48	0,6322	28	23	14	4	23	22	11	2
Diabetes mellitus	- 5,57	0,0000	228	222	78	10	434	373	209	29
Endocrine disorders	- 2,39	0,0167	126	105	78	16	201	144	201	26
Neuropsychiatric conditions	0,72	0,4745	3192	3083	636	83	3136	2956	908	108
Unipolar depressive disorders	- 2,65	0,0080	661	678	234	21	747	752	77	20
Bipolar disorder	- 3,22	0,0013	191	188	9	1	201	200	12	2

Schizophrenia	- 6,10	0,0000	203	193	17	3	261	251	41	6
Epilepsy	- 3,95	0,0001	82	78	20	5	127	127	70	8
Alcohol use disorders	1,35	0,1784	932	813	573	84	730	719	558	71
Alzheimer and other dementias	2,35	0,0189	194	202	64	7	169	166	26	5
Parkinson disease	4,34	0,0000	47	49	23	3	29	19	18	4
Multiple sclerosis	6,54	0,0000	30	31	4	1	19	18	2	1
Drug use disorders	1,18	0,2392	216	198	210	22	217	129	232	37
Post-traumatic stress disorder	- 3,13	0,0018	29	28	2	0	30	30	0	0
Obsessive-compulsive disorder	2,83	0,0046	79	62	43	4	65	42	74	6
Panic disorder	- 4,15	0,0000	66	64	6	0	69	70	4	0
Insomnia (primary)	3,18	0,0015	62	70	18	2	51	69	34	3
Migraine	4,53	0,0000	99	117	45	4	71	68	19	3
Sense organ diseases	- 5,92	0,0000	775	731	60	11	1362	1175	907	85
Glaucoma	- 2,54	0,0111	36	23	23	3	66	58	35	7
Cataracts	- 6,50	0,0000	34	7	64	6	283	239	253	32
Refractive errors	- 6,08	0,0000	251	261	18	2	373	292	174	33
Hearing loss, adult onset	- 4,74	0,0000	359	352	0	6	497	396	313	29
Macular degeneration and other (j)	- 5,97	0,0000	94	88	10	2	143	132	56	7
Cardiovascular diseases	0,47	0,6402	3118	2117	2886	330	2749	2210	2391	237
Rheumatic heart disease	- 3,23	0,0013	17	10	23	3	51	26	75	9
Hypertensive heart disease	- 4,05	0,0001	82	46	49	15	262	161	317	38
Ischaemic heart disease	1,03	0,3028	1576	1099	1157	191	1224	1084	1094	113
Cerebrovascular disease	- 0,34	0,7312	757	565	904	86	750	730	457	72
Inflammatory heart diseases (k)	3,00	0,0027	199	85	126	40	72	62	51	8
Respiratory diseases	- 5,65	0,0000	615	584	247	27	1016	997	411	48
Chronic obstructive pulmonary disease	- 3,02	0,0025	289	298	166	19	474	472	426	43
Asthma	- 4,68	0,0000	186	184	73	10	296	294	147	17

Digestive diseases	- 2,25	0,0247	675	576	491	65	931	845	786	84
Peptic ulcer disease	- 2,28	0,0226	45	33	39	6	100	69	126	16
Cirrhosis of the liver	- 0,23	0,8174	331	291	280	45	353	287	320	45
Appendicitis	- 3,73	0,0002	5	4	2	0	10	7	8	1
Genitourinary diseases	- 6,15	0,0000	122	110	65	7	408	410	232	35
Nephritis and nephrosis	- 5,38	0,0000	54	43	52	6	245	223	235	32
Benign prostatic hypertrophy	- 5,68	0,0000	48	44	12	1	103	107	27	5
Skin diseases	- 4,70	0,0000	25	14	14	4	73	67	42	7
Musculoskeletal diseases	- 3,16	0,0016	416	345	173	16	538	446	192	35
Rheumatoid arthritis	1,51	0,1298	54	46	25	2	46	51	12	2
Osteoarthritis	- 1,90	0,0577	239	177	135	14	242	209	141	12
Congenital anomalies	- 1,17	0,2438	296	245	119	23	307	273	133	19
Oral conditions	- 5,36	0,0000	92	82	28	2	157	167	106	9
Dental caries	- 4,50	0,0000	63	58	15	1	97	90	69	6
Periodontal disease	- 4,25	0,0000	4	4	1	0	5	5	1	0
Edentulism	- 5,69	0,0000	24	19	10	1	54	65	39	4
Injuries	- 2,34	0,0194	2592	1771	1565	334	3235	2679	1937	335
Unintentional injuries	- 1,72	0,0859	1889	1412	1306	240	2027	1747	896	197
Road traffic accidents	- 2,65	0,0080	536	481	320	42	704	653	374	54
Poisonings	2,35	0,0189	235	86	190	60	61	39	69	8
Falls	1,84	0,0656	301	223	243	27	226	209	119	19
Fires	- 1,20	0,2304	74	25	63	16	59	40	45	9
Intentional injuries	- 2,18	0,0293	703	531	335	99	1208	789	1010	239
Self-inflicted injuries	3,13	0,0018	501	414	261	54	303	296	218	31

Table 5: Burden of NCDs in Country Groups 1 and 2 U - Mann-Whitney.

Figure 8: Burden of cancer in Groups 1 and 2 countries (percentage of error bars).

The median burden of Diabetes mellitus and Endocrine disorders was 1.7 times lower in CV in Group 1 compared to Group 2 (Table 5).

Neuropsychiatric conditions

Median burden Unipolar depressive disorders, Bipolar disorder, Schizophrenia, Epilepsy, Post-traumatic stress, Panic disorder, were SZ 1.5 times lower in Group 1 compared to Group 2 (Table 5).

The median burden of alcohol use disorders in group 1 countries did not differ in CV from group 2 countries, but was 13% higher than in group 2 countries (Table 5. Figure 9).

Figure 9: Burden of Neurodegenerative Diseases in Country Groups 1 and 2.

Median burden Alzheimer and other dementias, Parkinson disease, Multiple sclerosis, Obsessive-compulsive disorder, Insomnia and Migraine were SR d 1.5 higher in country group 1 compared to country group 2 (Table 5. Figure 9).

Sense organ disease

The median burdens of Glaucoma, Cataracts, Refractive errors, Hearing loss, adult onset, and Macular degeneration and other were 1.8 times lower in group 1 than in group 2 (Table 5).

Cardiovascular diseases

Median Rheumatic heart disease and Hypertensive heart disease were 2-fold and 4-fold lower CV in country group 1 than in country group 2 (Table 5. Figure 10).

Figure 10: Burden of Cardio-vascular lung diseases in Groups 1 and 2 countries (percentage of error bars).

Median Ischaemic heart disease and Cerebrovascular disease CV did not differ between country groups 1 and 2 (Table 5. Figure 10).

The median burden of inflammatory heart diseases was CV in 1, 4 times higher in the 1st group of countries compared to the 2nd group of countries (Table 5 Figure 10).

Respiratory diseases

The median burdens of Chronic obstructive pulmonary disease and Asthma were 1.4 to 2 times lower CV in country group 1 compared with country group 2 (Table 5. Figure 10).

Digestive diseases

The median burden of all Digestive diseases: Peptic ulcer disease, Appendicitis, Genitourinary diseases, Nephritis and nephrosis, Benign prostatic hypertrophy, Skin diseases, Musculoskeletal diseases and Oral conditions in Group 1 countries was 1.5 times lower than in Group 2 (Table 5).

Injuries

The median burden of road traffic accidents and intentional injuries in country group 1 was lower than in country group 2 (Table 5).

But the Median Poisonings and Self-inflicted injuries were 1.5 times higher in SZ in Group 1 than in Group 2 (Table 5).

Thus, there was a wide variety of responses in groups 1 and 2 of countries to NCD risk factors.

Discussion

In accordance with the goal, NCD risk factors were compared between 36 countries in Europe (Group 1) and 36 countries in Asia-Pacific countries (Group 2). The income of group 1 SZ was 2.5 times higher than group 2. The geographical characteristics of groups 1 and 2 of the NW countries differed. Asian- The Pacific countries are 30° closer to the equator and 70° farther from Greenwich. These are rather conditional points, median points of huge regions. Quality of life, level of access to health care, environmental conditions, Human Development Index, LE of men and women were SZ in European countries above the Asia-Pacific countries.

But the gender difference in LE was SZ higher in group 1 countries (in Europe). In the 1st group of countries, in comparison with the 2nd group, the Happiness Index was lower than the Happiness Index (Bhutan Happiness 2006), which does not depend on economic and geographical conditions.

Globally recognized risk factors: Overweight, obesity, hypercholesterolemia, hyperglycemia, hypertension, high consumption of animal products, red meat, animal fats, animal and total macronutrients, and all types of alcoholic beverages were CV higher in group 1 countries compared to group 2 countries.

In this case, one should have expected a high level of NCD burden in group 1 of countries with convincingly high risk factors for NCDs [1,19,28]. But the total burden of NCDs in group 1 CV countries did not differ from group 2 countries, adjusted for Bonfcrroni (10243 vs. 12568 DALYs, $p \leq 0.0421$).

Indeed, in Group 1, 7 out of 13 cancers had 1.5 times higher CV than in Group 2. Group 1 CV countries had a higher burden of neurodegenerative diseases (Alzheimer's disease, Parkinson's disease and Multiple sclerosis) and suicide than group 2 countries. This is in line with the Global NCD risk factor understanding [28,31].

But the burden of alcoholism did not differ in SZ between Group 1 and Group 2 countries (813 versus 719 DALYs $p=0.17$). At the same time, consumption of alcoholic beverages was, on average, 11 times higher than in Group 1 countries. Moreover, in Europe (Group 1) the consumption of strong alcohol and beer was 5 times higher and the consumption of wine was 40 times higher than in Asia.

Pacific countries (group 2). And the share of alcoholic beverages in Dietary Patterns in the 1st group of countries was 2.5 times higher than in the 2nd group of countries (11% vs. 4% $p < 0.0001$). Thus, higher consumption of alcoholic beverages in European countries is not accompanied by a higher burden of alcoholism than in Asia-Pacific countries.

Group 1 countries had 1.5 to 2.5 times lower CV burden of Type 2 Diabetes, Endocrine Diseases, Depression, Sensory Organ Diseases, Respiratory, Cardiovascular and Digestive Diseases. This is contrary to the Global View of NCD risk factors [2,4,5,29-37]. Sometimes I want to quote the authors in full so as not to lose the important: "The conventional aetiological model of obesity and diabetes proposes a genetic predisposition and a precipitation by an unhealthy adult lifestyle. This hypothesis was challenged by David Barker who proposed that the intrauterine environment influences the risk of non-communicable diseases (NCDs). The original idea was based on fetal undernutrition because lower birth weight was associated with a higher risk of diabetes and heart disease. However, soon it was clear that the association was U shaped, and that the increased risk in large babies was driven by maternal obesity and diabetes. A number of human and animal studies have refined our ideas of 'fetal programming', which is now thought to be related to acquired chemical changes in DNA

(methylation), histones (acetylation and other) and the role of non-coding miRNAs. Maternal nutritional disturbances are the major programming stimulus, in addition to a deranged metabolism, infections, maternal stress, extreme atmospheric temperature, etc. The first demonstration of a link between fetal 'starvation' and future ill-health was in the Dutch Hunger Winter studies. In the prospective Pune Maternal Nutrition Study, we found that small and thin Indian babies were more adipose compared to larger English babies, and their higher risk of future diabetes was reflected in higher insulin and leptin and lower adiponectin concentrations in the cord blood. This phenotype was partly related to a deranged 1-carbon metabolism due to an imbalance in vitamin B12 (low) and folate (high) nutrition, which was also related to insulin resistance in the offspring. Maternal obesity and diabetes have made an increasing contribution to childhood obesity and diabetes at a young age. This was prominently shown in Pima Indians but is now obvious in all other populations. The best window of opportunity to prevent fetal programming of NCDs is in the periconceptional period. This is the period when gametogenesis, fertilisation, implantation, embryogenesis and placentation occur. Improving the nutrition and the health of young girls could make a substantial contribution to reducing the rapidly rising epidemic of NCDs in the world. This is referred to as 'primordial' prevention" [36].

Thus, European countries with high NCD risk factors are more successful than Asia-Pacific countries in coping with the burden of NCDs, probably due to high quality of life, health care and concern for environmental safety.

Conclusion

The research results showed that in 36 European countries (Group 1) all Global NCD risk factors were statistically significantly (SR) several times higher than in 36 Asia-Pacific countries (Group 2). Globally recognized risk factors: overweight, obesity, hypercholesterolemia, hyperglycemia, hypertension, high consumption of animal products, red meat, animal fats, animal and total macronutrients and all types of alcoholic beverages was higher in group 1 countries compared to group 2 countries [31]. But the total burden of NCDs in Group 1 CV countries did not differ from Group 2 (10243 versus 12568 DALYs, $p \leq 0.0421$).

In group 1 countries, 7 out of 13 cancers had CV 1.5 times higher than in group 2. Group 1 CV countries had a higher burden of Alzheimer's, Parkinson's, and Multiple Sclerosis, as well as Suicide, than Group 2 countries. This is in line with the Global Understanding of NCD Risk Factors.

But the burden of alcoholism did not differ in SZ between Group 1 and Group 2 countries (813 versus 719 DALYs p=0.17). At the same time, consumption of alcoholic beverages was, on average, 11 times higher than in Group 1 countries. Moreover, in Europe (Group 1), the consumption of strong alcohol and beer was 5 times higher, and the consumption of wine was 40 times higher than in Asia.

Pacific countries (group 2). And the share of all alcoholic beverages in Dietary Patterns in the 1st group of countries was 2.5 times higher than in the 2nd group of countries. Thus, higher consumption of alcoholic beverages in European countries is not accompanied by a higher burden of Alcoholism than in Asia-Pacific countries.

Group 1 countries had 1.5 to 2.5 times lower CV burden of Type 2 Diabetes, Endocrine Diseases, Depression, Sensory Organ Diseases, Respiratory, Cardiovascular and Digestive Diseases. This is contrary to the Global View of NCD risk factors.

Thus, European countries with high NCD risk factors are more successful than Asian countries.

Pacific countries are coping with the burden of NCDs, probably due to their high quality of life, health and environmental safety.

Conflict of Interest

The authors have no conflict of interest.

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