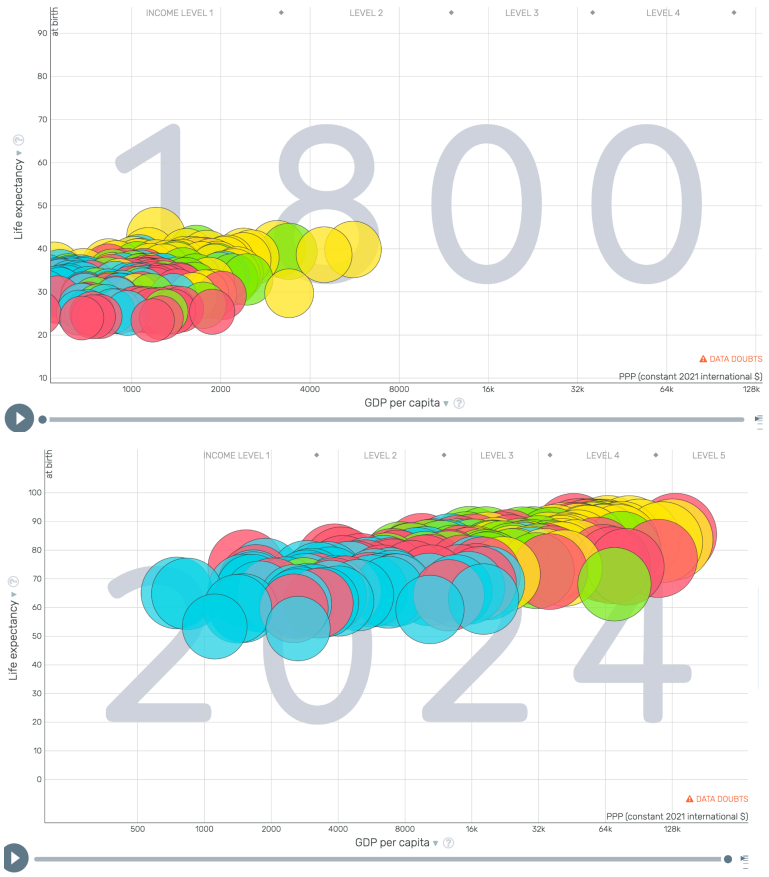
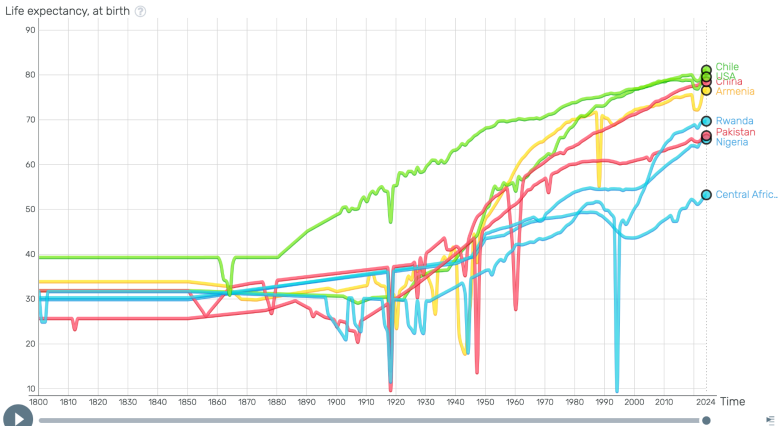
Beverly Mutuku and Sebastian Lange

Are there regional differences in life expectancy? How do these differences shift over time?

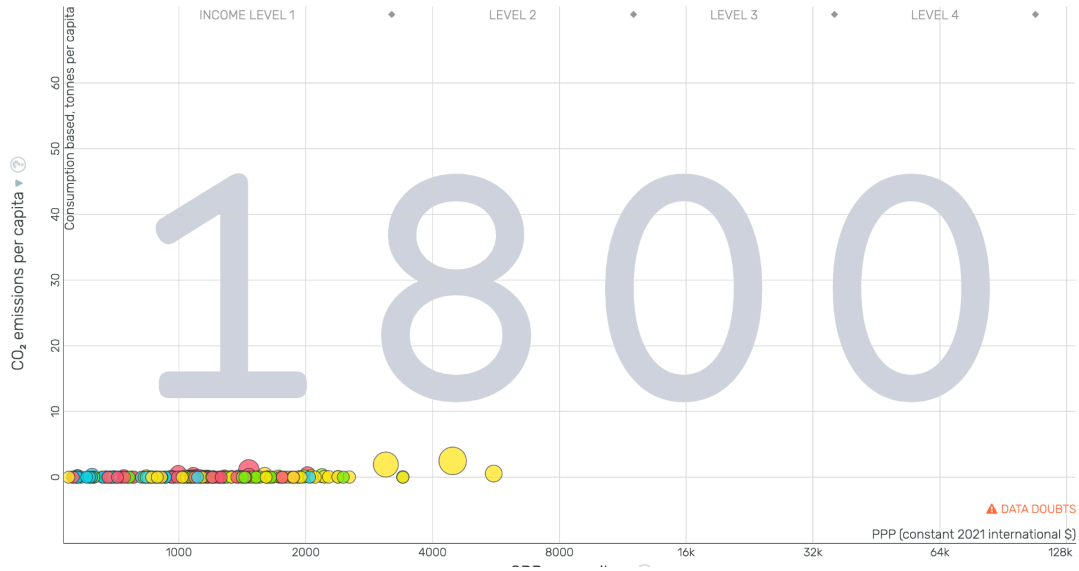
Yes, life expectancy differs by region. Europe and the Americas tend to have the highest life expectancy, while Asia (including Oceania) is generally next but with much more variability across countries. Asia has risen a lot over the last century, and Africa is typically the lowest. Over time, life expectancy increases in every region, so the whole distribution shifts upward. The gaps also shift: regions move up in different speeds, so the distance between the highest- and lowest-life-expectancy areas changes over time. For example, the gap between the Central African Republic and the USA has grown larger with time. Overall, the world has mostly converged upward since 1800, but noticeable regional gaps in life expectancy remain today.

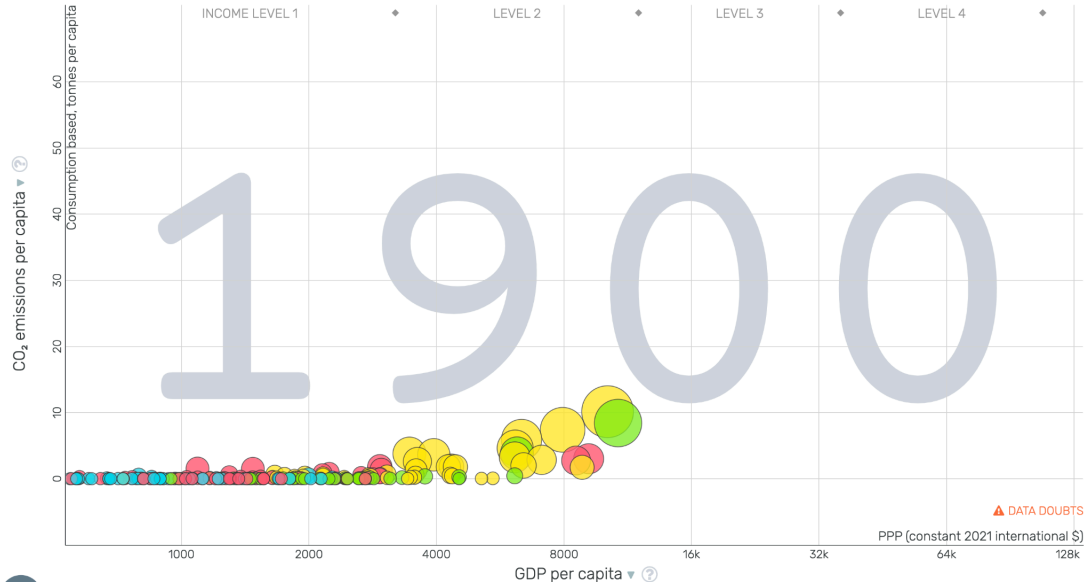


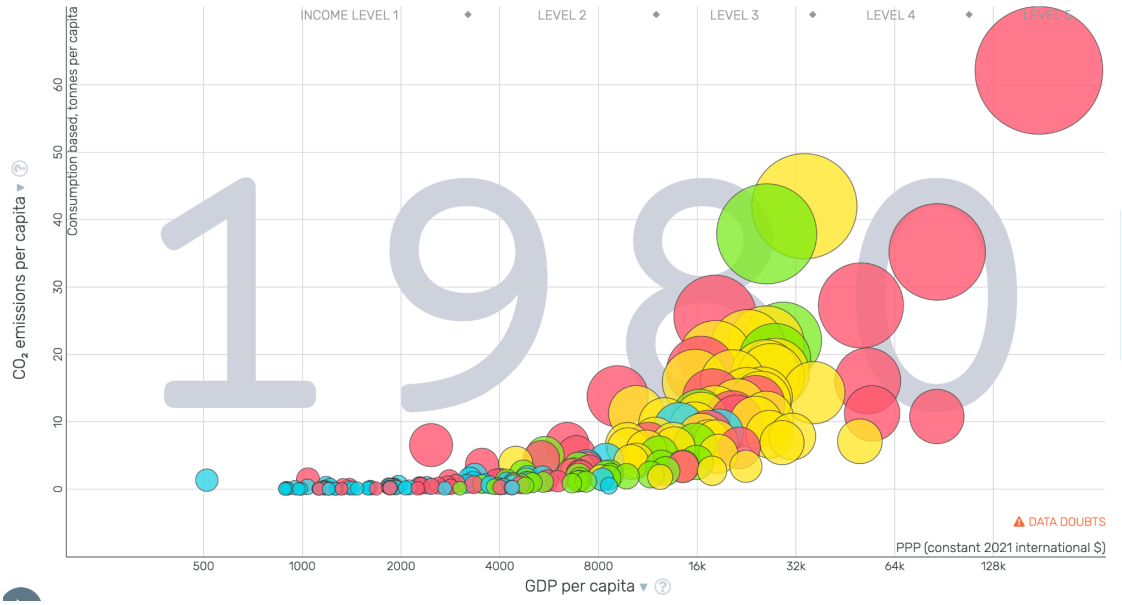


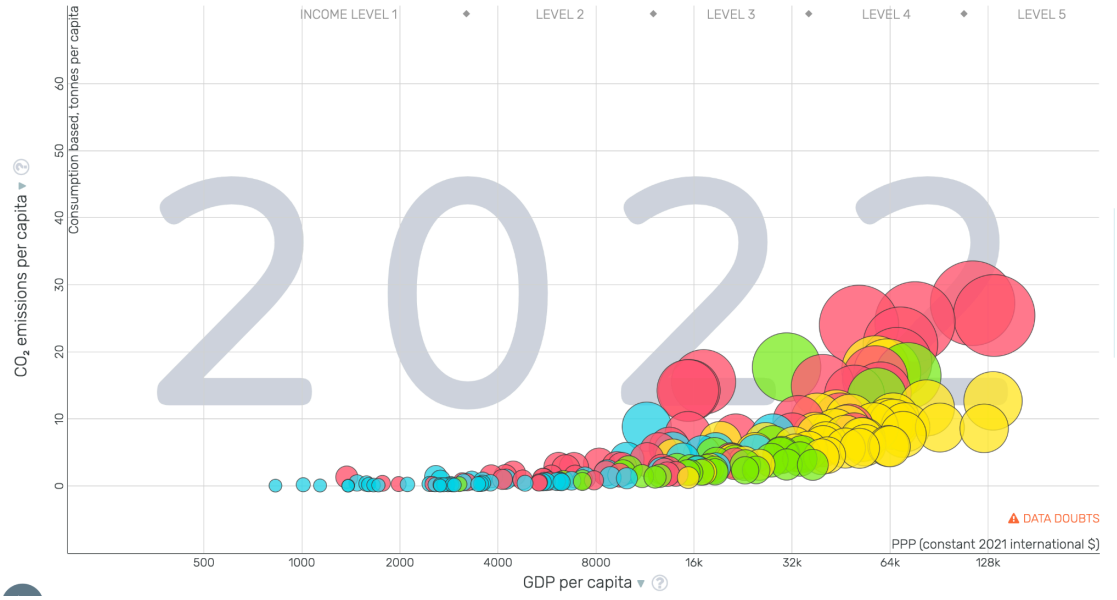
How is GDP associated with CO2 emissions? Are there shifts over time?

GDP per capita and CO2 emissions per capita are positively correlated. At the start (1800), no nations, besides the main powers of the time (UK, NED, USA), had noticeable CO2 emissions per capita. Most countries cluster at low GDP per capita and near-zero CO2 emissions per capita, so there isn't much spread. Over the next hundred years, those powers grew more in terms of GDP per capita and also started to increase CO2 emissions per capita, though most countries shifted further up the GDP per capita scale. In 1980, an exponential relationship between GDP per capita and CO2 emissions per capita was obvious, indicating rapid growth for early risers. With the rise in fossil fuels, Middle Eastern nations like Qatar, Kuwait, and the UAE show the largest CO2 emissions per capita and GDP per capita. Here, the spread is the widest. By 2022, the positive relationship still holds, but the spread decreases somewhat. Many countries are in the mid-to-high GDP per capita range with moderate CO2 emissions per capita, while a smaller group of very high-GDP per capita countries has especially high CO2 per capita. Overall, the whole cloud shifts rightward and upward, showing economic growth alongside higher emissions.




INCOME LEVEL 1
LEVEL 2
LEVEL 3
LEVEL 4
1900
CO₂ emissions per capita
Consumption based, tonnes per capita
0
10
20
30
40
50
60
DATA DOUBTS
PPP (constant 2021 international $)
1000
2000
4000
8000
16k
32k
64k
128k
GDP per capita


INCOME LEVEL 1
LEVEL 2
LEVEL 3
LEVEL 4
LEVEL 5
1980
CO₂ emissions per capita
Consumption based, tonnes per capita
0
10
20
30
40
50
60
DATA DOUBTS
PPP (constant 2021 international $)
500
1000
2000
4000
8000
16k
32k
64k
128k
GDP per capita


INCOME LEVEL 1
LEVEL 2
LEVEL 3
LEVEL 4
LEVEL 5
2023
CO_2 emissions per capita
Consumption based, tonnes per capita
0
10
20
30
40
50
60
DATA DOUBTS
PPP (constant 2021 international $)
500
1000
2000
4000
8000
16k
32k
64k
128k
GDP per capita