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"Relationship Between Spatial Disparities, Unsustainable Food Environments and Obesity Contingency"

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Presented By
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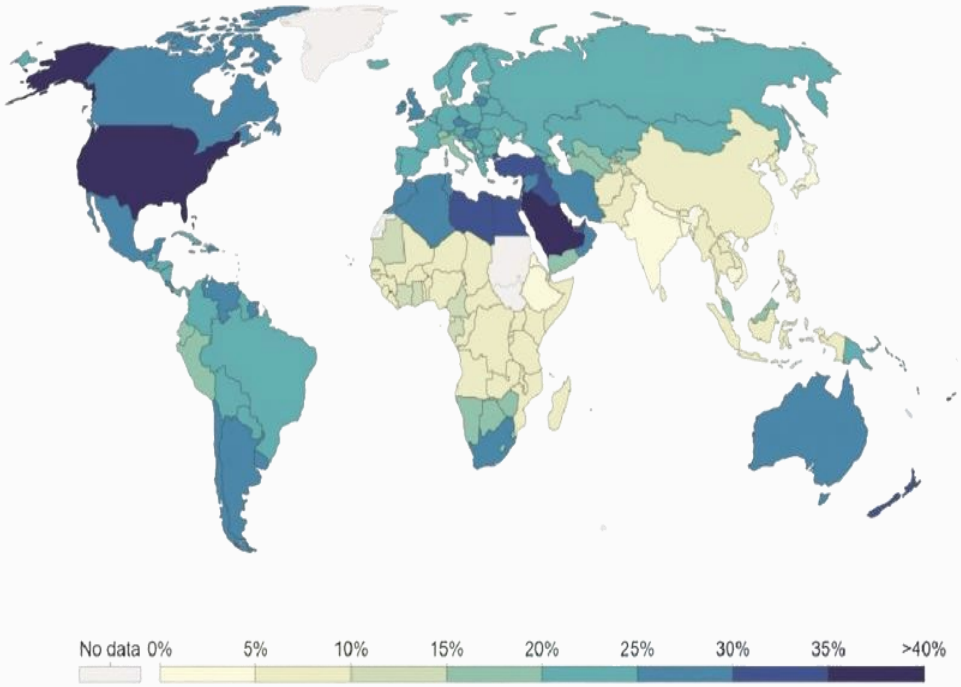
OBESITY,

has nearly tripled between 1975 and 2016, and has now reached pandemic dimensions. Trends in obesity prevalence have risen in all age groups, socioeconomic and ethnicities (GBD, 2019). In many countries, undernutrition and obesity coexist, and both can be consequences of food insecurity.

This evidence suggests that most of the world's population lives in countries where overweight and obesity are a bigger risk to health than underweight (World obesity, 2024). It is estimated that share of global **deaths as a consequence of obesity in 2019 was around 10%**, and this is almost double compared to 1990. The relationship between death rates and obesity prevalence is a positive one, and death rates tend to be higher in countries with higher obese individuals (our world in Data, 2024).

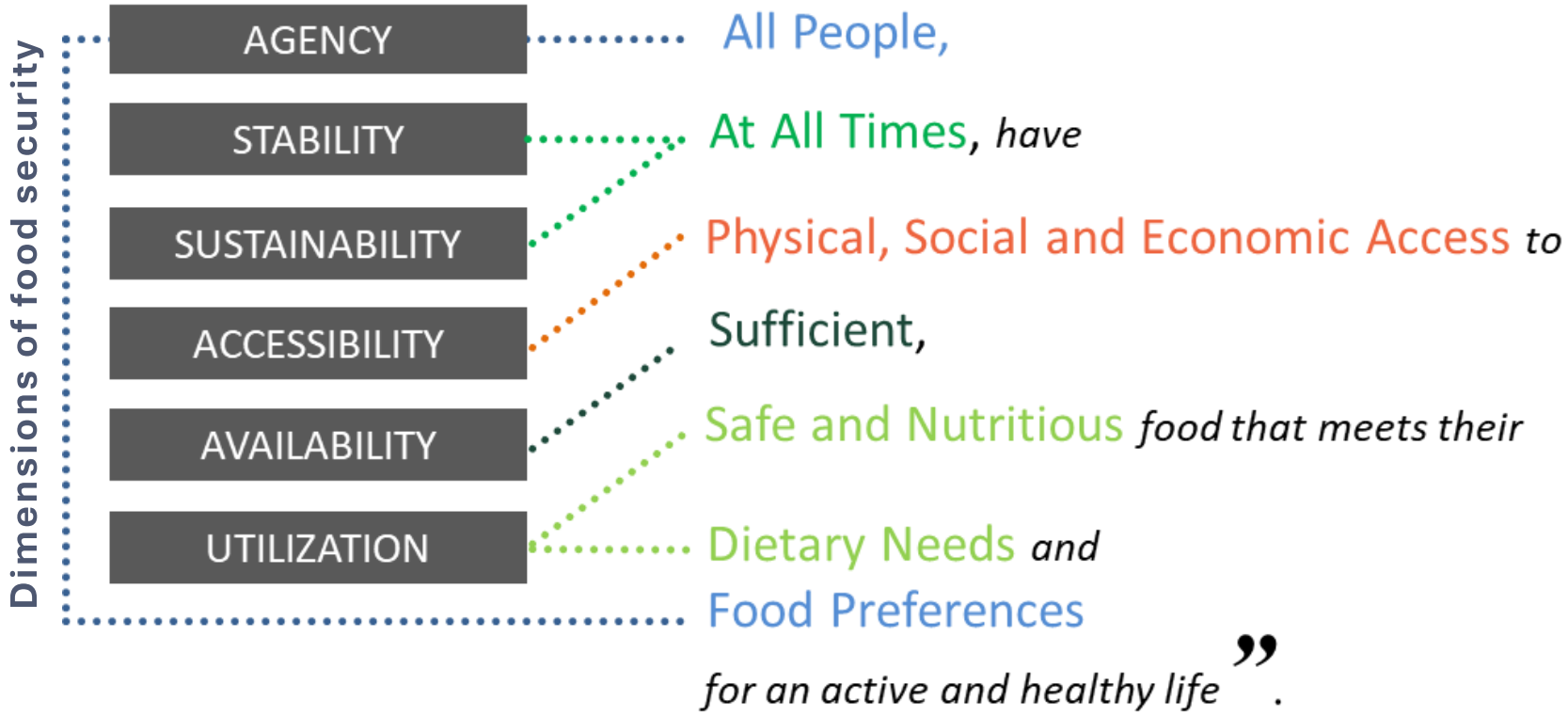
"By 2030, 1 in 5 women and 1 in 7 men, will be obese. Nations will not only fail to achieve the 2025 WHO target to prevent the rise in obesity at 2010 levels, but the number of individuals living with obesity is increasing worldwide. "



Share of adults with obesity 2016
Source: Our World in Data

"It is crucial to underline that economic disparities in society may cause heterogeneity in obesity prevalence."

“***Food Security*** *is a situation that exists when*



Available literature demonstrates that the association between food insecurity, income level (individual and national income), and risk for overweight and obesity is ambiguous and inconsistent (Biadgilign et al., 2021; Chen et al., 2016; Morales & Berkowitz, 2016; Nettle & Bateson, 2019). The gap in this subject is the lack of studies that examine the obesity prevalence from spatial disparities perspective, and an ambiguity and complexity in defining the relationship between income and obesity.

- It is anticipated that income has a positive relationship with obesity, as the income level increases, individuals' affordability improves which leads to afford excess food beyond the basic subsistence levels that leads to higher nutrient intake (Grecu & Rotthoff, 2015).
- On the other side, it can be assumed that if an increase in individuals' incomes is associated with a proportional increase in the likelihood of obesity, it will result in a positive linear relationship between national income and obesity prevalence. However, the thing is that as the income increases beyond a certain level, individuals' knowledge and over health, nutritious diet, self-care or benefits of physical activities would increase and reverse or mitigate the effect of individuals' incomes on the prevalence of obesity (Pampel, 2012).

“ Research Question ”

How does income level affect obesity prevalence, and does the higher income level reverse the obesity contingency?

A quantitative method designed to investigate the pattern of the income-obesity paradox and national socioeconomic-obesity prevalence relationship within the selected case studies and how strong these relationships are and differ across the analyzed case study countries.

- ***Selection* of the case studies (countries) based on the World Bank data (by income level and geographic region)**
- **Indicators for the quantitative analyses**
- **Identifying the appropriate model specification to understand the relationship between the indicators**

Selection of the Countries

- The 171 countries selected for the analyses. The country classification is based on the World Bank data, by income level and geographic region. Countries (Economies) are currently divided into four income groupings: **low**, **lower-middle**, **upper-middle**, and **high-income**, and are measured using gross national income (GNI) per capita, in U.S. dollars

Indicators for Quantitative Analyses

- **GNI per Capita (Gross National Income per Capita)**

Data source: World Bank

- **Obesity Rate**

Data source: World Obesity Federation 2022

- **Annual Obesity Growth Rate**

Data source: World Obesity Federation Atlas 2024

The Statistical Measures Used

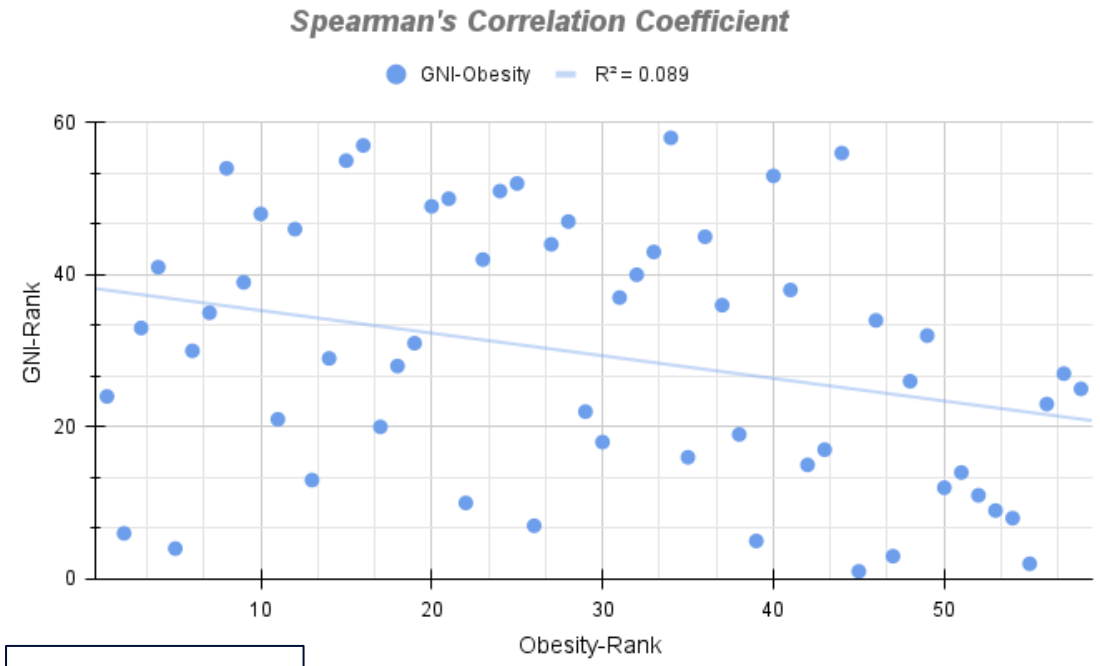
- In this study the **Spearman's Correlation Coefficient** was used in order to test the strength and direction, whether positive or negative, of the correlation (relationship or connection) between two variables.

1. Calculation of the obesity rate of 2024 by using obesity rate of 2022 and annual obesity growth rate.
2. Mapping the Spearman's Correlation Coefficient Chart

1. The Statistical Measurement

High-income countries ($14,006 or more)

Country	GNI	Obesity Rate	Annual Obesity Growth
Japan	39350	5.67%	0.90%
Korea, Rep.	35490	7.52%	1.90%
France	45180	10.20%	1%
Switzerland	95070	12.87%	1.60%
Denmark	73340	13.88%	1.20%
Singapore	70590	14.39%	1.50%
Netherlands	62540	15.37%	1.30%
Austria	55030	15.98%	1%
Sweden	60480	16.07%	1.50%
Spain	32830	16.44%	0.90%
Italy	37920	17.99%	0.50%
Luxembourg	83980	19.58%	1.80%
Slovenia	30860	20.21%	0.70%
Norway	102910	20.24%	1.80%
Bulgaria	14280	20.90%	-0.80%
Belgium	54580	20.92%	1%
Germany	54800	20.99%	0.50%
Portugal	26150	21.97%	0.90%
Seychelles	16940	22.13%	3.70%
Iceland	80400	22.42%	1.50%
Finland	53230	22.46%	1.10%
Estonia	27620	23.37%	0.20%
Trinidad and Tobago	21000	23.97%	2.10%
Israel	54650	24.19%	2.20%
Russian Federation	14250	24.82%	0.10%
Latvia	22630	25.46%	-0.50%
Lithuania	25080	25.71%	-0.60%
Czechia	27370	26%	0.40%
Canada	54040	27.65%	1.70%
United Kingdom	47700	28.35%	1.30%
Oman	20470	30.20%	2.30%
Greece	22590	30.30%	0.40%
Ireland	78970	30.45%	2%
Panama	17870	31.52%	2.70%
Hungary	19670	31.70%	0.10%
Slovak Republic	22790	31.73%	0.50%
Australia	63150	32.21%	1.90%
Uruguay	19700	32.40%	1.20%
Poland	19900	32.51%	0.50%
Cyprus	32960	33.15%	1.60%
Malta	34750	33.43%	0.90%
United Arab Emirates	49020	33.62%	1.50%
Costa Rica	14260	33.66%	2.10%
Chile	15800	34.10%	1.30%
Brunei Darussalam	34480	34.11%	3.10%
Hong Kong SAR, China	55170	34.25%	2.50%
Croatia	20590	34.94%	0.20%
New Zealand	48220	35.53%	1.80%
Antigua and Barbuda	20200	36.53%	3.50%
Puerto Rico	25240	38%	1.90%
Romania	16660	38.49%	0.20%
Bahrain	28300	40.83%	1.70%
Bahamas, The	33330	43.60%	1.90%
United States	80450	43.95%	1.40%
Barbados	22870	44.30%	1.40%
Saudi Arabia	31860	44.51%	2.40%
Qatar	79430	45.06%	1.20%
Kuwait	41320	45.95%	1.70%



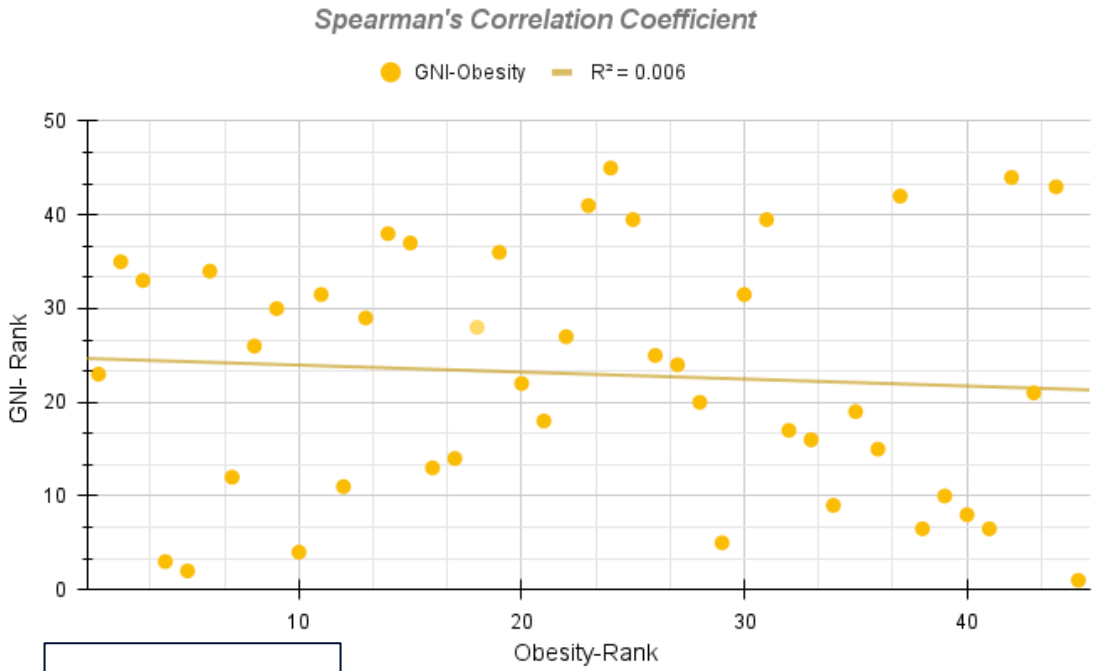
ρ= -0.297609

No	Coefficient	Correlation Coefficient Classification
1	0	No correlation
2	0-0.2	Very weak
3	0.21-0.40	Weak
4	0.41-0.60	Moderate
5	0.61-0.80	Strong
6	0.81-0.99	Very strong
7	1	Perfect

Source: Roflin & Zulvia (2021)

Upper- Middle-income countries ($4,516 TO $14,005)

Country	GNI	Obesity Rate	Annual Growth
China	13390	8.85%	2.80%
Indonesia	4810	12.46%	4%
Thailand	7200	16.43%	3.10%
Cabo Verde	4780	17.68%	4%
Montenegro	11590	19.02%	0.90%
Maldives	11070	19.17%	3.50%
Kazakhstan	10730	19.72%	1.90%
Mauritius	11590	20.30%	1.80%
Equatorial Guinea	4840	20.49%	4.90%
Bosnia and Herzeg	8280	22.06%	0.20%
Belarus	7790	22.18%	0.30%
Serbia	10760	22.97%	-0.30%
Turkmenistan	8250	23.42%	2.80%
Gabon	7930	23.93%	4.40%
Ukraine	4950	23.98%	-0.90%
Moldova	6200	24.01%	0.70%
Malaysia	11710	24.10%	3.70%
Albania	7680	24.65%	0.70%
Colombia	6810	25.26%	1.90%
Armenia	6780	25.41%	0.70%
Algeria	4950	26.01%	2.90%
Iran, Islamic Rep.	4650	26.11%	2%
Mongolia	4870	26.24%	2.80%
Azerbaijan	6660	28.49%	2.10%
North Macedonia	7900	28.64%	0.40%
Peru	7090	29.43%	2.30%
Guatemala	5480	29.54%	3.50%
Ecuador	6590	29.87%	2.80%
Brazil	9280	30%	1.90%
Dominican Republ	9710	31.83%	2.60%
Suriname	5200	31.88%	3.40%
El Salvador	4960	32.65%	2.10%
South Africa	6480	32.80%	2.30%
Grenada	10470	33.45%	3.70%
Jamaica	6200	35.66%	1.60%
Turkiye	11730	35.70%	1.90%
Paraguay	6220	35.83%	2.70%
Georgia	6710	35.90%	0.60%
St. Vincent and th	10300	36.27%	3.10%
Fiji	5680	36.39%	2.10%
Argentina	12890	37.64%	1.70%
Mexico	11980	38.42%	2.10%
Libya	5940	39.91%	2.60%
Iraq	5640	44.61%	3.80%
Belize	6890	46.04%	3.10%



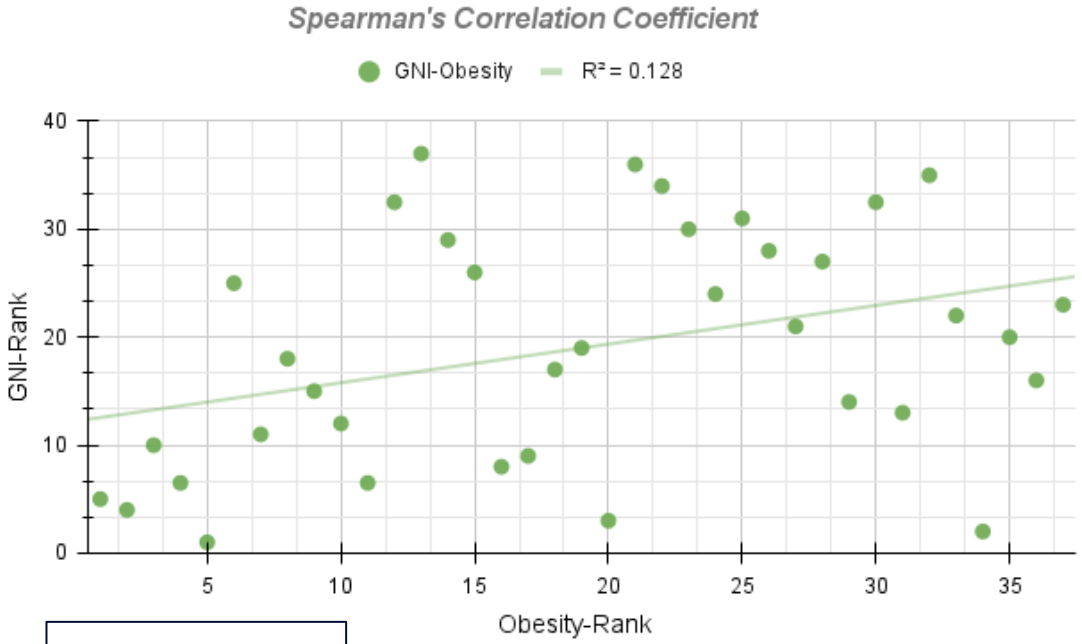
ρ= -0.074447

No	Coefficient	Correlation Coefficient Classification
1	0	No correlation
2	0-0.2	Very weak
3	0.21-0.40	Weak
4	0.41-0.60	Moderate
5	0.61-0.80	Strong
6	0.81-0.99	Very strong
7	1	Perfect

Source: Roflin & Zulvia (2021)

Lower- Middle-income countries ($1,146 TO $4,515)

Country	GNI	Obesity Rate	Annual Growth
Cambodia	2390	4.91%	4.40%
Bangladesh	2880	5.93%	4.70%
India	2540	8.14%	4.10%
Philippines	4320	9.75%	4.30%
Congo, Rep.	2450	9.76%	5.10%
Senegal	1630	11.35%	5.20%
Sri Lanka	3540	11.58%	3.20%
Haiti	1760	11.81%	3.40%
Djibouti	3400	12.78%	4.60%
Angola	2120	13.26%	6.10%
Cote d'Ivoire	2470	13.41%	5.30%
Kenya	2110	14.25%	5.20%
Nigeria	1880	14.29%	5.50%
Ghana	2360	14.58%	4.80%
Zimbabwe	2060	15.50%	4.40%
Cameroon	1690	17.15%	5.30%
Comoros	1610	18.29%	4.30%
Namibia	4280	18.72%	3.50%
Sao Tome and Pr	2580	19.79%	7.40%
Papua New Guin	2820	23.42%	5.20%
Morocco	3760	23.68%	2.50%
Vanuatu	3820	23.91%	4.10%
Mauritania	2130	25.65%	5.70%
Solomon Islands	2100	26.00%	5.70%
Pakistan	1460	26.21%	5.20%
Kyrgyz Republic	1760	28.45%	3%
Tunisia	3840	28.78%	1.90%
Bolivia	3620	31.25%	2.90%
Honduras	2890	32.47%	3.50%
Uzbekistan	2700	32.64%	2.60%
Eswatini	3690	32.72%	3.30%
Nicaragua	2350	36.63%	3%
Jordan	4420	41.94%	2.50%
Egypt, Arab Rep.	3840	48.27%	2.90%
Kiribati	3740	50.24%	3.50%
Micronesia, Fed.	4250	51.01%	2.90%
Samoa	4200	53.38%	2.30%



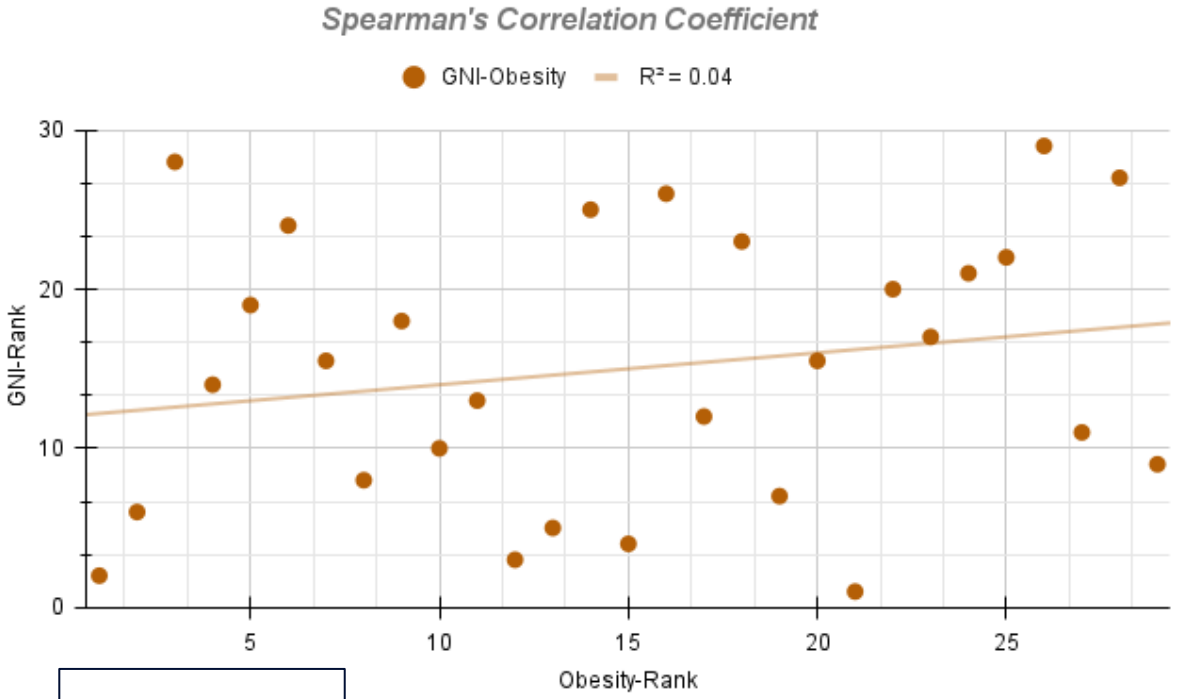
ρ= -0.358150

No	Coefficient	Correlation Coefficient Classification
1	0	No correlation
2	0-0.2	Very weak
3	0.21-0.40	Weak
4	0.41-0.60	Moderate
5	0.61-0.80	Strong
6	0.81-0.99	Very strong
7	1	Perfect

Source: Roflin & Zulvia (2021)

Low-income countries ($1,145 OR LESS)

Country	GNI	Obesity Rate	Annual Growth
Ethiopia	1110	3.23%	5.50%
Madagascar	510	4.94%	5.40%
Rwanda	990	5.56%	5.60%
Burundi	220	5.95%	6.20%
Niger	620	7.04%	6.50%
Congo, Dem. Rep	630	7.61%	5.10%
Burkina Faso	860	7.77%	6.10%
Chad	670	7.86%	5.90%
Nepal	1430	7.90%	4.90%
Sierra Leone	870	8.09%	5.10%
Myanmar	1230	8.30%	3.80%
Malawi	600	8.82%	5.90%
Uganda	970	9.08%	6.20%
Central African R	530	10.69%	5.70%
Guinea	1350	10.80%	5.30%
Mozambique	540	11.68%	5.70%
Zambia	1290	12.44%	5.20%
Benin	1390	12.79%	5.40%
Guinea-Bissau	940	13.05%	5.50%
Togo	1000	13.21%	5.10%
Mali	840	13.34%	6.20%
Tanzania	1220	14.53%	5.90%
Gambia, The	870	17.15%	5.80%
Somalia	590	17.28%	7.60%
Liberia	710	19.89%	6.80%
Sudan	880	20.05%	7.20%
Afghanistan	380	21.78%	5.40%
Lesotho	1250	23.11%	3.10%
Tajikistan	1400	26.46%	3.60%



ρ= 0.20076

No	Coefficient	Correlation Coefficient Classification
1	0	No correlation
2	0-0.2	Very weak
3	0.21-0.40	Weak
4	0.41-0.60	Moderate
5	0.61-0.80	Strong
6	0.81-0.99	Very strong
7	1	Perfect

Source: Roflin & Zulvia (2021)

2.0 Classification Based on Obesity Rate

Group 1:
(0.00% to 10.00%)

Country	Obesity Rate	Annual Growth Rate	WHO region
Viet Nam	2.21%	4%	Western Pacific Region
Timor-Leste	2.68%	5.40%	South-East Asia Region
Ethiopia	3.23%	5.50%	African Region
Cambodia	4.91%	4.40%	Western Pacific Region
Madagascar	4.94%	5.40%	African Region
Rwanda	5.56%	5.60%	African Region
Japan	5.67%	0.90%	Western Pacific Region
Bangladesh	5.93%	4.70%	South-East Asia Region
Burundi	5.95%	6.20%	African Region
Niger	7.04%	6.50%	African Region
Korea, Rep.	7.52%	1.90%	Western Pacific Region
Congo, Dem. Rep.	7.61%	5.10%	African Region
Burkina Faso	7.77%	6.10%	African Region
Chad	7.86%	5.90%	African Region
Nepal	7.90%	4.90%	South-East Asia Region
Sierra Leone	8.09%	5.10%	African Region
India	8.14%	4.10%	South-East Asia Region
Myanmar	8.30%	3.80%	South-East Asia Region
Malawi	8.82%	5.90%	African Region
China	8.85%	2.80%	Western Pacific Region
Uganda	9.08%	6.20%	African Region
Philippines	9.75%	4.30%	Western Pacific Region
Congo, Rep.	9.76%	5.10%	African Region

High-Income
Upper-Middle Income
Lower-Middle Income
Low Income

Green	7	30.43%
Blue	2	8.7%
Red	13	56.52%
Yellow	1	4.35%
Total of	**23 Cells**	

WHO African Region	12
WHO Region of the Americas	0
WHO South-East Asia Region	5
WHO European Region	0
WHO Eastern Mediterranean Region	0
WHO Western Pacific Region	6

Group 2:
(10.00% to 20.00%)

Country	Obesity Rate	WHO region
France	10.20%	European Region
Central African Rep	10.69%	African Region
Guinea	10.80%	African Region
Senegal	11.35%	African Region
Sri Lanka	11.58%	South-East Asia Region
Mozambique	11.68%	African Region
Haiti	11.81%	Region of the Americas
Zambia	12.44%	African Region
Indonesia	12.46%	South-East Asia Region
Djibouti	12.78%	Eastern Mediterranean R
Benin	12.79%	African Region
Switzerland	12.87%	European Region
Guinea-Bissau	13.05%	African Region
Togo	13.21%	African Region
Angola	13.26%	African Region
Mali	13.34%	African Region
Cote d'Ivoire	13.41%	African Region
Denmark	13.88%	European Region
Kenya	14.25%	African Region
Nigeria	14.29%	African Region
Singapore	14.39%	Western Pacific Region
Tanzania	14.53%	African Region
Ghana	14.58%	African Region
Netherlands	15.37%	European Region
Zimbabwe	15.50%	African Region
Austria	15.98%	European Region
Sweden	16.07%	European Region
Thailand	16.43%	South-East Asia Region
Spain	16.44%	European Region
Cameroon	17.15%	African Region
Gambia, The	17.15%	African Region
Somalia	17.28%	
Cabo Verde	17.68%	African Region
Italy	17.99%	European Region
Comoros	18.29%	African Region
Namibia	18.72%	African Region
Montenegro	19.02%	European Region
Maldives	19.17%	South-East Asia Region
Luxembourg	19.58%	European Region
Kazakhstan	19.72%	European Region
Sao Tome and Prin	19.79%	African Region
Liberia	19.89%	African Region

High-Income
Upper-Middle Income
Lower-Middle Income
Low Income

Green	13	30.95%
Blue	10	23.81%
Red	12	28.57%
Yellow	5	11.90%
Total of	**42 Cells**	

WHO African Region	23
WHO Region of the Americas	1
WHO South-East Asia Region	4
WHO European Region	11
WHO Eastern Mediterranean Region	1
WHO Western Pacific Region	1

Group 3:
(20.00% to 30.00%)

Country	Obesity Rate	WHO region
Sudan	20.05%	African Region
Slovenia	20.21%	European Region
Norway	20.24%	European Region
Mauritius	20.30%	African Region
Equatorial Guinea	20.49%	African Region
Bulgaria	20.90%	European Region
Belgium	20.92%	European Region
Germany	20.99%	European Region
Afghanistan	21.78%	Eastern Mediterranean Re
Portugal	21.97%	European Region
Bosnia and Herzegov	22.06%	European Region
Seychelles	22.13%	African Region
Belarus	22.18%	European Region
Iceland	22.42%	European Region
Finland	22.46%	European Region
Serbia	22.97%	European Region
Lesotho	23.11%	African Region
Estonia	23.37%	European Region
Turkmenistan	23.42%	European Region
Papua New Guinea	23.42%	Western Pacific Region
Morocco	23.68%	Eastern Mediterranean Re
Vanuatu	23.91%	Western Pacific Region
Gabon	23.93%	African Region
Trinidad and Tobago	23.97%	Region of the Americas
Ukraine	23.98%	European Region
Moldova	24.01%	European Region
Malaysia	24.10%	Western Pacific Region
Israel	24.19%	European Region
Albania	24.65%	European Region
Russian Federation	24.82%	European Region
Colombia	25.26%	Region of the Americas
Armenia	25.41%	European Region
Latvia	25.46%	European Region
Mauritania	25.65%	African Region
Lithuania	25.71%	European Region
Czechia	26%	European Region
Solomon Islands	26.00%	Western Pacific Region
Algeria	26.01%	African Region
Iran, Islamic Rep.	26.11%	Eastern Mediterranean Re
Pakistan	26.21%	Eastern Mediterranean Re
Mongolia	26.24%	Western Pacific Region
Tajikistan	26.46%	European Region
Canada	27.65%	Region of the Americas
United Kingdom	28.35%	European Region
Kyrgyz Republic	28.45%	European Region
Azerbaijan	28.49%	European Region
North Macedonia	28.64%	European Region
Tunisia	28.78%	Eastern Mediterranean Re
Peru	29.43%	Region of the Americas
Guatemala	29.54%	Region of the Americas
Ecuador	29.87%	Region of the Americas
Brazil	30%	Region of the Americas

High-Income
Upper-Middle Income
Lower-Middle Income
Low Income

Green	8	15.38%
Blue	18	34.62%
Red	4	7.69%
Yellow	21	40.38%
Total of	**52 Cells**	

WHO African Region	7
WHO Region of the Americas	7
WHO South-East Asia Region	0
WHO European Region	27
WHO Eastern Mediterranean Region	5
WHO Western Pacific Region	5

Group 4:
(30.00% to 40.00%)

Country	Obesity Rate	WHO region
Oman	30.20%	Eastern Mediterranean Region
Greece	30.30%	European Region
Ireland	30.45%	European Region
Bolivia	31.25%	Region of the Americas
Panama	31.52%	Region of the Americas
Hungary	31.70%	European Region
Slovak Republic	31.73%	European Region
Dominican Republic	31.83%	Region of the Americas
Suriname	31.88%	Region of the Americas
Australia	32.21%	Western Pacific Region
Uruguay	32.40%	Region of the Americas
Honduras	32.47%	Region of the Americas
Poland	32.51%	European Region
Uzbekistan	32.64%	European Region
El Salvador	32.65%	Region of the Americas
Eswatini	32.72%	African Region
South Africa	32.80%	African Region
Cyprus	33.15%	European Region
Malta	33.43%	European Region
Grenada	33.45%	Region of the Americas
United Arab Emirates	33.62%	Eastern Mediterranean Region
Costa Rica	33.66%	Region of the Americas
Chile	34.10%	Region of the Americas
Brunei Darussalam	34.11%	Western Pacific Region
Hong Kong SAR, Chin	34.25%	
Croatia	34.94%	European Region
New Zealand	35.53%	European Region
Jamaica	35.66%	Region of the Americas
Turkiye	35.70%	European Region
Paraguay	35.83%	Region of the Americas
Georgia	35.90%	European Region
St. Vincent and the G	36.27%	Region of the Americas
Fiji	36.39%	Western Pacific Region
Antigua and Barbuda	36.53%	Region of the Americas
Nicaragua	36.63%	Region of the Americas
Argentina	37.64%	Region of the Americas
Puerto Rico	38%	Region of the Americas
Mexico	38.42%	Region of the Americas
Romania	38.49%	European Region
Libya	39.91%	Eastern Mediterranean Region

High-Income
Upper-Middle Income
Lower-Middle Income
Low Income

Green	5	12.5%
Blue	21	52.5%
Red	0	0%
Yellow	14	35.0%
Total of	**40 Cells**	

WHO African Region	2
WHO Region of the Americas	18
WHO South-East Asia Region	0
WHO European Region	13
WHO Eastern Mediterranean Region	3
WHO Western Pacific Region	3

Group 5:

(40.00% to 50.00%)

Country	Obesity Rate	WHO region
Bahrain	40.83%	Eastern Mediterranean Region
Jordan	41.94%	Eastern Mediterranean Region
Bahamas, The	43.60%	Region of the Americas
United States	43.95%	Region of the Americas
Barbados	44.30%	Region of the Americas
Saudi Arabia	44.51%	Eastern Mediterranean Region
Iraq	44.61%	Eastern Mediterranean Region
Qatar	45.06%	Eastern Mediterranean Region
Kuwait	45.95%	Eastern Mediterranean Region
Belize	46.04%	Region of the Americas
Egypt, Arab Rep.	48.27%	Eastern Mediterranean Region
Kiribati	50.24%	Western Pacific Region
Micronesia, Fed. St	51.01%	Western Pacific Region
Samoa	53.38%	Western Pacific Region

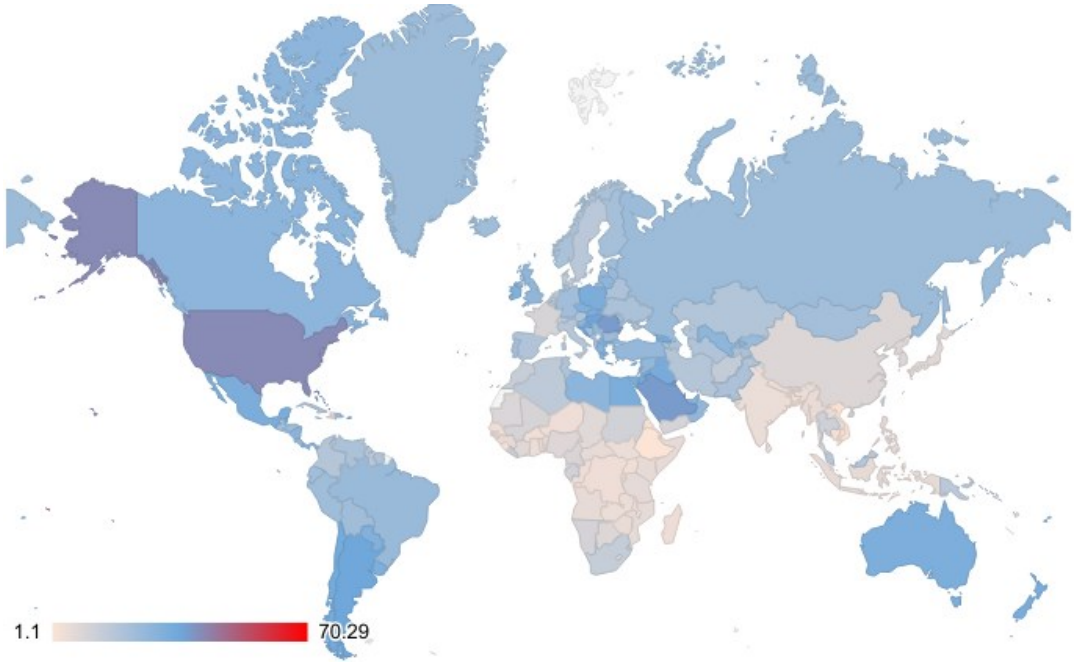
High-Income
Upper-Middle Income
Lower-Middle Income
Low Income

Green	5	35.71%
Blue	7	50.0%
Red	0	0%
Yellow	2	14.29%
Total of	**14 Cells**	

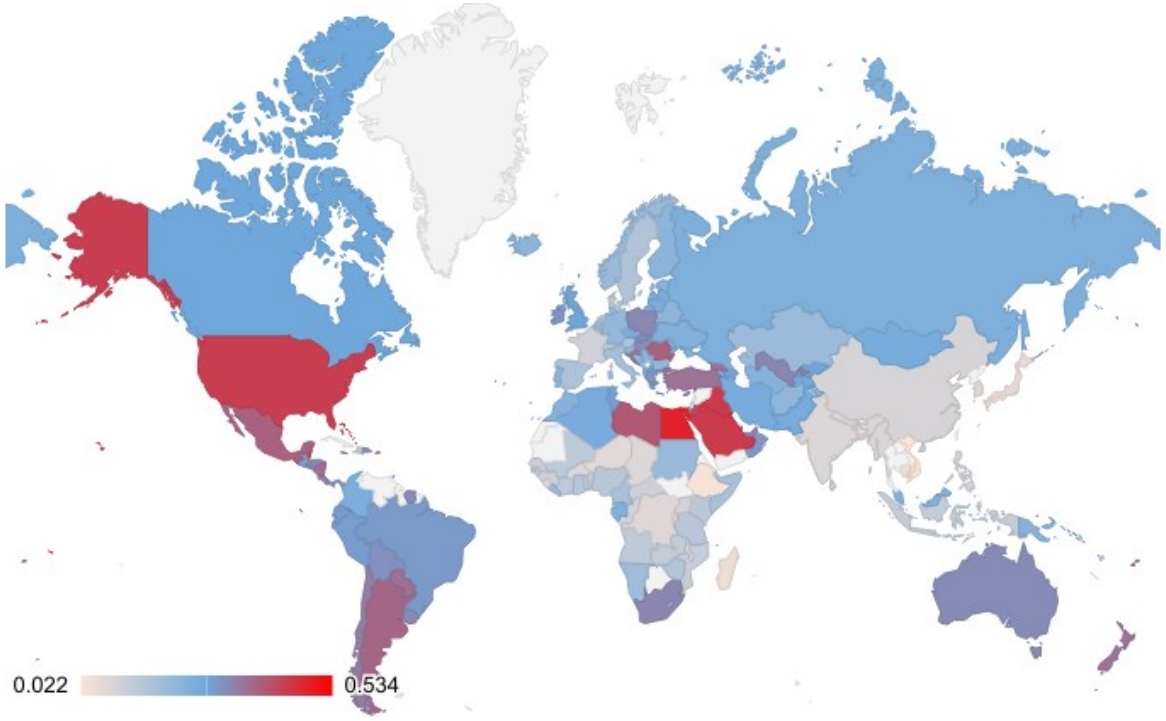
WHO African Region	0
WHO Region of the Americas	4
WHO South-East Asia Region	0
WHO European Region	0
WHO Eastern Mediterranean Region	7
WHO Western Pacific Region	3

The Global Distribution of Obesity

Obesity is defined as having a body-mass index (BMI) equal to or greater than 30. BMI is a person's weight in kilograms divided by their height in meters squared. Shown is the share of total deaths, from any cause, with obesity as an attributed risk factor.



Obesity Rate, 2022



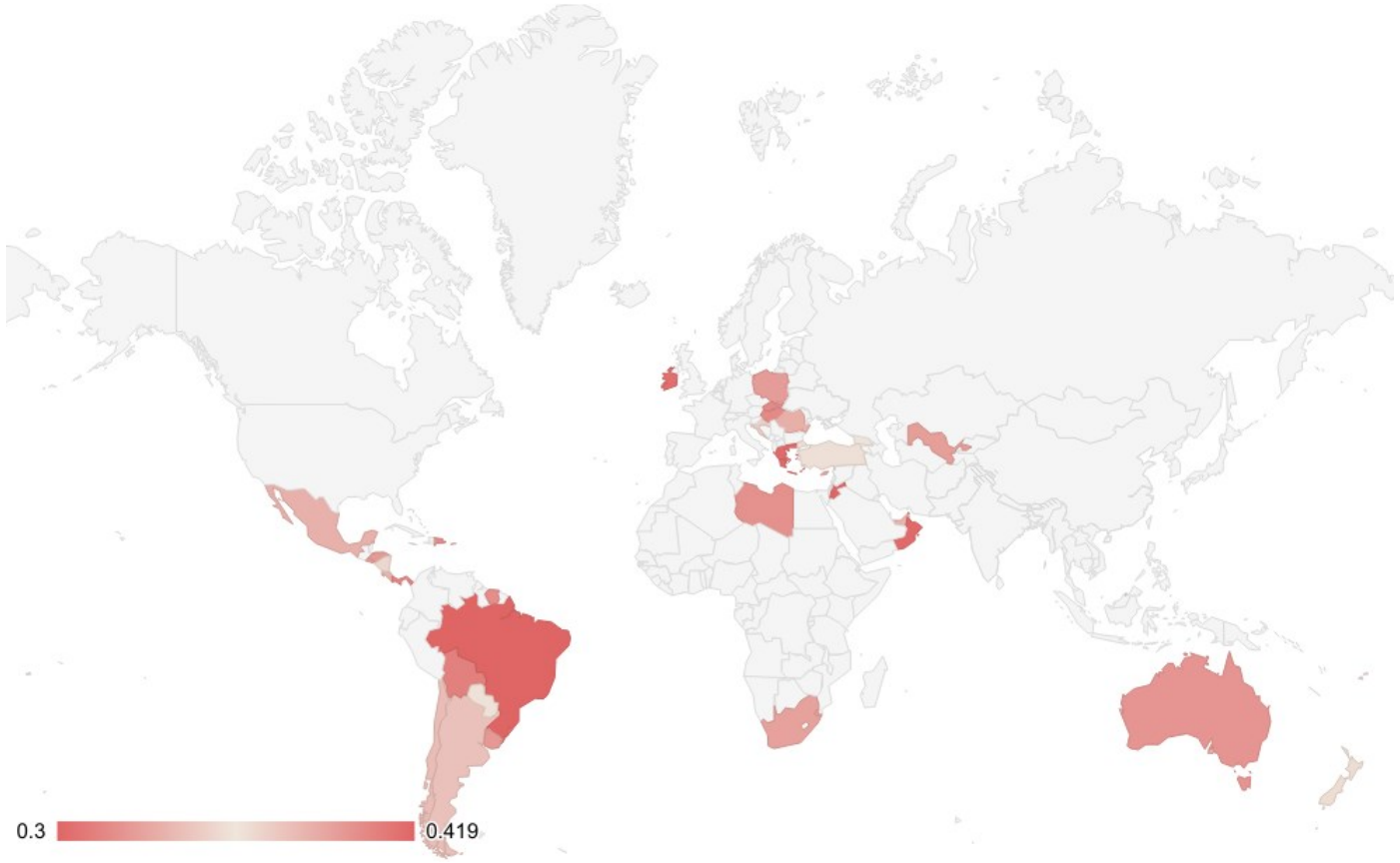
Obesity Rate, 2024

Data source: World Bank, World Obesity Federation 2022/ **Figure:** Author's contribution

Previously, it was assumed that low socioeconomic status has been associated with a higher prevalence of obesity and chronic diseases in developed countries. However, the relationship between socioeconomic status and obesity in developing countries has been reported to have similarities with that in developed countries, and apparently based on the analyses, it is observed that high-income economies (developed countries) and upper-lower economies show the same pattern and obesity rates as low-income economic countries.

- ***High-Income countries*****,** there is **a weak negative monotonic relationship** between GNI and obesity rate. In other words, as obesity increases (i.e., lower obesity rates), GNI rank tends to improve (i.e., higher income), but not strongly or consistently.
- ***Upper-Middle income countries*****,** there is a **very weak positive correlation** between income level and obesity rate. This suggests that **higher national income may be slightly associated with lower obesity rankings** However, the correlation is too weak to draw strong conclusions.
- ***Lower- Middle-income countries*****,** there is a **moderate negative monotonic correlation** between **GNI and obesity rate.** As income improves, obesity prevalence tends to decline This supports the idea that **wealthier countries may have better access to health education, healthcare, and healthier lifestyles**, which **reduces obesity.**
- ***Low-income countries*****, a very weak positive monotonic relationship**, indicating that higher obesity ranks are **slightly associated** with higher GNI ranks. However, this is **not practically significant**.

Country	GNI	Obesity Rate
Oman	20470	30.20%
Greece	22590	30.30%
Ireland	78970	30.45%
Panama	17870	31.52%
Hungary	19670	31.70%
Slovak Republic	22790	31.73%
Australia	63150	32.21%
Uruguay	19700	32.40%
Poland	19900	32.51%
Cyprus	32960	33.15%
Malta	34750	33.43%
United Arab Emirates	49020	33.62%
Costa Rica	14260	33.66%
Chile	15800	34.10%
Brunei Darussalam	34480	34.11%
Hong Kong SAR, China	55170	34.25%
Croatia	20590	34.94%
New Zealand	48220	35.53%
Antigua and Barbuda	20200	36.53%
Puerto Rico	25240	38%
Romania	16660	38.49%
Bahrain	28300	40.83%
Brazil	9280	30%
Dominican Republic	9710	31.83%
Suriname	5200	31.88%
El Salvador	4960	32.65%
South Africa	6480	32.80%
Grenada	10470	33.45%
Jamaica	6200	35.66%
Turkiye	11730	35.70%
Paraguay	6220	35.83%
Georgia	6710	35.90%
St. Vincent and the Grenadines	10300	36.27%
Fiji	5680	36.39%
Argentina	12890	37.64%
Mexico	11980	38.42%
Libya	5940	39.91%
Bolivia	3620	31.25%
Honduras	2890	32.47%
Uzbekistan	2700	32.64%
Eswatini	3690	32.72%
Nicaragua	2350	36.63%
Jordan	4420	41.94%



WHO Regions	Number of Countries	(0-10%)	(10-20%)	(20-30%)	(30-40%)	(40-50%)
WHO African Region	44	12	23	7	2	0
WHO Region of Americas	30	0	1	7	18	4
WHO European Region	51	0	11	27	13	0
WHO South East Asia Region	9	5	4	0	0	0
WHO Region oF Eastern Mediterranean	16	0	1	5	3	7
WHO Western Pacific Region	18	6	1	5	3	3

THANK YOU FOR YOUR ATTENTION

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AESOP 2025 CONGRESS

Istanbul, 7-11 July

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