Healthy lifestyle analysis for 2021

Stefani Kondić

Cities with most sunshine hours

	City	Rank	Sunshine hours(City)	Cost of a bottle of water(City)	Obesity levels(Country)	Life expectancy(years) (Country)	Pollution(Index score) (City)	Annual avg. hours worked	Happiness levels(Country)	Outdoor activities(City)	Number of take out places(City)	Cost o membe
22	Cairo	23	3542.0	0.16	32.0	70.7	91.74	NaN	4.15	323	250	
20	Tel Aviv	21	3311.0	1.63	26.1	81.9	47.28	1898.0	7.12	139	420	
24	Los Angeles	25	3254.0	1.52	36.2	78.8	66.07	1779.0	6.94	223	1439	
38	Johannesburg	39	3124.0	0.59	28.3	56.3	61.83	NaN	4.81	194	492	
33	San Francisco	34	3062.0	1.60	36.2	78.8	47.36	1779.0	6.94	242	1031	

Cities with least sunshine hours

	City	Rank	Sunshine hours(City)	Cost of a bottle of water(City)	Obesity levels(Country)	Life expectancy(years) (Country)	Pollution(Index score) (City)	Annual avg. hours worked	Happiness levels(Country)	Outdoor activities(City)	Number of take out places(City)	Cost of a m... membership
23	Taipei	24	1405.0	0.57	6.2	75.4	49.32	NaN	5.12	134	717	
27	Dublin	28	1453.0	1.40	25.3	80.5	40.07	1772.0	7.09	159	659	
32	Brussels	33	1546.0	2.11	22.1	80.4	62.67	1583.0	6.86	55	988	
36	Zurich	37	1566.0	3.20	19.5	82.6	17.31	1557.0	7.56	69	538	
7	Berlin	8	1626.0	1.55	22.3	80.6	39.41	1386.0	7.07	254	1729	

Cities with lowest and highest life expectancy

	City	Rank	Sunshine hours(City)	Cost of a bottle of water(City)	Obesity levels(Country)	Life expectancy(years) (Country)	Pollution(Index score) (City)	Annual avg. hours worked	Happiness levels(Country)	Outdoor activities(City)	Number of take out places(City)	Cost o membe
38	Johannesburg	39	3124.0	0.59	28.3	56.3	61.83	NaN	4.81	194	492	
25	Mumbai	26	2584.0	0.15	3.9	67.3	82.84	NaN	3.57	187	1183	
16	Jakarta	17	2983.0	0.21	6.9	68.5	84.39	NaN	5.28	114	833	
42	Moscow	43	1901.0	0.41	23.1	69.5	57.63	1965.0	5.54	322	3206	
22	Cairo	23	3542.0	0.16	32.0	70.7	91.74	NaN	4.15	323	250	

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28	Tokyo	29	1877.0	0.76	4.3	83.2	42.84	1644.0	5.87	387	5802	
6	Fukuoka	7	2769.0	0.78	4.3	83.2	NaN	1644.0	5.87	35	539	
39	Milan	40	1915.0	1.15	19.9	82.7	67.19	1718.0	6.38	110	2396	
36	Zurich	37	1566.0	3.20	19.5	82.6	17.31	1557.0	7.56	69	538	
19	Geneva	20	NaN	2.62	19.5	82.6	27.25	1557.0	7.56	44	444	

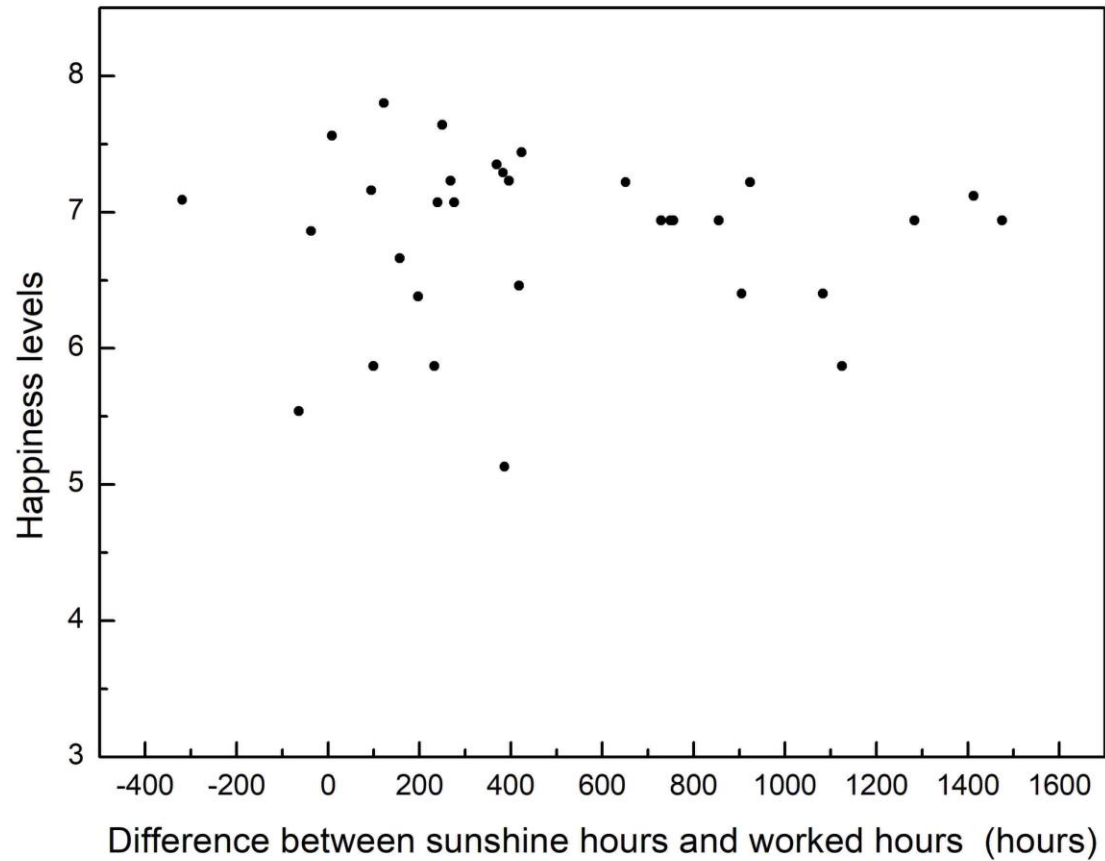# Cities lowest and highest pollution index

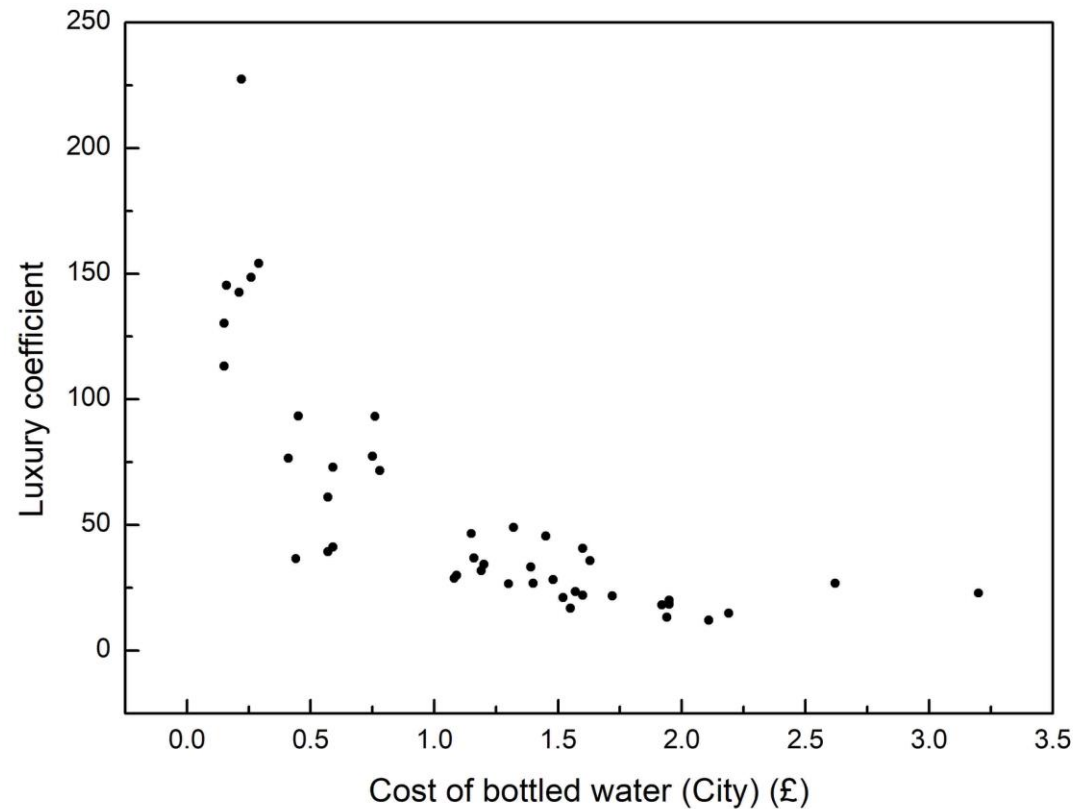| City	Rank	Sunshine hours(City)	Cost of a bottle of water(City)	Obesity levels(Country)	Life expectancy(years) (Country)	Pollution(Index score) (City)	Annual avg. hours worked	Happiness levels(Country)	Outdoor activities(City)	Number of take out places(City)	Cost of a monthly gym membership(City)
Helsinki	6	1662.0	1.60	22.2	80.4	13.08	1540.0	7.80	113	309	35.23
Zurich	37	1566.0	3.20	19.5	82.6	17.31	1557.0	7.56	69	538	73.11
Vienna	3	1884.0	1.94	20.1	81.0	17.33	1501.0	7.29	132	1008	25.74
ockholm	4	1821.0	1.72	20.6	81.8	19.63	1452.0	7.35	129	598	37.31
enhagen	5	1630.0	2.19	19.7	79.8	21.24	1380.0	7.64	154	523	32.53

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22	Cairo	23	3542.0	0.16	32.0	70.7	91.74	NaN	4.15	323	250	
11	Beijing	12	2671.0	0.26	6.2	75.4	85.43	NaN	5.12	223	261	
16	Jakarta	17	2983.0	0.21	6.9	68.5	84.39	NaN	5.28	114	833	
25	Mumbai	26	2584.0	0.15	3.9	67.3	82.84	NaN	3.57	187	1183	
43	Mexico City	44	2555.0	0.45	28.9	76.4	82.78	2137.0	6.46	192	1313	

Cities with highest and lowest happiness levels

	City	Rank	Sunshine hours(City)	Cost of a bottle of water(City)	Obesity levels(Country)	Life expectancy(years) (Country)	Pollution(Index score) (City)	Annual avg. hours worked	Happiness levels(Country)	Outdoor activities(City)	Number of take out places(City)	Cost o membe
25	Mumbai	26	2584.0	0.15	3.9	67.3	82.84	NaN	3.57	187	1183	
22	Cairo	23	3542.0	0.16	32.0	70.7	91.74	NaN	4.15	323	250	
38	Johannesburg	39	3124.0	0.59	28.3	56.3	61.83	NaN	4.81	194	492	
11	Beijing	12	2671.0	0.26	6.2	75.4	85.43	NaN	5.12	223	261	
31	Shanghai	32	1776.0	0.29	6.2	75.4	77.40	NaN	5.12	108	346	

	City	Rank	Sunshine hours(City)	Cost of a bottle of water(City)	Obesity levels(Country)	Life expectancy(years) (Country)	Pollution(Index score) (City)	Annual avg. hours worked	Happiness levels(Country)	Outdoor activities(City)	Number of take out places(City)	Cost of member
5	Helsinki	6	1662.0	1.60	22.2	80.4	13.08	1540.0	7.80	113	309	
4	Copenhagen	5	1630.0	2.19	19.7	79.8	21.24	1380.0	7.64	154	523	
36	Zurich	37	1566.0	3.20	19.5	82.6	17.31	1557.0	7.56	69	538	
19	Geneva	20	NaN	2.62	19.5	82.6	27.25	1557.0	7.56	44	444	
0	Amsterdam	1	1858.0	1.92	20.4	81.2	30.93	1434.0	7.44	422	1048	

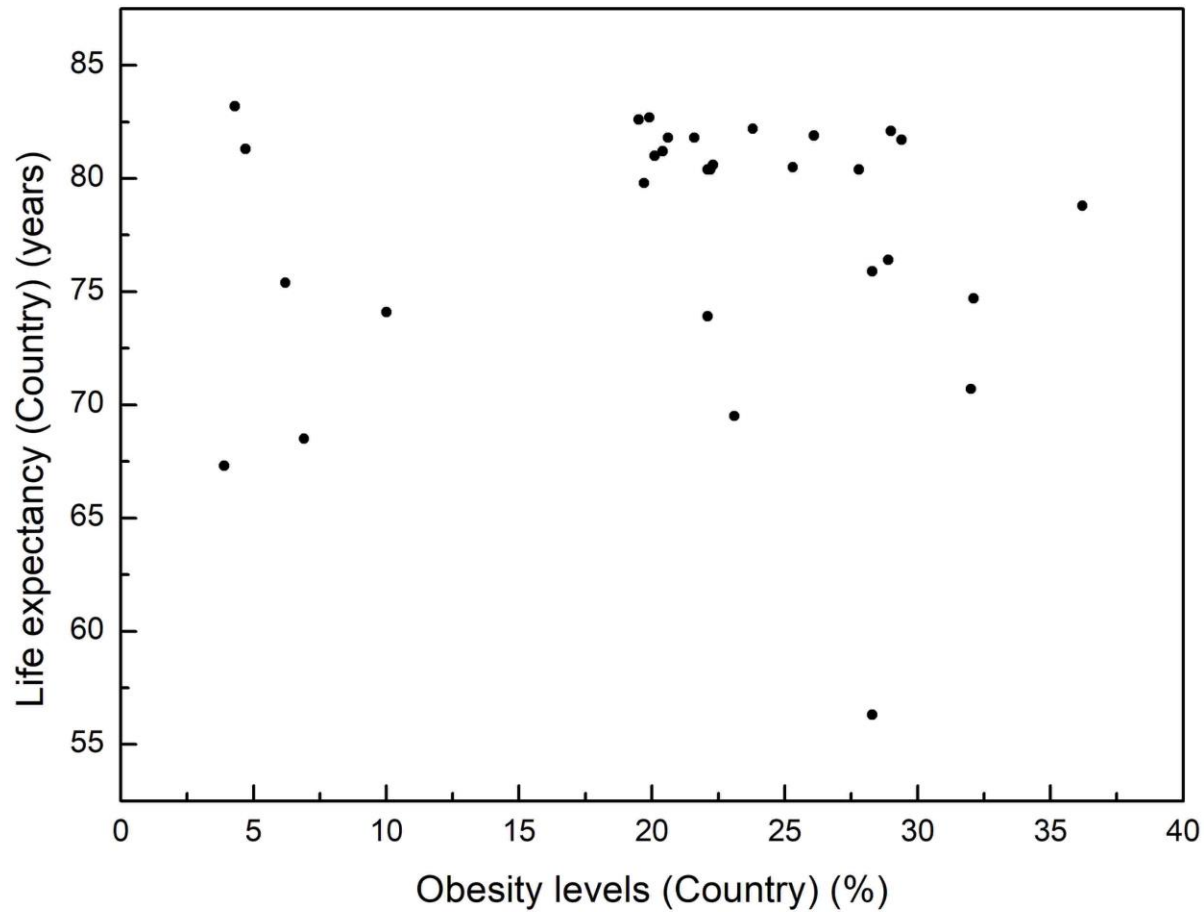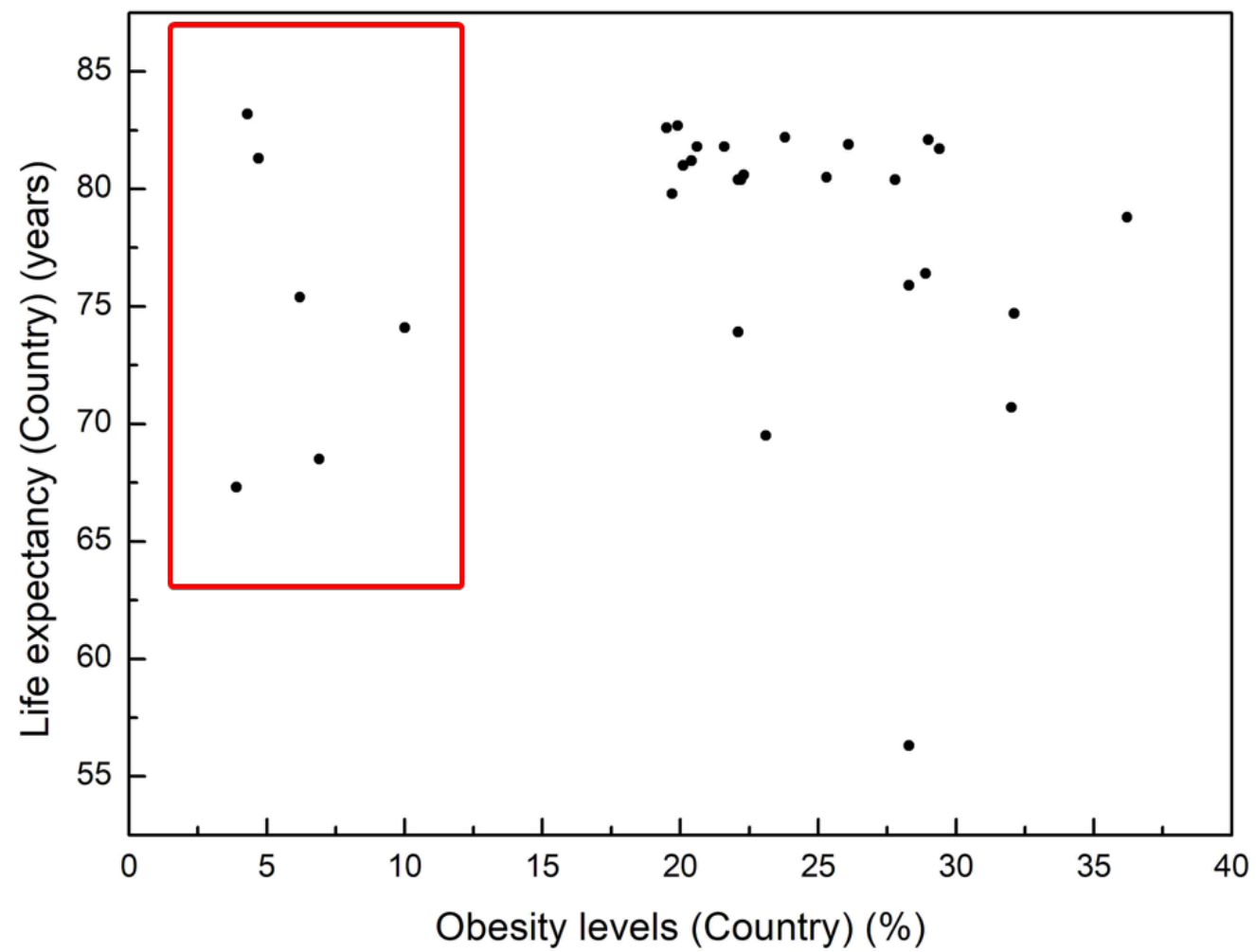# Any correlation of happiness with sunny days?

Behavior of difference between classes with respect to standard of life (development of the country)
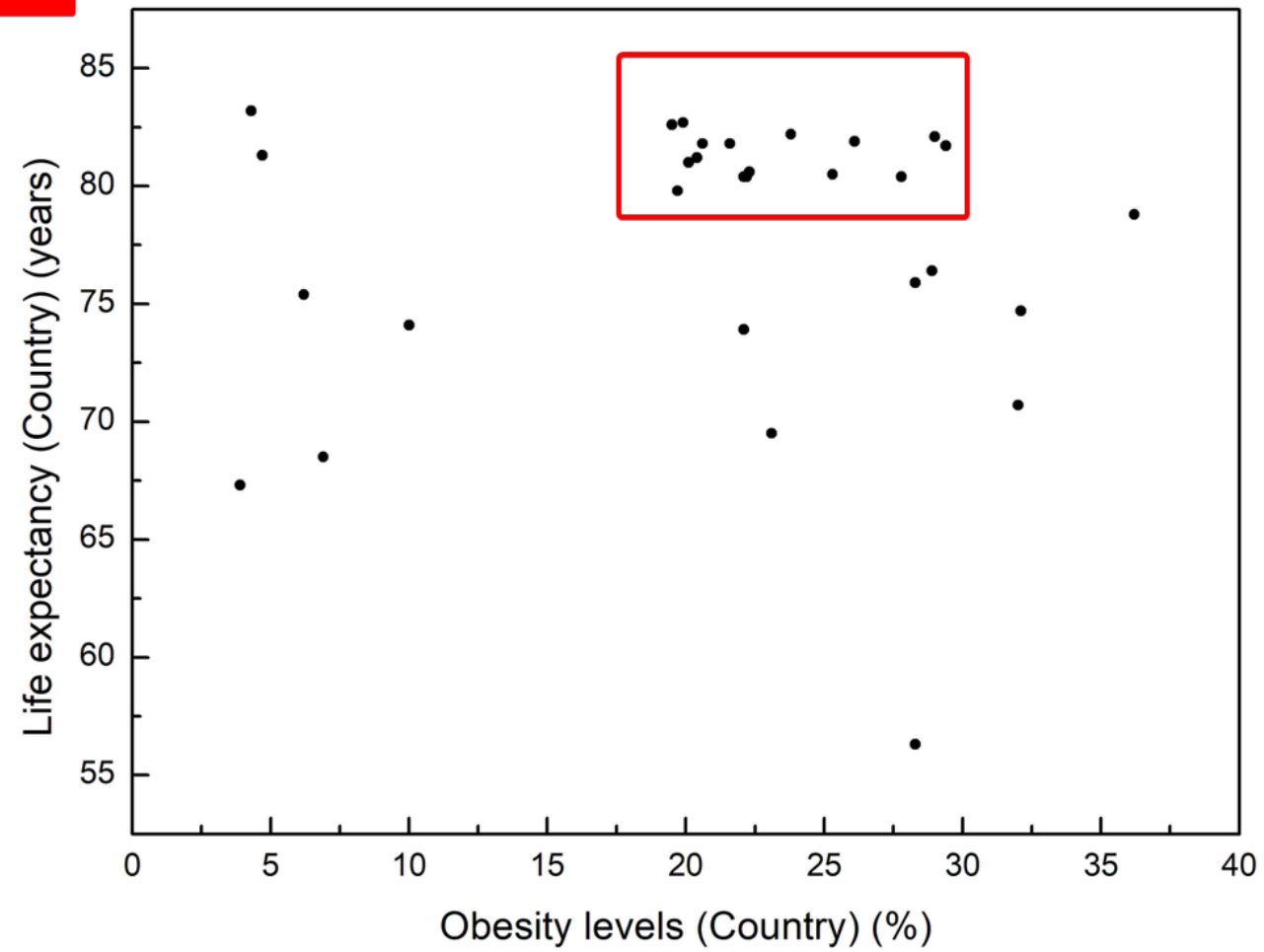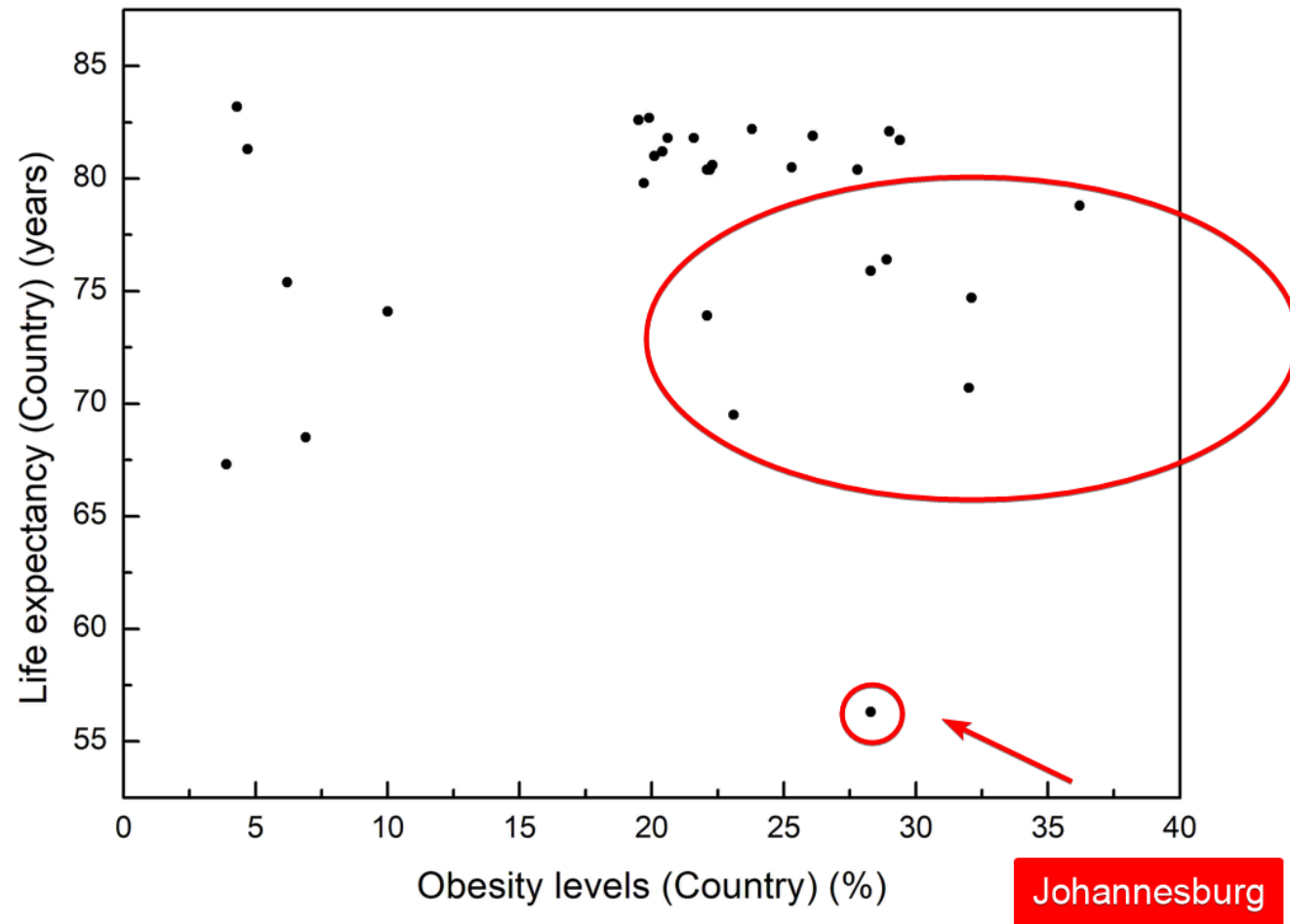
How does obesity – lifespan relationship looks like?

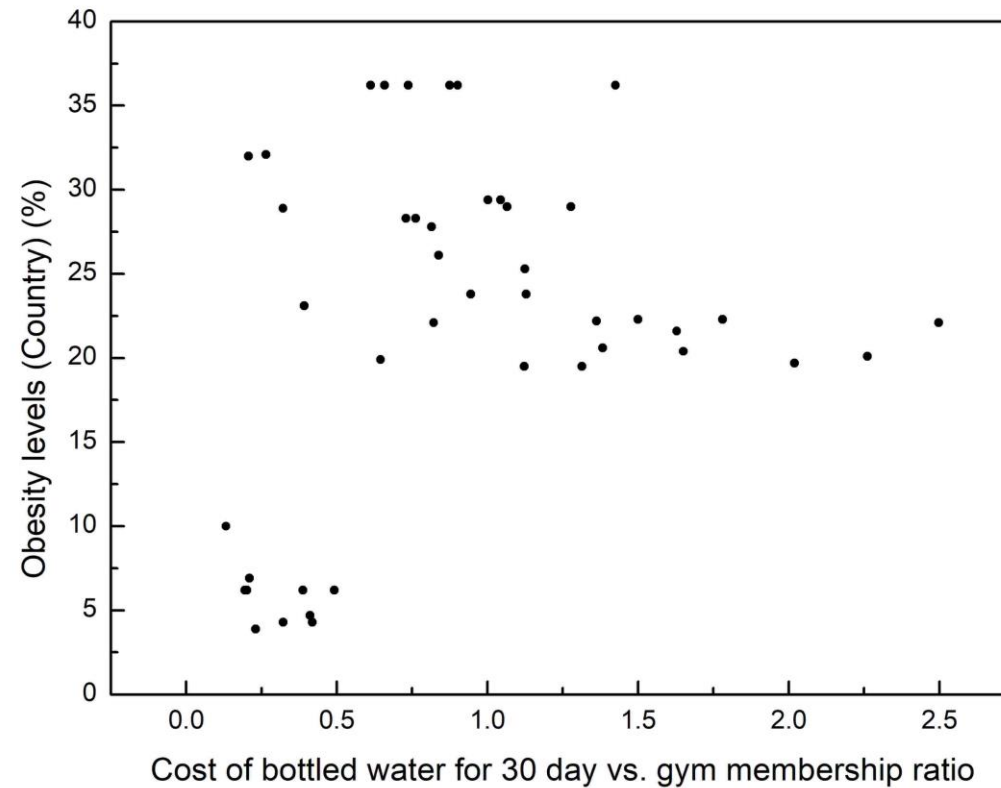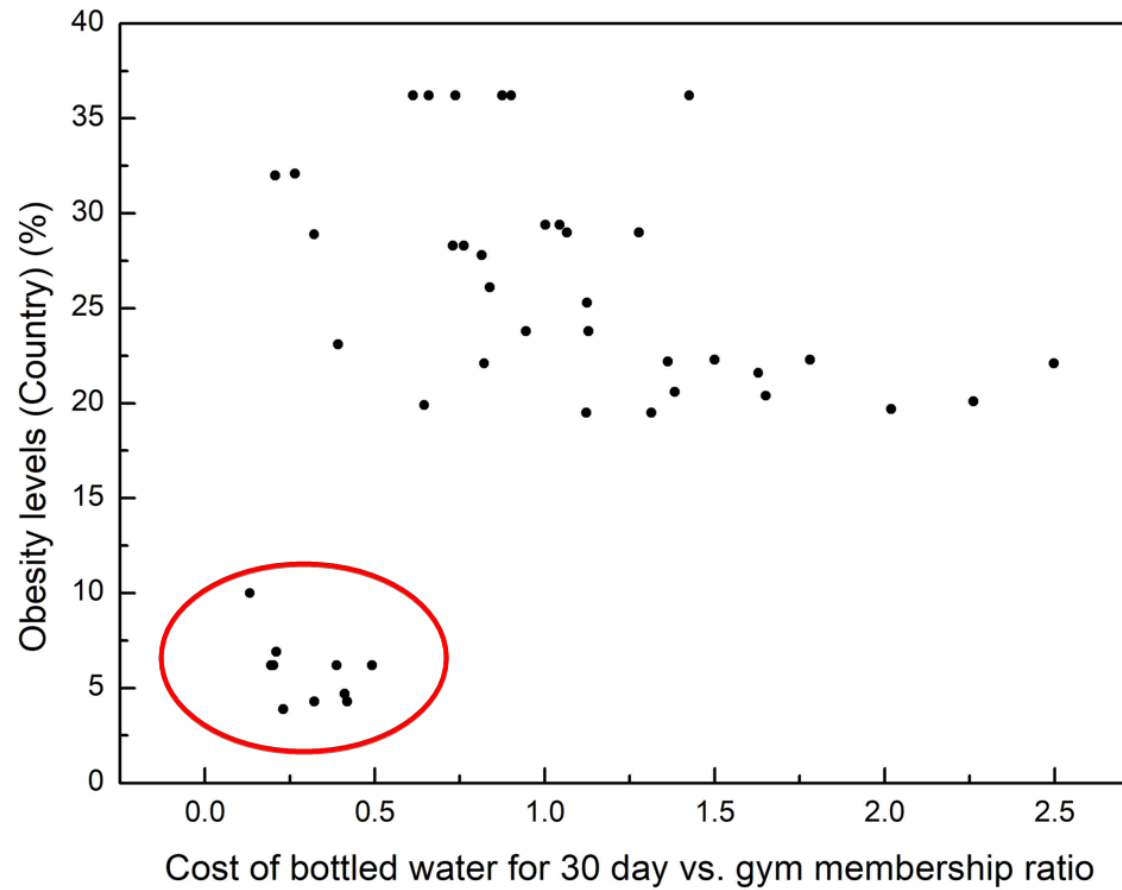# Left side of the graph holds 22.70% of cities

22.72%

	City	Rank	Sunshine hours(City)	Cost of a bottle of water(City)	Obesity levels(Country)	Life expectancy(years) (Country)	Pollution(Index score) (City)	Annual avg. hours worked	Happiness levels(Country)	Outdoor activities(City)	Number of take out places(City)	Cost of a m membershi
6	Fukuoka	7	2769.0	0.78	4.3	83.2	NaN	1644.0	5.87	35	539	
28	Tokyo	29	1877.0	0.76	4.3	83.2	42.84	1644.0	5.87	387	5802	
17	Seoul	18	2066.0	0.59	4.7	81.3	57.82	1967.0	5.87	144	389	
11	Beijing	12	2671.0	0.26	6.2	75.4	85.43	NaN	5.12	223	261	
23	Taipei	24	1405.0	0.57	6.2	75.4	49.32	NaN	5.12	134	717	
30	Hong Kong	31	1836.0	0.75	6.2	75.4	67.46	NaN	5.51	277	1257	
31	Shanghai	32	1776.0	0.29	6.2	75.4	77.40	NaN	5.12	108	346	
12	Bangkok	13	2624.0	0.22	10.0	74.1	76.64	NaN	5.99	377	1796	
16	Jakarta	17	2983.0	0.21	6.9	68.5	84.39	NaN	5.28	114	833	
25	Mumbai	26	2584.0	0.15	3.9	67.3	82.84	NaN	3.57	187	1183	

15.90%

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43	Mexico City	44	2555.0	0.45	28.9	76.4	82.78	2137.0	6.46	192	1313	
13	Buenos Aires	14	2525.0	0.57	28.3	75.9	52.64	NaN	5.97	246	1435	
21	Istanbul	22	2218.0	0.15	32.1	74.7	69.49	1832.0	5.13	419	934	
35	Sao Paulo	36	2003.0	0.44	22.1	73.9	79.78	NaN	6.37	158	3355	
22	Cairo	23	3542.0	0.16	32.0	70.7	91.74	NaN	4.15	323	250	
42	Moscow	43	1901.0	0.41	23.1	69.5	57.63	1965.0	5.54	322	3206	
38	Johannesburg	39	3124.0	0.59	28.3	56.3	61.83	NaN	4.81	194	492	

Let's now see relationship between obesity levels and life standard that is now expressed as ratio between cost of monthly gym membership and 30 days of water (buying one per day).

Filtering out

Bottom left corner

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31	Shanghai	32	1776.0	0.29	6.2	75.4	77.40	NaN	5.12	108	346	

Fun fact: for some reason, countries that have the same obesity level have also the same annual avg. working hours, happiness level, life expectancy and around the same price of bottled water.
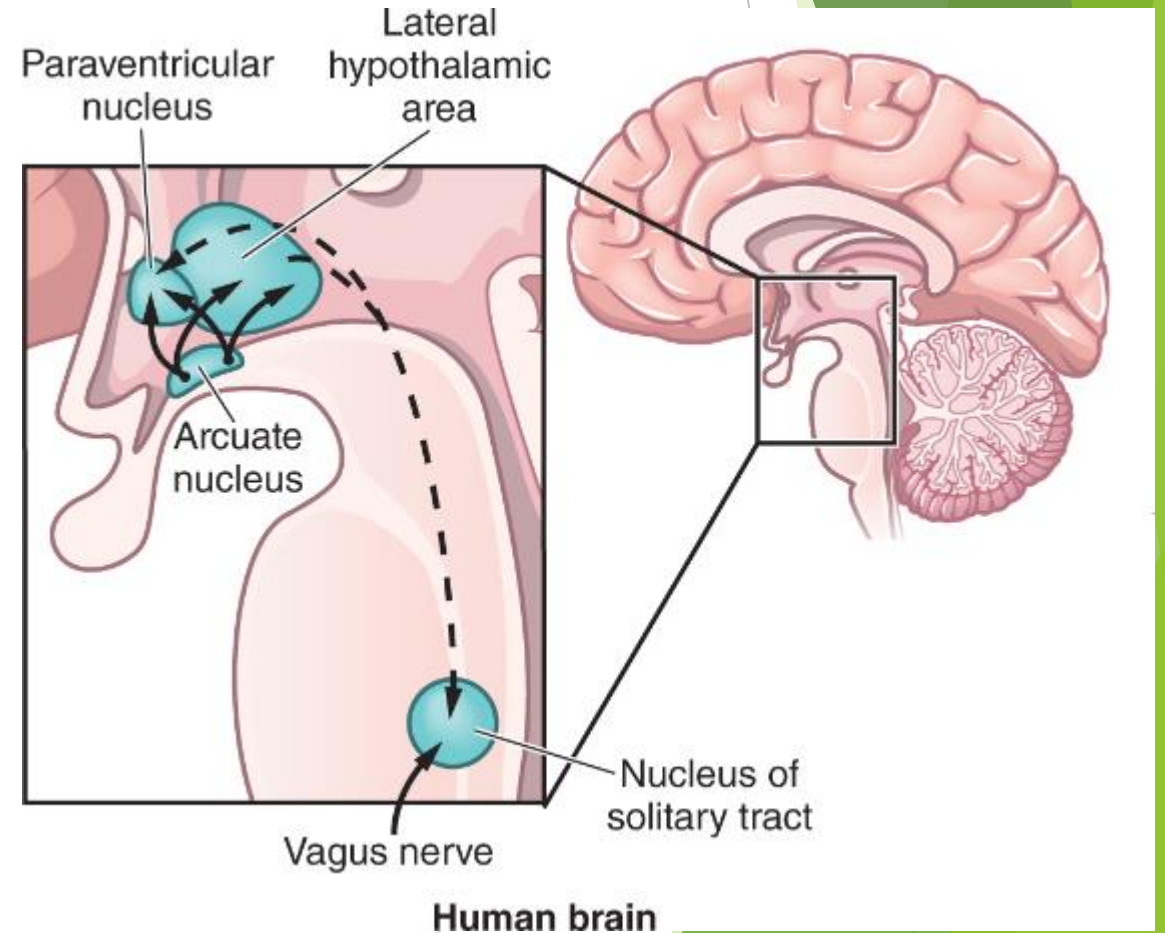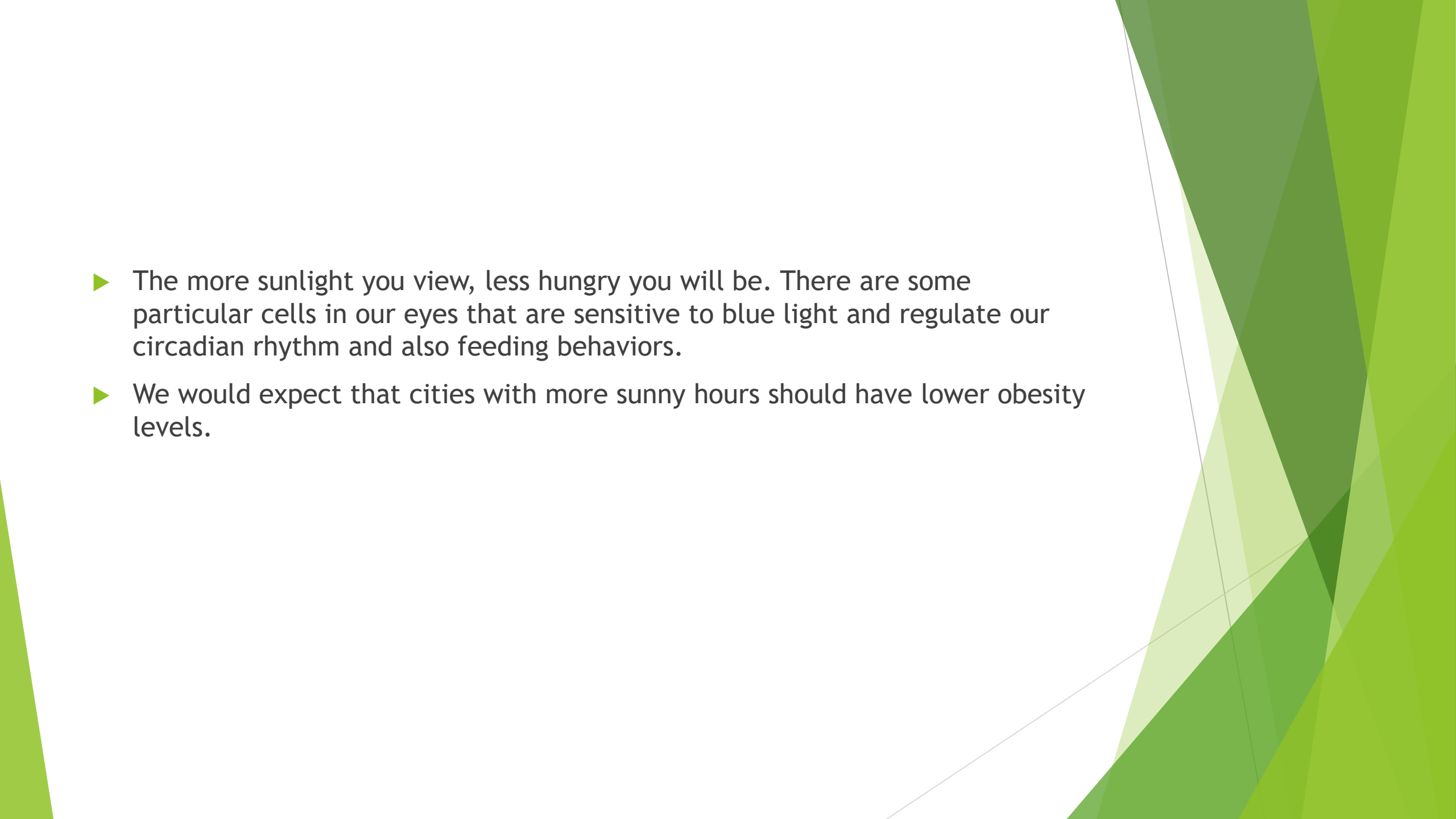
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24	Los Angeles	25	3254.0	1.52	36.2	78.8	66.07	1779.0	6.94	223	1439	
26	Boston	27	2634.0	1.39	36.2	78.8	27.03	1779.0	6.94	88	588	
29	Chicago	30	2508.0	1.20	36.2	78.8	43.33	1779.0	6.94	171	1320	
33	San Francisco	34	3062.0	1.60	36.2	78.8	47.36	1779.0	6.94	242	1031	
40	Washington, D.C.	41	2528.0	1.45	36.2	78.8	39.18	1779.0	6.94	83	744	
41	New York	42	2535.0	1.32	36.2	78.8	57.36	1779.0	6.94	359	3081	

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Arcuate nucleus of hypothalamus

▶ It is know that viewing light affects human feeding behavior. There is an aggregation of neurons in hypothalamus (arcuate nucleus of hypothalamus) that drives our feeding behavior and feelings of being safe. So, let's check out the relationship between obesity levels and sunshine hours.

Paraventricular nucleus

Lateral hypothalamic area

Arcuate nucleus

Vagus nerve

Nucleus of solitary tract

Human brain

- The more sunlight you view, less hungry you will be. There are some particular cells in our eyes that are sensitive to blue light and regulate our circadian rhythm and also feeding behaviors.

- We would expect that cities with more sunny hours should have lower obesity levels.

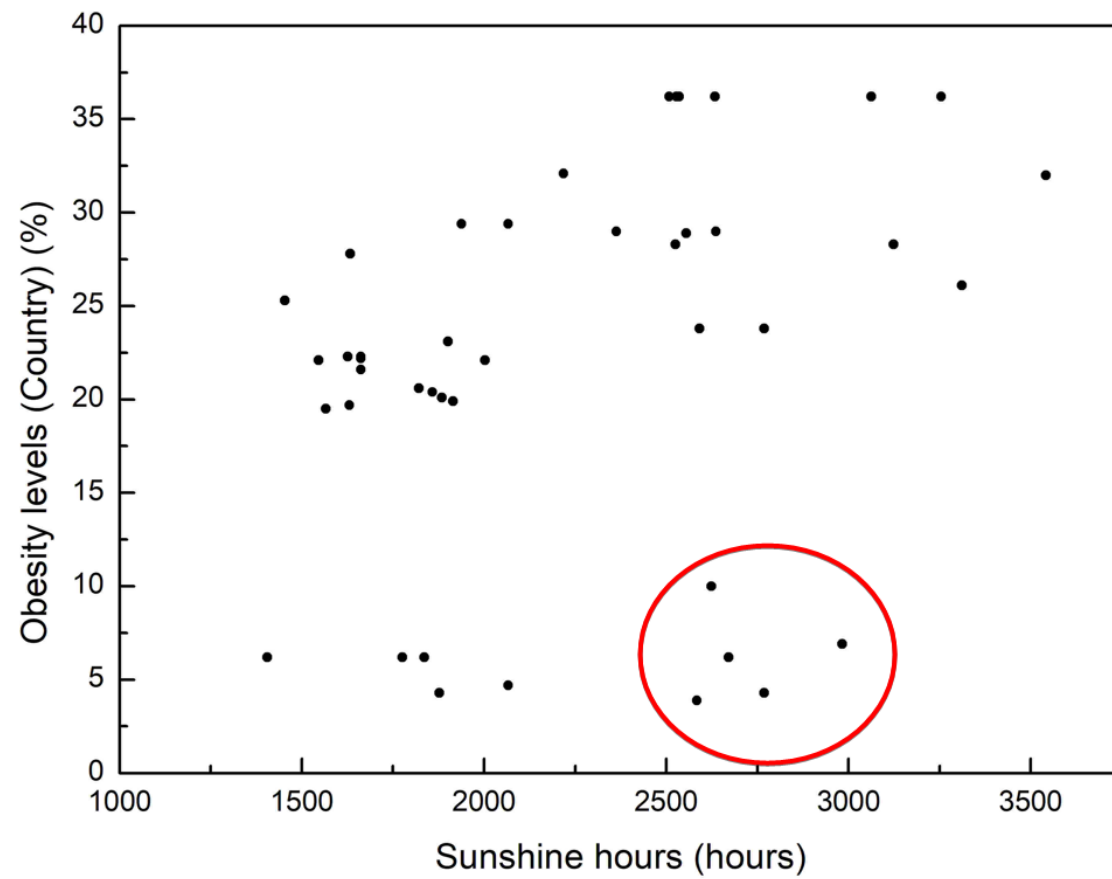# Obesity levels as a function of sunshine hours per year
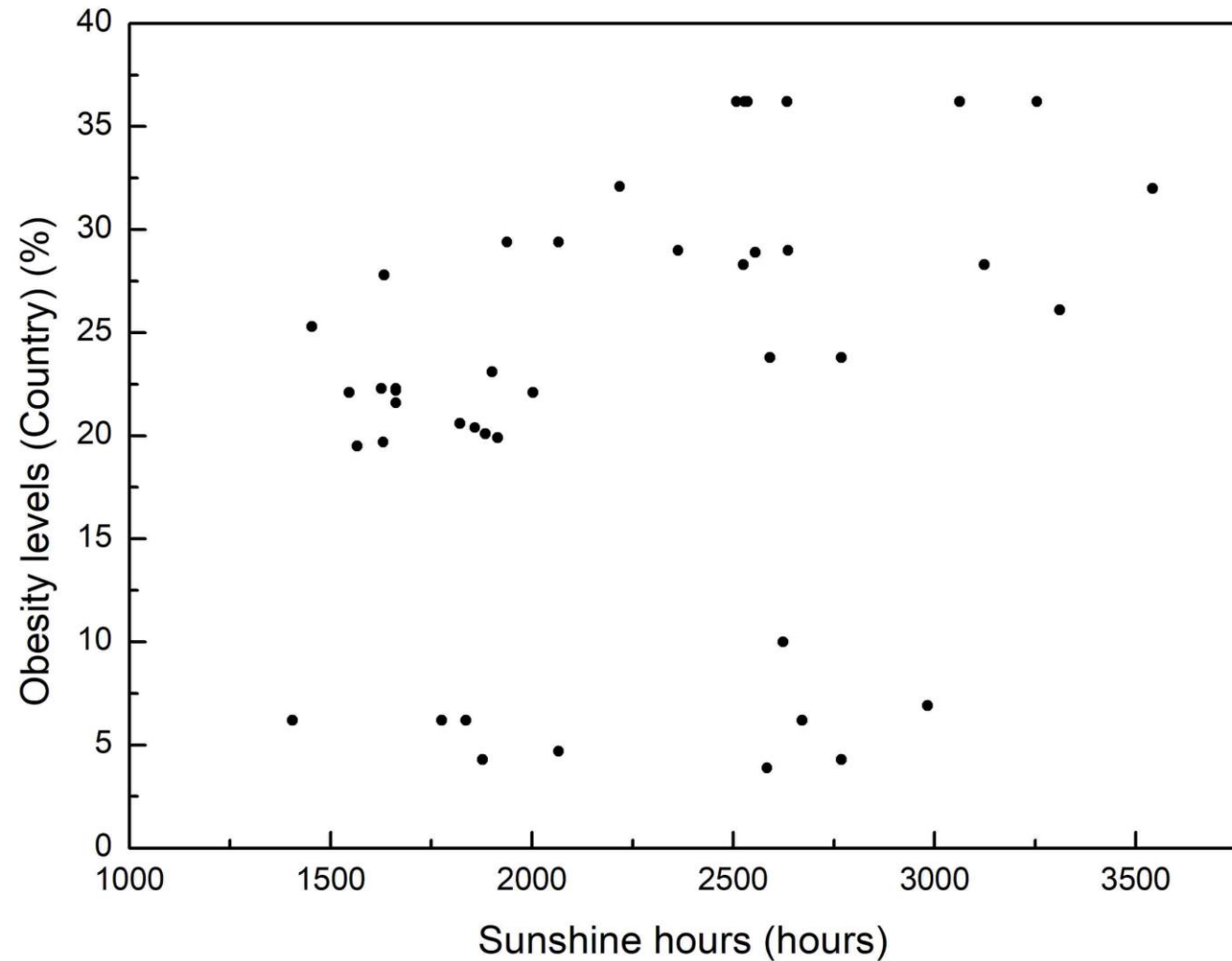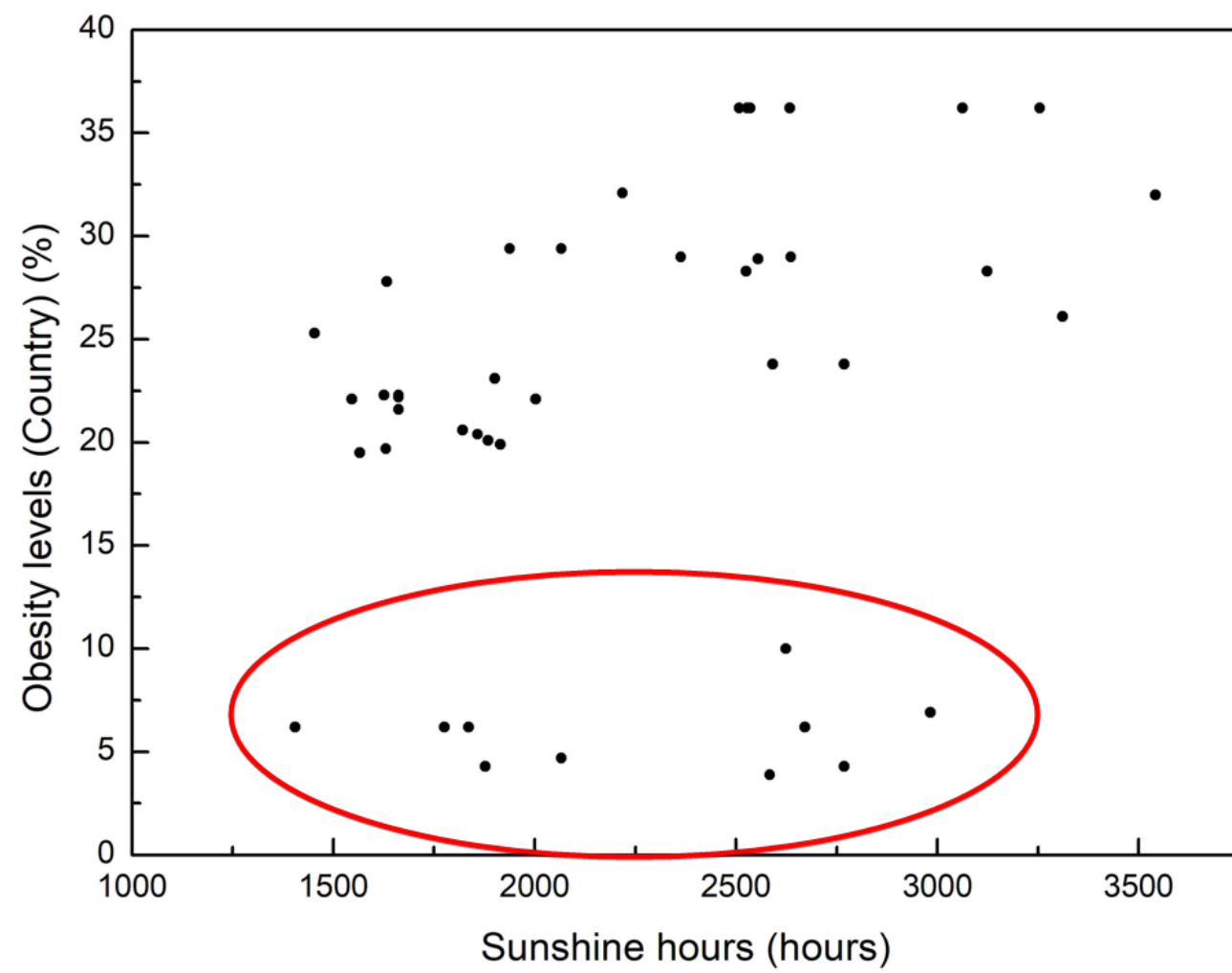
We would be expecting different result, so this came as a surprise. Let's see which cities lay at the bottom of the graph.

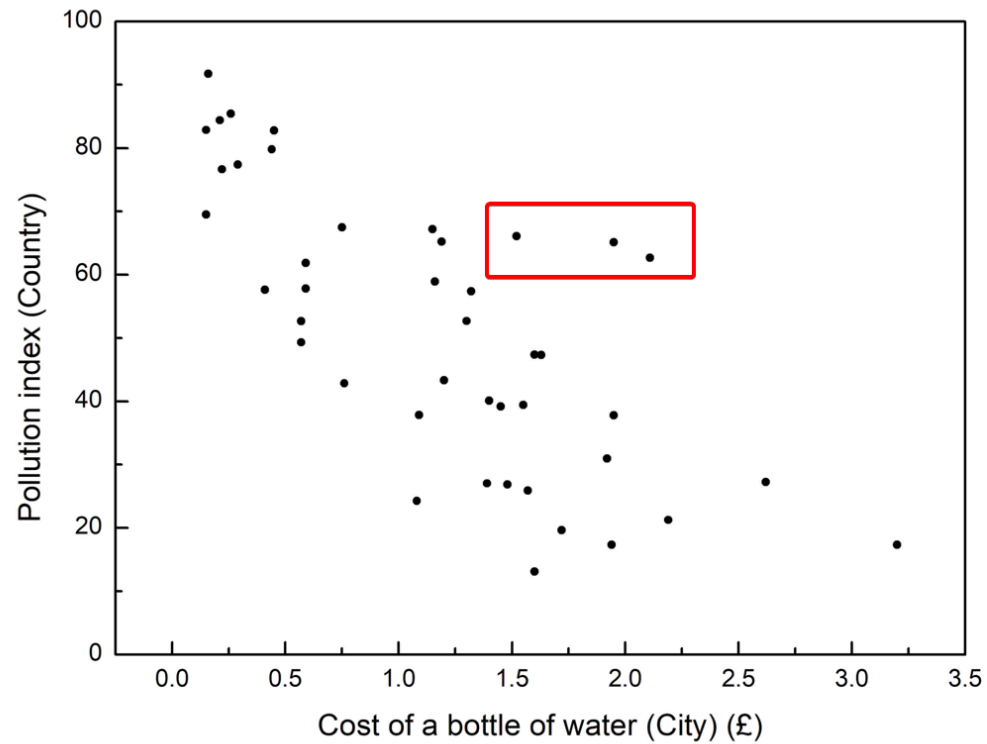|	City	Rank	Sunshine hours(City)	Cost of a bottle of water(City)	Obesity levels(Country)	Life expectancy(years) (Country)	Pollution(Index score) (City)	Annual avg. hours worked	Happiness levels(Country)	Outdoor activities(City)	Number of take out places(City)	Cost of a m membershi
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Pollution and life expectancy
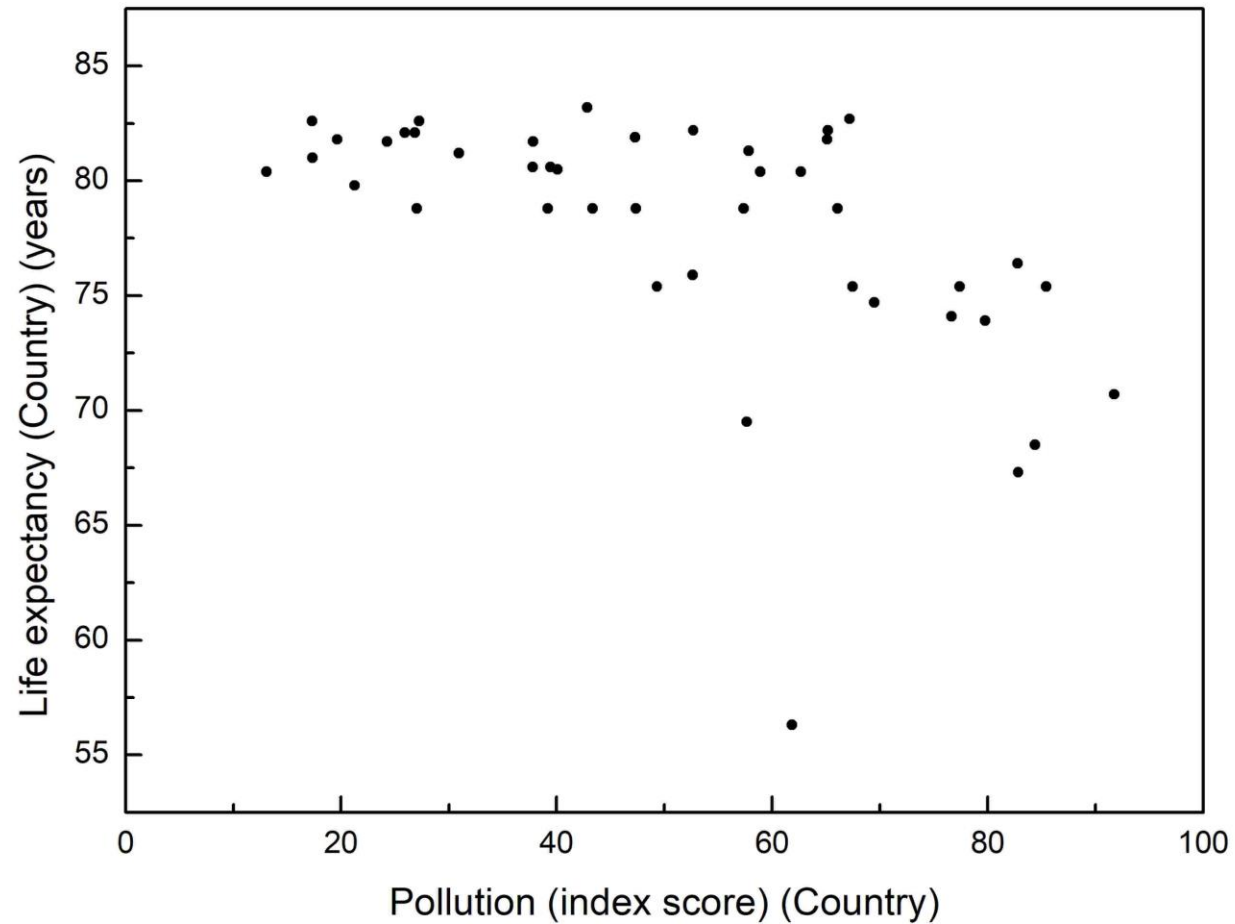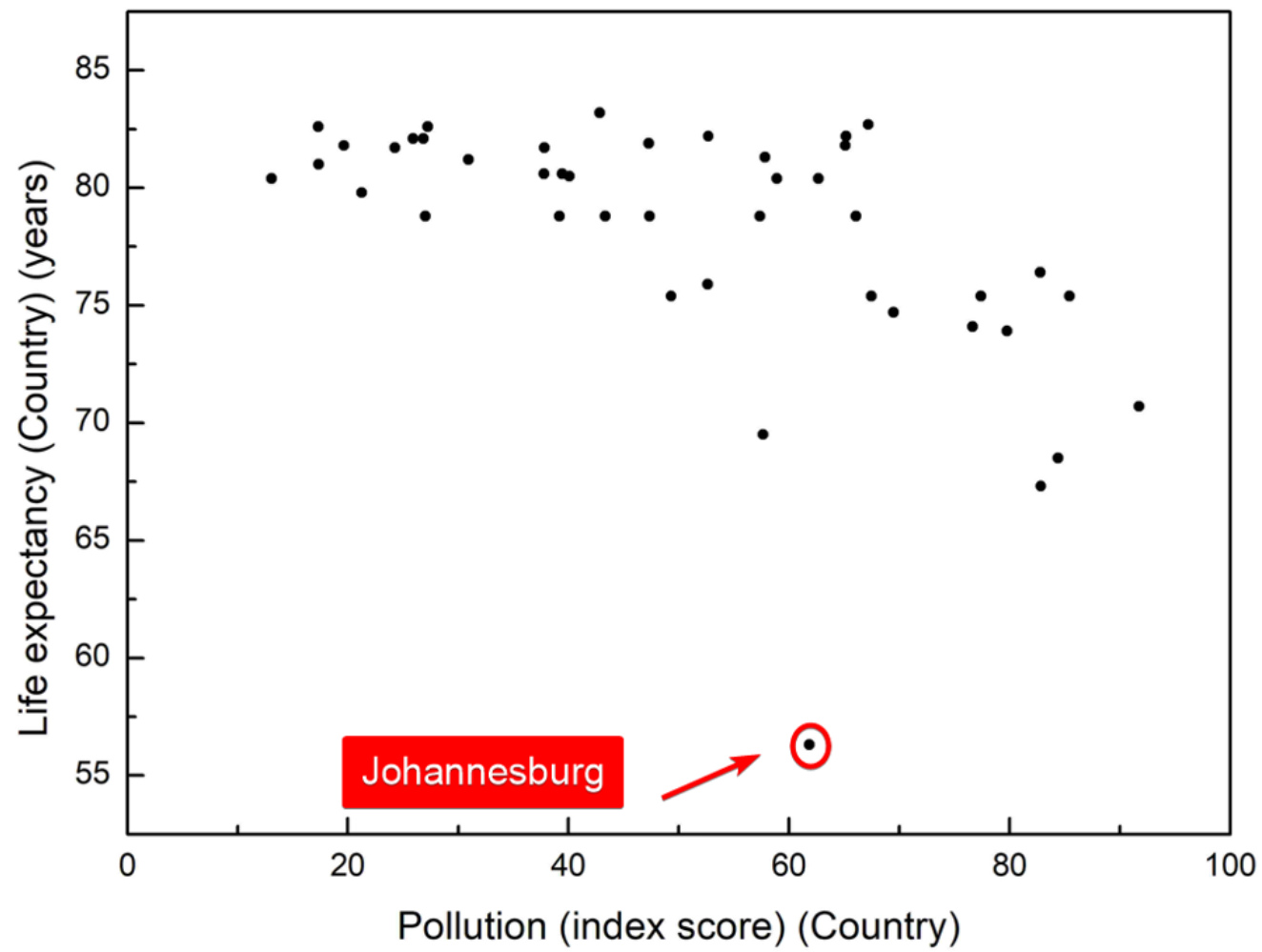
Assumption: the more expensive bottled water the better the standard of life, i.e. more developed country.
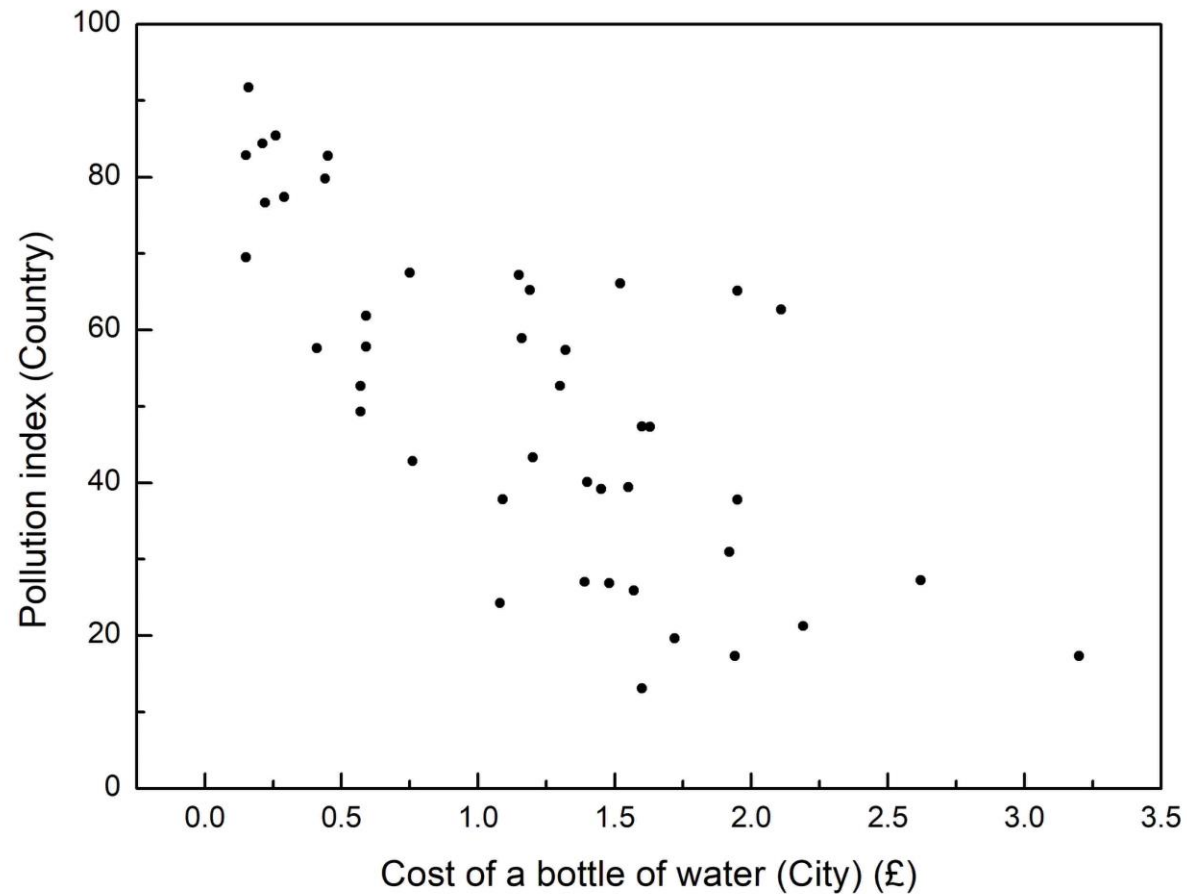
Conclusion: the better standard of life the less polluted the country. (Or maybe, more developed countries move their companies to countries that are less developed and will work for less money - cheap labor and thus countries with lower life standards are more polluted)

Points that somewhat deviate from previous graph:

	City	Rank	Sunshine hours(City)	Cost of a bottle of water(City)	Obesity levels(Country)	Life expectancy(years) (Country)	Pollution(Index score) (City)	Annual avg. hours worked	Happiness levels(Country)	Outdoor activities(City)	Number of take out places(City)	Cost of a m membership
24	Los Angeles	25	3254.0	1.52	36.2	78.8	66.07	1779.0	6.94	223	1439	
32	Brussels	33	1546.0	2.11	22.1	80.4	62.67	1583.0	6.86	55	988	
34	Paris	35	1662.0	1.95	21.6	81.8	65.10	1505.0	6.66	331	4363	

Amsterdam is ranked as #1 to live in.

- #11 least polluted city
- #16 by life expectancy
- #5 happiest city
- #3 by the number of outdoor activities

► Trying to find equation for ranking the cities?

- Thank you for your time!