Task 16 - Data Visualisation I

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Compulsory 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 by male median wages. It is represented as a percentage in this graph.

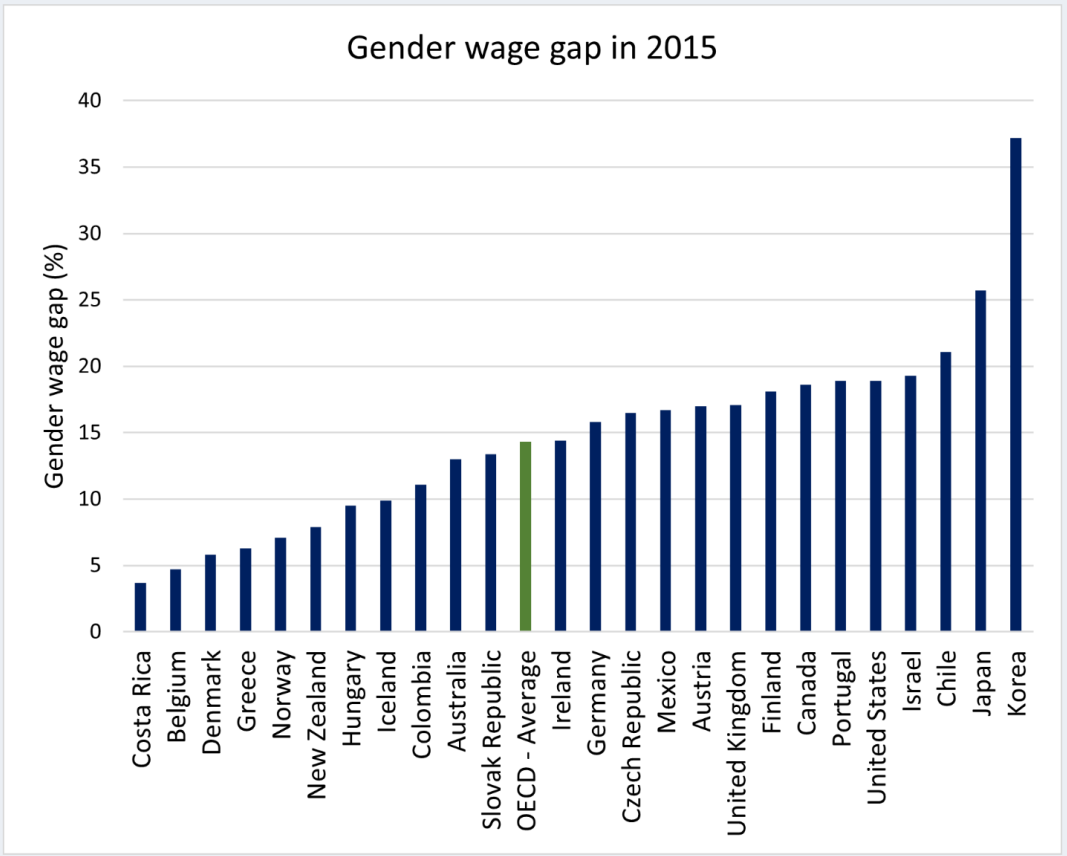


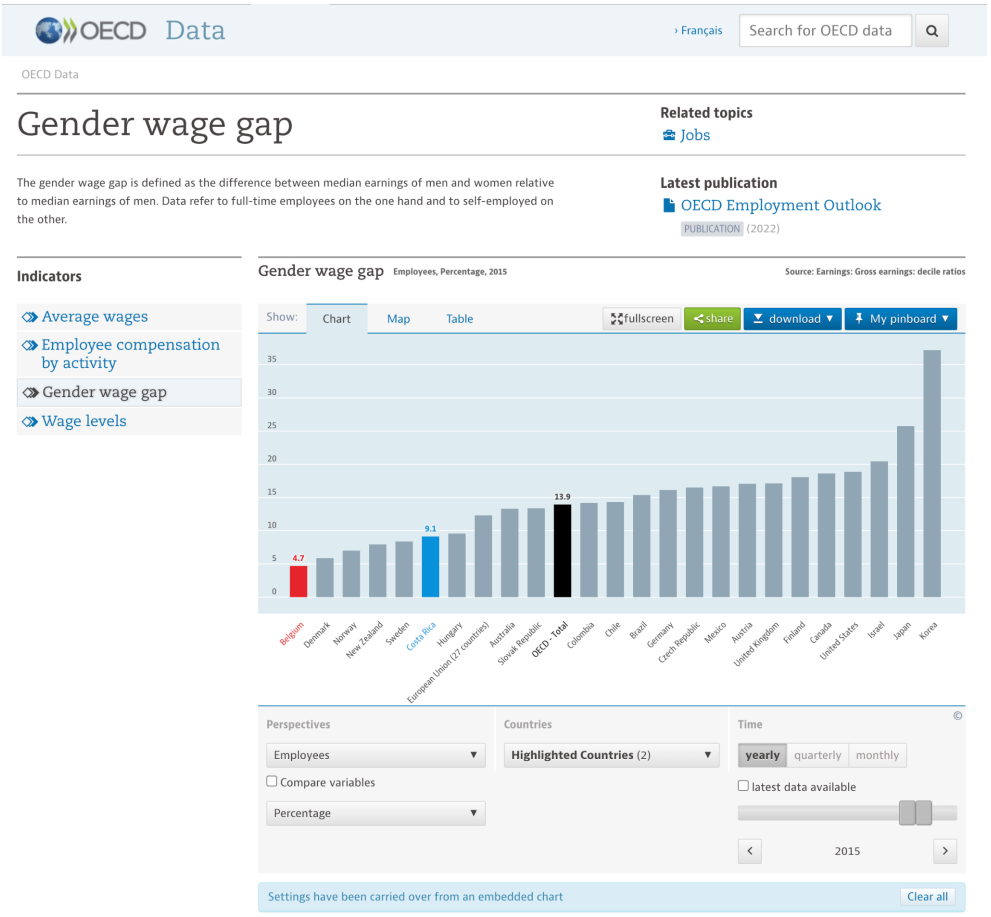
Figure 1: Gender wage gap in 2015 (**Source**)

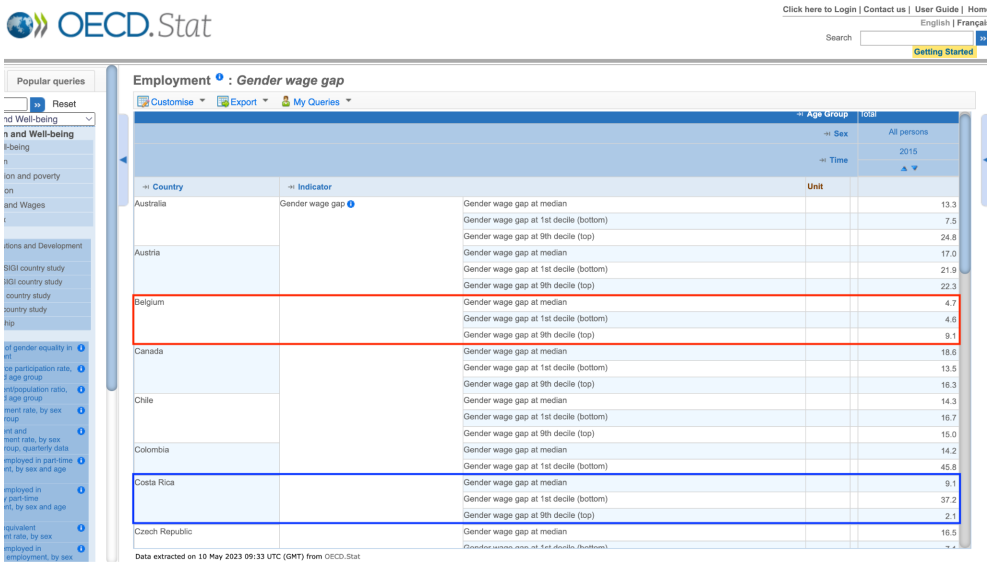
- Which three countries have the lowest gender wage gap?
  In 2015, according to the graph above, Costa Rica, Belgium, and Denmark were the three countries with the smallest gender wage gap.

- Which three countries have the highest gender wage gap?
  In 2015, according to the graph above, Korea, Japan and Chile were the three countries with the smallest gender wage gap.

- 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).

  The gender wage gap graph provided by HyperonDev needs correction. The OECD reports that Belgium has the lowest gender wage gap, not Costa Rica. The OECD uses the median gender wage gap, and their data shows that in 2015 Costa Rica's median was 9.1 while Belgium's median was 4.7. See the attached images for reference.





Now answering the question. According to the Independent journal, about 55% of Belgian workers are part of a trade union, while approximately 96% of workers are covered by collective bargaining agreements they sign. This means that instead of negotiating salaries individually with their bosses, there is a set framework for pay based on job roles. Additionally, wage increases are indexed to the cost of living, so workers don't have to request pay raises just to keep up with inflation.

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 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.

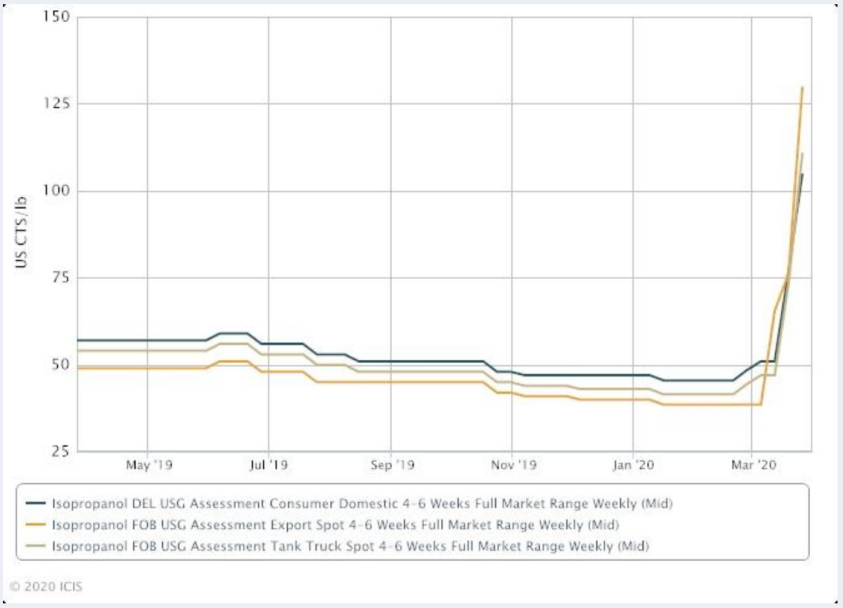


Figure 2: Isopropanol sales from May 2019 to March 2020 (**Source**)

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

  Please note that the y-axis on the graph displays the price of Isopropanol in US cents per weight, not its sales. The increased demand caused the price to rise, indicating a likely increase in sales during that period. In March 2020, the price of Isopropanol more than doubled, reaching over $1.25 (for Isopropanol FOB USG Assessment Export Spot) from about $0.50 cents.

- 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 sales and price skyrocketed in March 2020 because of the high demand for hand sanitizers during the Covid-19 crisis.

3. Below, the bubble plot (a scatter plot with variable dot size) shows carbon dioxide (CO_2) 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.

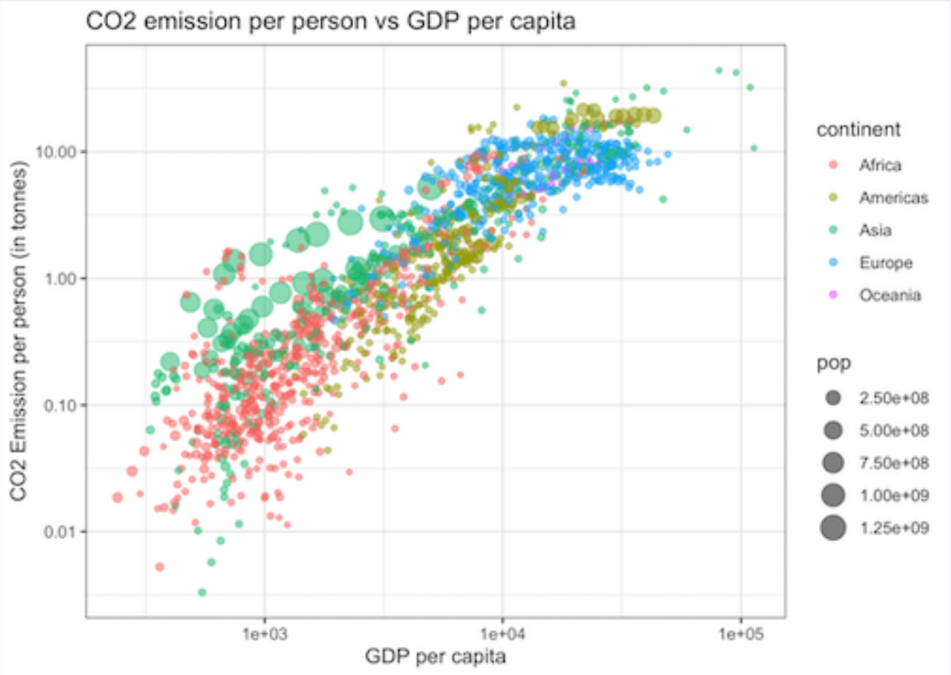


Figure 3: CO_2 emissions per person vs GDP per capita

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

  Source of study:
  https://www.westga.edu/academics/research/vrc/assets/docs/scatterplots_and_correlation_notes.pdf

  The relationship between CO2 emissions per person and GDP per capita can vary widely between continents.

  America
  The Americas, which include North America, Central America, and South America, have a strong positive correlation between CO2 emissions per person and GDP per capita as a whole. This is because the Americas are home to some of the world's largest economies, such as the United States, Canada, and Brazil, which are also major carbon emitters.

  Europe:
  Europe has a weaker positive correlation between CO2 emissions per person and GDP per capita than America. This is partly because many

European countries have implemented policies aimed at reducing carbon emissions, such as carbon taxes and investments in renewable energy. However, there are still some countries in Europe, such as Russia and Poland, which rely heavily on fossil fuels and have relatively high levels of CO2 emissions per person.

Asia:
Asia has a weak positive correlation between CO2 emissions per person and GDP per capita. This is partly due to the fact that many countries in Asia, such as China and India, have large populations and lower GDP per capita than America and Europe. However, as many Asian countries continue to industrialize and urbanize, their carbon emissions are likely to increase.

Africa:
Africa has a weak positive correlation between CO2 emissions per person and GDP per capita. This is largely because many countries in Africa are still developing and have relatively low levels of industrialization and energy consumption. However, some countries in Africa, such as South Africa and Nigeria, are heavily reliant on fossil fuels and have relatively high levels of CO2 emissions per person.

Oceania:
Oceania has a moderate positive correlation between CO2 emissions per person and GDP per capita. This is because Australia is a major emitter of carbon dioxide, with a high per capita energy consumption and reliance on coal as a primary energy source. In contrast, New Zealand has lower levels of carbon emissions per capita and has set a goal to become carbon neutral by 2050.