

Practical Task 1

1. The following bar graph shows the gender wage gap in 26 countries based on data collected by the [OECD](#). The gender wage gap is calculated by finding the difference between male and female median wages and dividing it by male median wages. It is represented as a percentage in this graph.

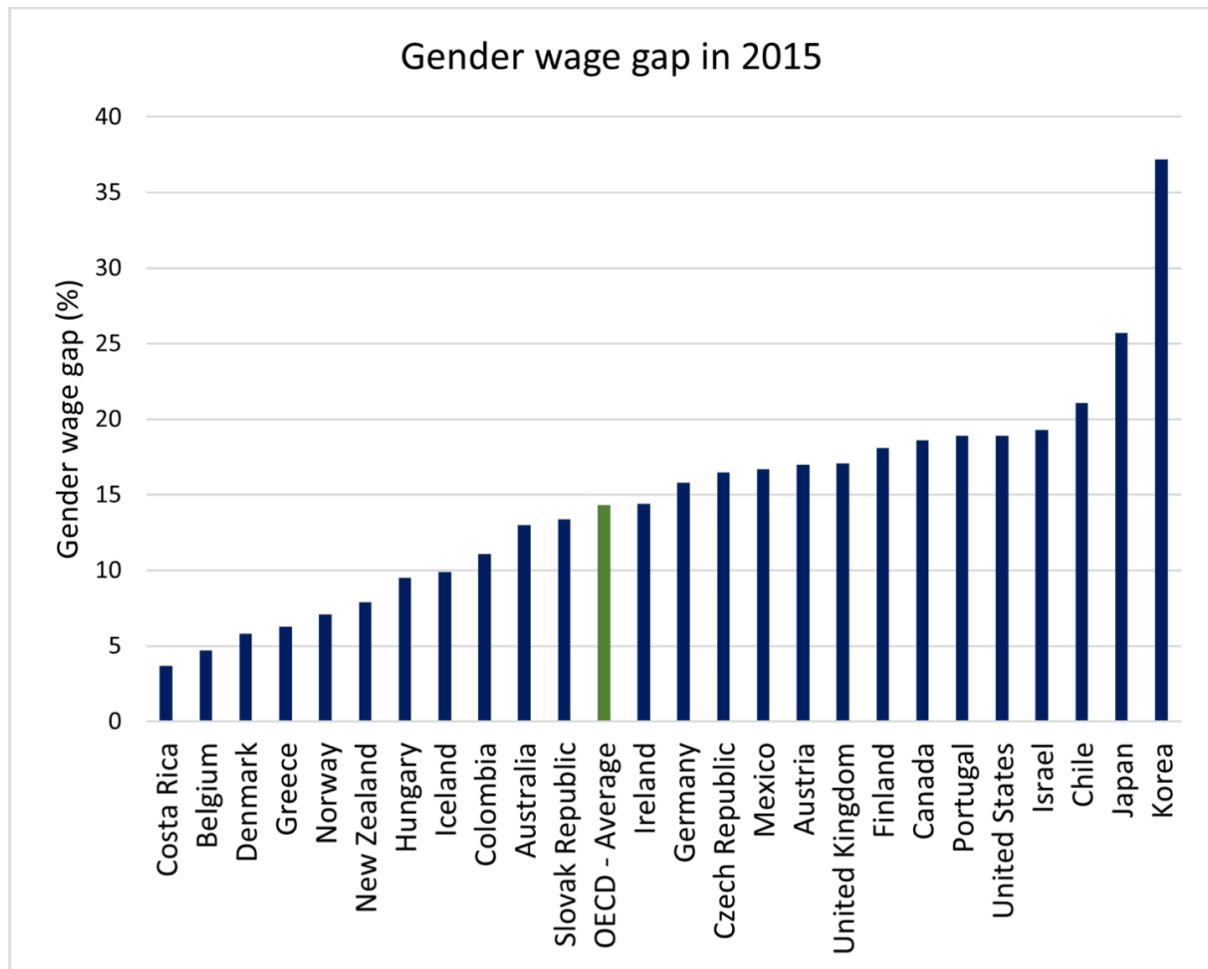


Figure 1: Gender wage gap in 2015 ([Source](#))

- Which three countries have the lowest gender wage gap?

Costa Rica, Belgium and Denmark.

- Which three countries have the highest gender wage gap?

Korea, Japan and Chile.

- Do some research on the country with the lowest gender wage gap and comment on why you think it succeeded in achieving a low gender wage gap in 2015 (max. 150 words).

Laura Chinchilla Miranda served as the President of Costa Rica from 2010 to 2014, making history as the first woman to hold the highest office in the country. During her tenure she did make efforts to address certain aspects related to women and social issues.

Chinchilla advocated for the empowerment of women in Costa Rica and emphasised the importance of women's participation in all aspects of society.

She supported initiatives to increase women's representation in political and leadership roles (near doubling of women in ministerial positions by 2015, from 25% to 41%).

Chinchilla's administration implemented social programs aimed at improving living conditions for vulnerable populations, including women and children. The government worked on improving access to education and healthcare, which has a direct impact on the well-being of women and families.

That is why Costa Rica succeeded in achieving a low gender wage gap in 2015.

2. The following line graph shows the sale of isopropanol from May 2019 to March 2020 in the United States of America. The sales are measured using US cents per weight (lb) of the product (US CTS/lb). Focus on the general trend of the three lines on the graph rather than what each of the lines refers to specifically when answering the questions.

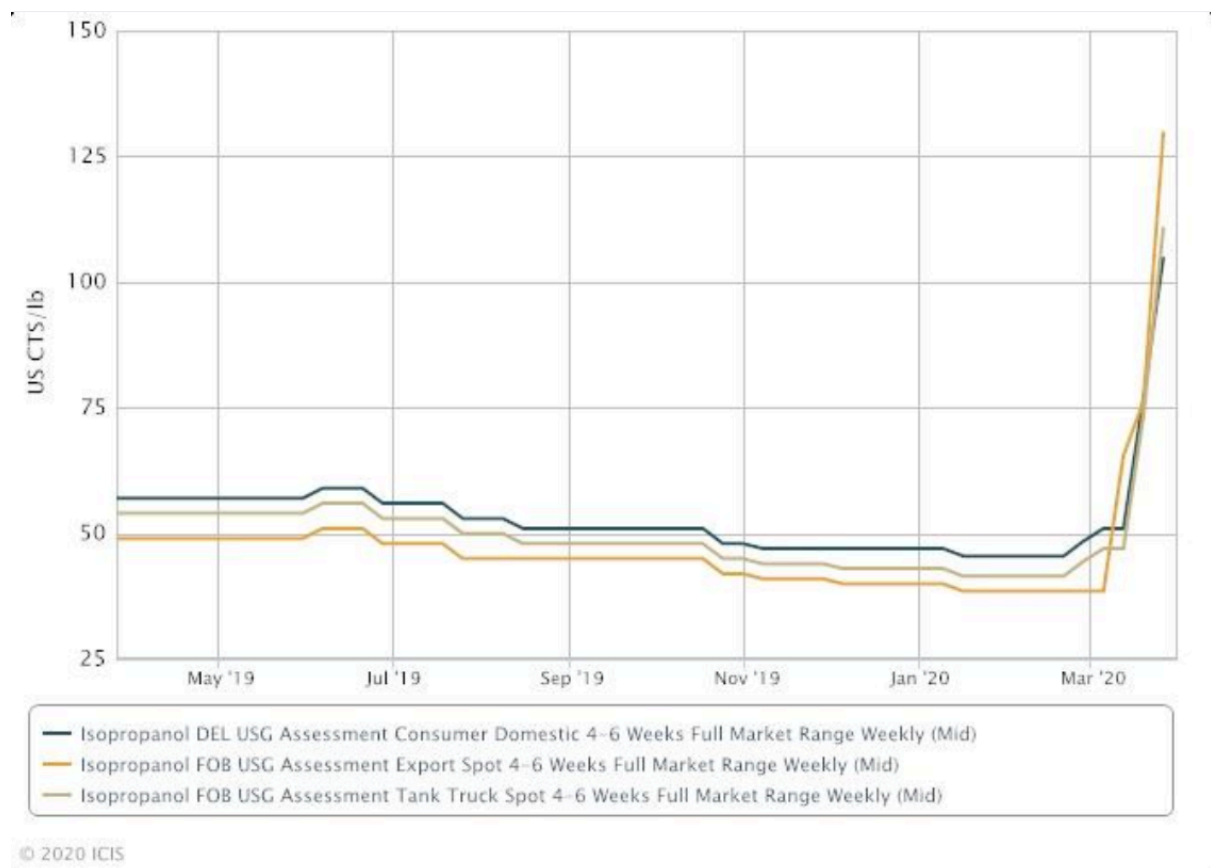


Figure 2: Isopropanol sales from May 2019 to March 2020 ([Source](#))

- Explain what is happening in the graph during March 2020 with regards to isopropanol sales (max. 100 words).

During March 2020, sales of isopropanol increased significantly.

- Describe a possible reason for the observation you made about isopropanol sales in March 2020 (max. 100 words). **Hint:** Isopropanol is the main ingredient in hand sanitiser.

Isopropanol is used in many hand sanitizers, which are in high demand among consumers because of their ability to kill germs. Isopropanol sales have increased since March 2020 due to strong demand for hand sanitizers during the coronavirus (Covid-19) outbreak.

3. Below, the bubble plot (a scatter plot with variable dot size) shows carbon dioxide (CO₂) emissions per person in tonnes vs the gross domestic product (GDP) per capita (average per person). No unit is given for the GDP per capita; however, the US dollar is typically used when comparing different countries (Callen, n.d.). Each dot represents a country. The colours of the dots refer to the continent to which the country belongs. The size of the dot refers to the size of the population in the country. The larger the dot, the larger the population.

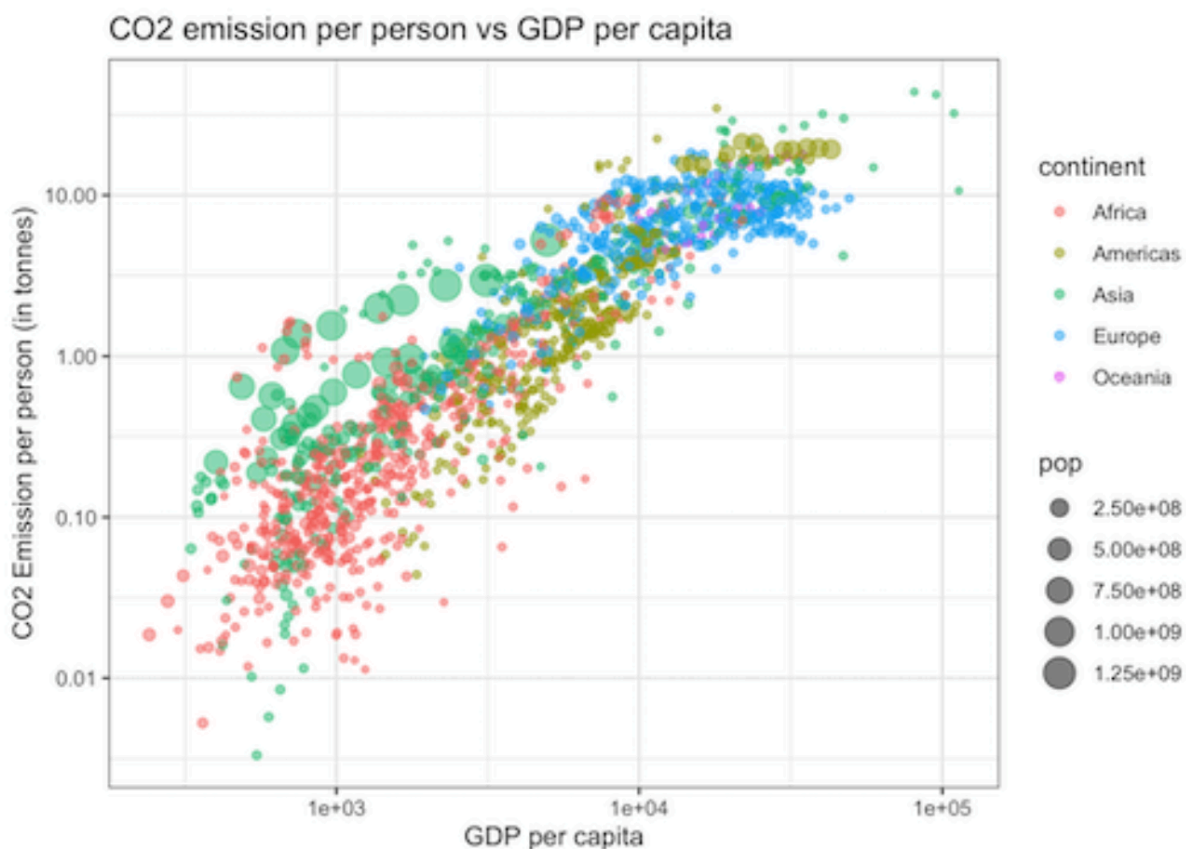


Figure 3: CO2 emissions per person vs GDP per capita

- Discuss the relationship between CO2 emissions per person and GDP per capita for each continent listed in the figure legend (max. 350 words).

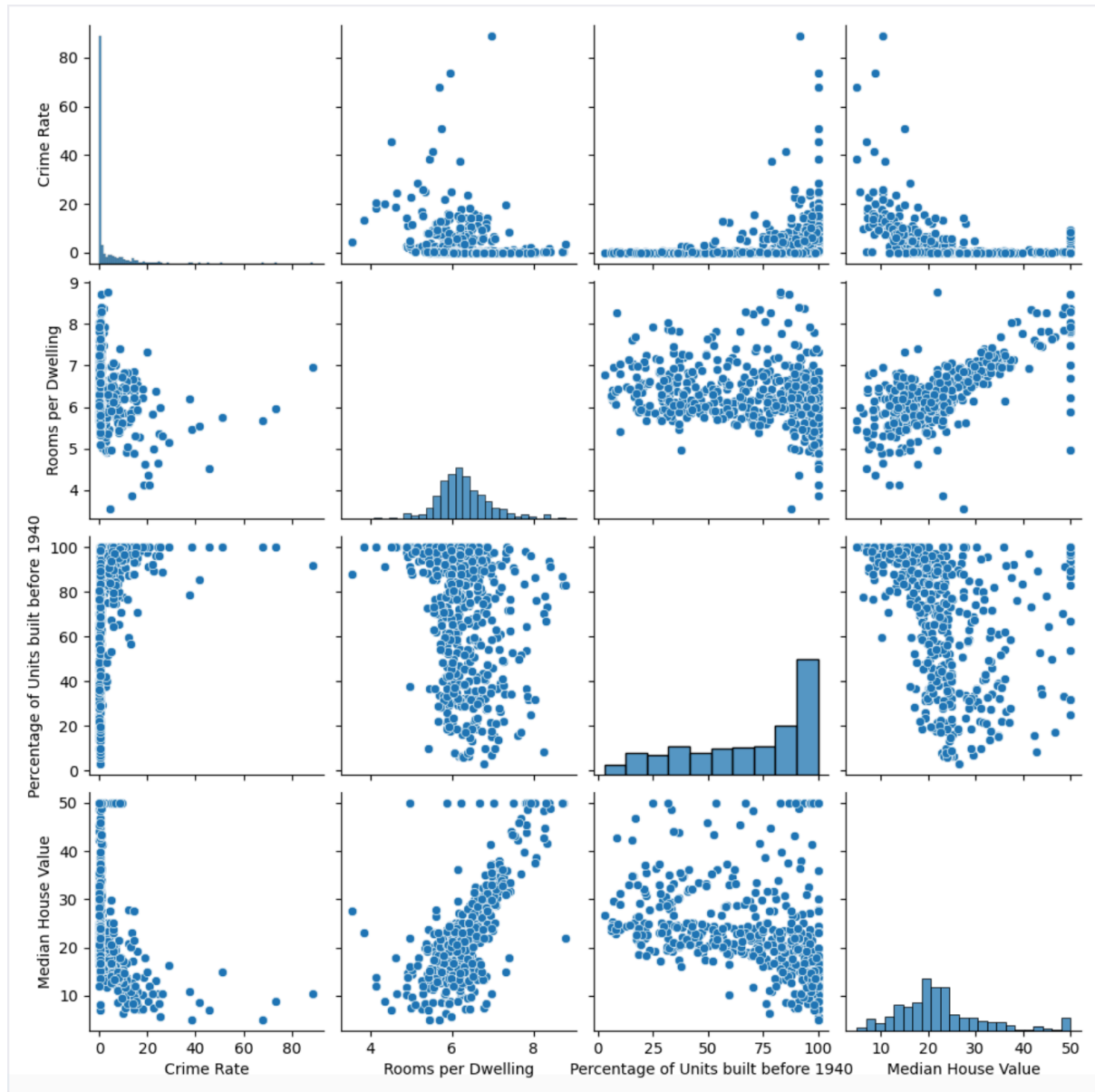
The relationship between CO2 emissions per person and GDP per capita varies across continents due to differences in economic structures, energy sources, and development levels. These relationships are complex and can be influenced by various factors.

- African countries generally have lower GDP per capita, but their CO2 emissions per person vary widely. Some African countries with a focus on sustainable development have relatively lower emissions.
- America's relationship between GDP per capita and CO2 emissions per person varies. Big countries with large populations have a higher GDP per capita but also relatively high CO2 emissions.
- Asia is diverse, with countries at different stages of economic development. Some developed Asian countries have a higher GDP per capita with lower CO2 emissions, while rapidly industrialising nations may have higher emissions.
- Europe often has a relatively high GDP per capita and has made significant strides in adopting cleaner energy sources, resulting in lower CO2 emissions per person compared to some countries of Americas and Asia.
- Oceania often has a high GDP per capita but also relatively high CO2 emissions per person due to its reliance on coal for energy.

Interesting dynamic visualisation of CO₂ emissions per capita vs. GDP per capita, 2018 [Our World in Data](#)

Practical Task 2

The following scatterplot matrix is from the Boston Housing dataset. It contains US census data concerning houses in various areas around the city of Boston. The data includes the Median House Value, Rooms per Dwelling, Crime Rate, and Percentage of Units built before 1940. Examine this graph and answer the questions.



- Which graph best represents the population of Boston as a whole? Based on this graph, explain whether Boston has a high or low crime rate.

For the best representation of the population of Boston as a whole I assume we could have the graph that shows the distribution of houses based on various factors. From the graphs above we can use Crime Rate vs Median House Value to analyse crime rate in Boston. It seems to have a comparatively low crime rate as there is a negative correlation between Crime Rate and Median House Value.

- What is the average number of rooms per dwelling in Boston?

The average number of rooms per dwelling in Boston is 6, we can see it on the histogram Rooms per Dwelling.

- What is the correlation between Rooms per Dwelling and Median House Value?

The correlation between Rooms per Dwelling and Median House Value is positive.

- By determining what percentage of units were built before 1940, are the majority of the houses relatively old or new?

The majority of the houses are relatively old.

- What is the correlation between the Percentage of Units built before 1940 and the Median House Value?

The correlation between the Percentage of Units built before 1940 and the Median House Value is more likely negative.