

Visualization Research

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Table of Contents

Executive Summary	3
1. Introduction	4
2. Visualization Critique	5
2.1 Visualization 1	5
2.1.1. Context:	5
2.1.2. Description:	5
2.1.3. Analysis:	6
2.1.4 Conclusion:	7
2.2 Visualization 2:	9
2.2.1. Context:	9
2.2.2. Description:	9
2.2.3. Analysis:	10
2.2.4. Conclusion:	11
2.3 Visualization 3:	12
2.3.1. Context:	12
2.3.2 Description:	12
2.3.3. Analysis:	13
2.3.4. Conclusion:	14
3. Conclusion:	15
4. Reference:	16

Executive Summary

This research uncovers and critiques visualizations from the OECD Health Statistics website. Comprehensive cross-national data on healthcare measures, such as spending, resources, and activities, are available from the OECD.

Data visualization principles, design decisions, and data items are examined in every visualization. Strengths and weaknesses are addressed for chart style, color, labelling, and interpretability.

Enhancing the visualizations' health data storytelling is suggested. Suggestions include layout, color, annotation, and other design changes.

The OECD's substantial health data must be visualized for stakeholders to understand healthcare expenditures and quality. This study suggests ways to improve visualizations for clearer communication.

1. Introduction

Displaying and comprehending massive datasets requires data visualization. Data insights are clearly communicated visually. Not all visualizations convey information and meaning. This data visualization critique examines three OECD healthcare data visualizations. The report evaluates these representations' strengths and weaknesses and suggests improvements.

The OECD Health Statistics database collects cross-national statistics on life expectancy, healthcare expenditures, medical resources, and healthcare usage rates from 38 OECD countries. These visualizations are aimed at politicians, healthcare professionals, and academics, although the technical jargon is explained for laypeople.

The visualizations show healthcare spending as a percentage of GDP and hospital bed occupancy rates, which readers should be familiar with. These metrics allow cross-country comparisons and long-term study of healthcare spending, access, and results. For stakeholders seeking insights into healthcare quality, prices, and resource levels, the OECD's substantial health data must be effectively presented.

The first graph shows 2021 and 2011 newborn life expectancy by sex. The second chart depicts the leading causes of preventable mortality in 26 OECD nations in 2021/2022. The final picture shows how overweight (including obesity) rates have changed since 2000.

2. Visualization Critique

2.1 Visualization 1

2.1.1. Context:

This graphic illustrates statistics on life expectancy at birth for OECD member countries and many partner countries in 2021 and 2022 (or the nearest year). The information is based on the OECD Health Statistics 2023 database and Eurostat numbers for EU countries plus Iceland, Norway, and Switzerland.

2.1.2. Description:

Each bar represents that nation or economy's life expectancy at birth in a horizontal bar chart. The bars use white diamonds for men's life expectancy and grey diamonds for women.

The y-axis lists entities from highest to lowest life expectancy vertically. This makes identifying leading and lagging economies easier.

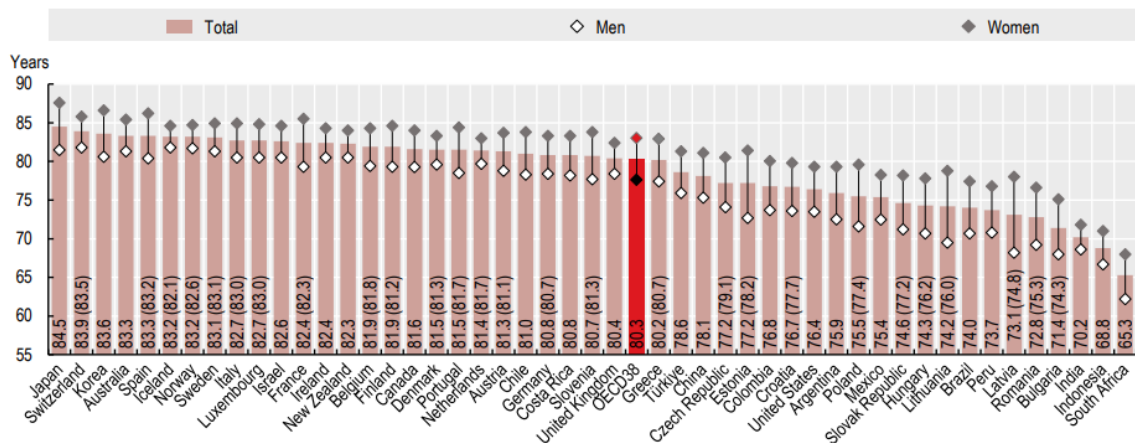
The ranges from 55 to 90 years on the x-axis are for life expectancy. Male, female, and total life expectancy values are shown on each country's x-axis.

Some bracketed data points appear to reflect possible 2022 values for Iceland and Norway, allowing for 2021 alterations analysis.


The chart compares average life expectancies in OECD countries including Switzerland, Japan, and the US. It also illustrates the global gender gap in life expectancy. Color-coding distinguishes genders.

When arranged progressively, Japan or Switzerland has the longest life expectancies, while South Africa and other partner economies have the lowest.

Figure 3.1. Life expectancy at birth by sex, 2021 and 2022 (or nearest year)



Note: Latest available data for the United Kingdom 2020; and for Türkiye 2019. Provisional 2022 values in brackets.
Source: OECD Health Statistics 2023, Eurostat 2023 for EU countries plus Iceland, Norway and Switzerland.

StatLink  <https://stat.link/5liuzr>

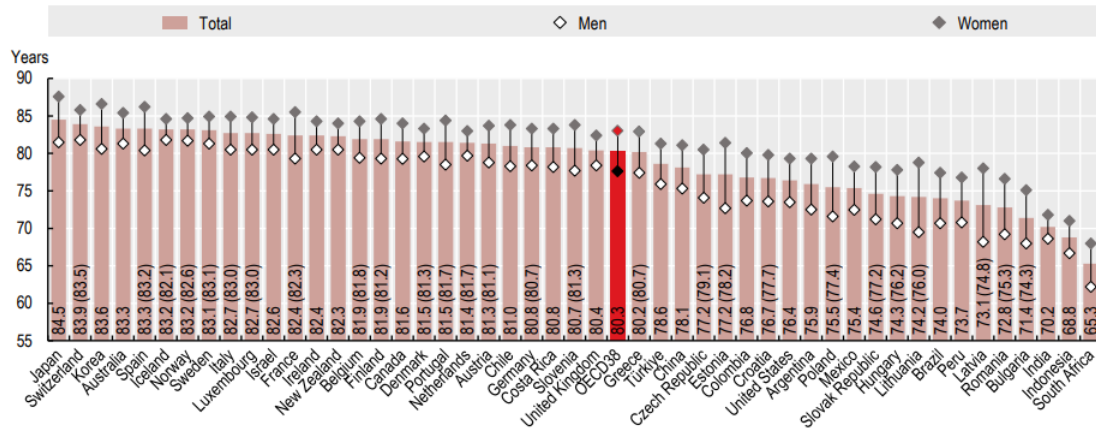
2.1.3. Analysis:

Overall, the horizontal bar chart shows life expectancy statistics from OECD nations and partners. It follows various data visualization concepts rather effectively.

The use of a bar chart enables for easier comparison of total life expectancy statistics between entities. Separating the bars into portions for men and women with different colors is an excellent technique to demonstrate the continuous gender disparity that exists in all nations. This split allows you to analyze both overall and gender-specific life expectancy indicators in the same chart.

The vertical ranking of countries from highest to lowest life expectancy allows for the quick identification of leaders such as Japan and Switzerland, as well as laggards such as Mexico and partner economies. The range on the x-axis is sufficient to capture life expectancy data.

Figure 3.1. Life expectancy at birth by sex, 2021 and 2022 (or nearest year)



Note: Latest available data for the United Kingdom 2020; and for Türkiye 2019. Provisional 2022 values in brackets.
 Source: OECD Health Statistics 2023, Eurostat 2023 for EU countries plus Iceland, Norway and Switzerland.

StatLink <https://stat.link/5liuzr>

The labels are quite clear, with nation names, life expectancy statistics, and chart titles prominently shown. However, there is space for improvement in labeling uniformity; for example, the statement about utilizing provisional 2022 figures may be incorporated into the chart title for clarification.

Improving the data-ink ratio is one of the potential ways to improve visualization. The gender-specific life expectancy numbers on the x-axis may not need to be explicitly labeled because the split bars already show these values relative to the total.

Furthermore, while color is useful for distinguishing men and women, the colors of white and grey might be modified for better visual distinction and accessibility.

Overall, the simple bar chart efficiently shows the major life expectancy numbers across OECD countries while allowing for further examination of variables such as gender disparity. With minimal tweaks, it might become an even more impressive representation of this critical health data.

2.1.4 Conclusion:

In summary, the life expectancy data among OECD nations is visually represented using a horizontal bar chart, which is largely effective. The readable bar chart form makes it simple to compare life expectancy overall and identifies the countries that are leading and trailing behind. Sensibly separating the bars by gender reveals the ongoing difference in longevity.

The chart follows several best practices, including efficient use of color, logical entity ordering, and clear labeling. Provisional data for 2022 is a helpful contribution.

Certain aspects, nevertheless, might use improvement. The visualization would be improved by incorporating the 2022 data note into the title, raising the data-ink ratio by eliminating unnecessary labels, and selecting colors for better contrast.

All things considered; this graphic does a good job of illustrating life expectancy in OECD nations following COVID-19. It can be an even more useful tool for studying this important health measure and pinpointing areas that need actions to boost longevity and close gaps if certain modifications are made.

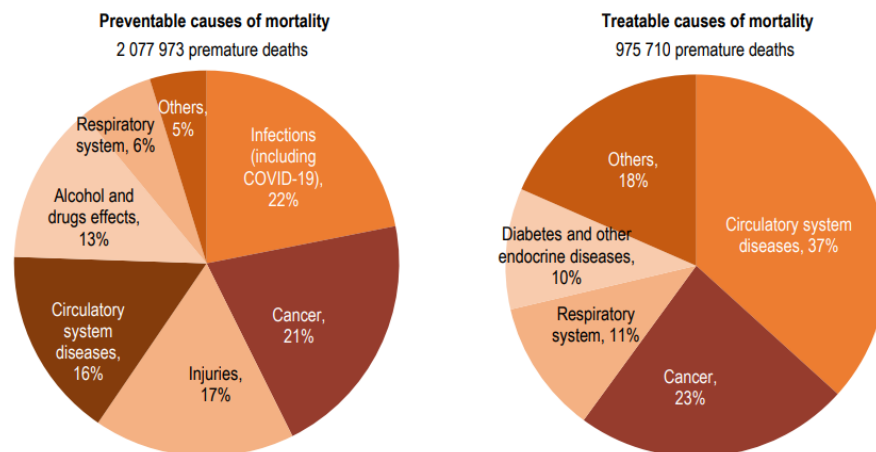
2.2 Visualization 2:

2.2.1. Context:

The second graphic talks about avoidable mortality indicators, or fatalities that might have been avoided with timely and high-quality healthcare interventions or by implementing successful public health initiatives. It divides causes of mortality into categories that are treatable (such as circulatory disorders, certain types of cancer, respiratory diseases, diabetes), and preventable (such as infectious diseases as COVID-19, some cancers, and trauma).


2.2.2. Description:

Figure 3.7. Main causes of avoidable mortality across 26 OECD countries, 2020/21



Note: The 2022 OECD/Eurostat list of preventable and treatable causes of death classifies specific diseases and injuries as preventable and/or treatable. For example, lung cancer is classified as preventable, whereas breast and colorectal cancers are classified as treatable.

Source: OECD calculations, based on the WHO Mortality Database.

StatLink  <https://stat.link/okh2rt>

The two pie charts illustrate the leading avoidable and treatable causes of premature deaths (under 75 years old) in various OECD nations for 2020 and 2021.

The left pie chart shows the leading preventable causes of death. Infectious illnesses like COVID-19 caused 22% of unnecessary deaths. Cancer (21%), traumas (17%), circulatory

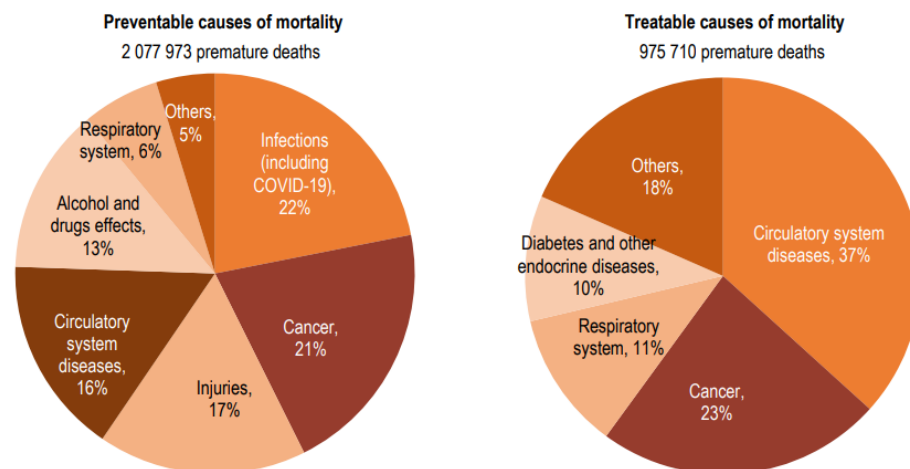
illnesses (16%), alcohol and drug impacts (13%), and respiratory diseases (6%), were other preventable reasons.

The right pie chart shows the leading curable causes of death. Cardiovascular illnesses like heart attacks and strokes caused 37% of curable deaths. Cancer was the second most treatable cause after respiratory system illnesses (11%) and diabetes and other endocrine diseases (10%) at 23%.

During the COVID-19 pandemic, these pie charts show the relative burden of diseases and maladies that cause early mortality and can be averted by better healthcare or public health activities across the OECD.


2.2.3. Analysis:

Figure 3.7. Main causes of avoidable mortality across 26 OECD countries, 2020/21



Note: The 2022 OECD/Eurostat list of preventable and treatable causes of death classifies specific diseases and injuries as preventable and/or treatable. For example, lung cancer is classified as preventable, whereas breast and colorectal cancers are classified as treatable.

Source: OECD calculations, based on the WHO Mortality Database.

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Due to their design, the pie charts involved have trouble communicating data. Using pie charts to show multiple categories, as seen below with 6-7 categories per chart, makes it difficult to compare and discern slice sizes. Bar charts or stacked bar charts would help compare mortality causes. The slices in each graphic are not ordered logically, making it harder to identify the biggest contributors. Clearer understanding is achieved by ordering the slices clockwise from largest to smallest.

Other issues include the use of legends, which require constant text-slice comparison. Putting category names and values on slices, especially larger ones, would greatly improve readability. Additionally, the reddish-brown color palette lacks contrast against the white background, which may hamper accessibility. High-contrast colorblind-friendly palettes would fix this and improve visual clarity for more people.

The charts have a broad title, but subtitles calling out "Preventable Causes" and "Treatable Causes" above each pie would help visitors understand. Percentages without the total number of deaths make it difficult to assess the data's size and importance. Total figures and percentages might help interpret the data.

Finally, averaging 2020 and 2021 data limits meaningful examination of year-over-year variations like COVID-19's rise. Analyzing trends and temporal patterns would be easier with small multiples of years. In conclusion, while pie charts have good intentions, alternate visualization approaches, improved labelling, color choices, and year separation should improve their mortality statistics communication.

I have just a few recommendations to make to enhance this visualization's overall design. First, now, the pie charts merge information from 2020 and 2021 into a single image. But viewers may examine possible trends and changes from year to year if these were divided into separate pie charts for 2020 and 2021. For instance, as the pandemic spreads from 2020 to 2021, the effect and proportion of COVID-19-related deaths most certainly increased. Rather than just displaying the combined 2-year averages, viewers would be better able to notice this shift over time if it were separated by year using small multiples. Lastly, the reddish-brown color scheme contrasts with the white backdrop somewhat subtly. Readability would be improved by using a sequential or diverging color scheme with increased contrast that is friendly to colorblind people such as blue and orange, etc...

2.2.4. Conclusion:

During the COVID-19 pandemic years of 2020 and 2021, the pie charts are intended to illustrate the primary avoidable and treated causes of premature mortality (deaths under 75) in all OECD nations. The graphs show that throughout this time, circulatory illnesses like heart attacks and strokes were the most curable cause of premature deaths, whereas infectious infections like COVID-19 were the main preventative cause.

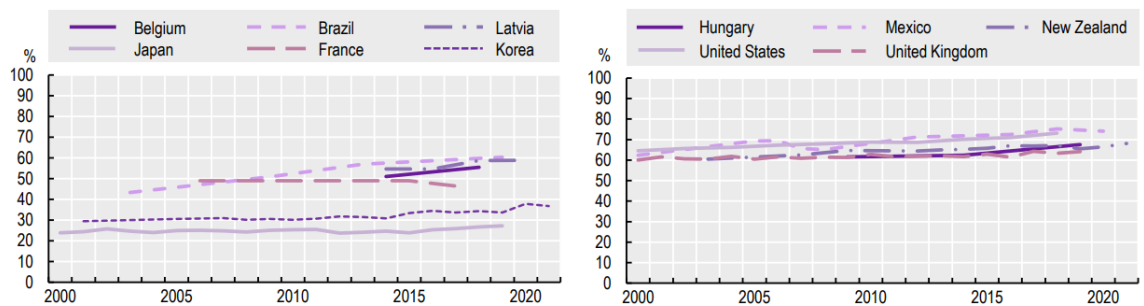
2.3 Visualization 3:

2.3.1. Context:


These graphs show how different countries' trends in overweight, and obesity are from one another. These differences may be caused by a variety of reasons, including food preferences, levels of physical activity, socioeconomic position, and the success of public health initiatives that support healthier lifestyles.

2.3.2 Description:

Figure 4.14. Evolution of measured overweight (including obesity) rates



Source: OECD Health Statistics 2023.

StatLink  <https://stat.link/jiaw5y>

The line graphs demonstrate how overweight and obesity rates have changed in a few OECD countries. The left panel shows nations with historically lower rates, right panel shows countries with higher rates.

The left panel lines representing Belgium, Japan, Latvia, Brazil, France, and Korea exhibit an increasing trend from 2000 to 2020, indicating an increase in overweight and obesity. Japan and Korea have lower rates than other nations in this panel.

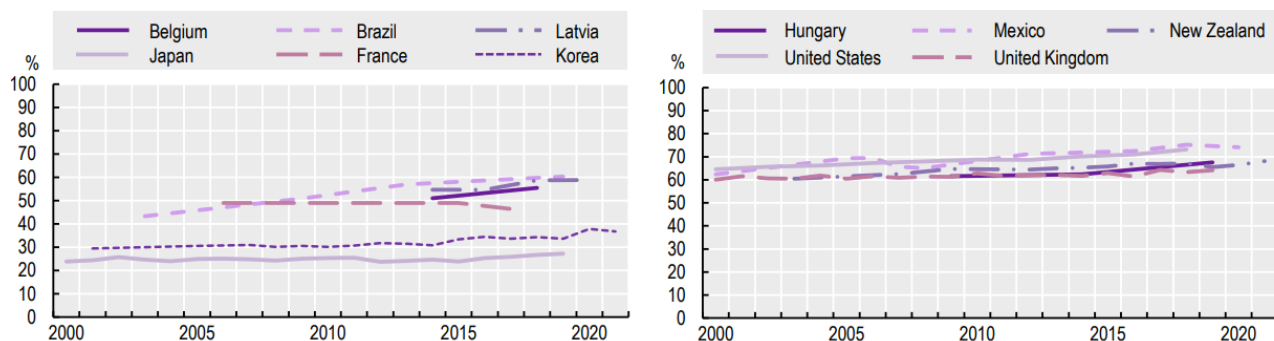
The right panel shows trends for overweight and obese countries like Hungary, Mexico, the US, New Zealand, and the UK. These countries' rising trajectories are steeper, indicating a quicker growth in overweight and obese adults over time. Over 70% of adult Mexicans and Americans are overweight or obese, which is problematic.

The majority of countries have a growing trend, but the slopes of the lines vary, indicating different rates of overweight and obesity increase. This discrepancy can be explained by socioeconomic status, physical activity, food preferences, and public health measures that promote healthier living.


These line charts highlight the worrying growth in overweight and obesity rates worldwide, national disparities, and the need for targeted public health actions.

2.3.3. Analysis:

Figure 4.14. Evolution of measured overweight (including obesity) rates



Source: OECD Health Statistics 2023.

StatLink  <https://stat.link/jiaw5y>

Line charts reveal trends in overweight and obesity across countries. Enhance clarity in several areas. The rate-based divide on the panel is easy to see but lacks panel titles. Charts have overlapping line segments, notably in the higher-rate panel. The overlap may make country trends harder to notice and analyze. Using the same color scheme and legend on both panels would help identify each country line and speed up comparison.

Although most chart lines' expanding trajectories show the overall rising trend, certain key points should be noted. Highlight atypical country trajectories like the UK's slower rise or France's fall with line thickness or remarks. Labelling, rating, or carefully altering the y-axis scale between panels increases viewer understanding of outliers and extremes, improving the data story.

Line charts can show how overweight and obesity rates have changed in different countries. Some variables must be reconsidered. Bar charts help simplify visual comparisons across all countries for a snapshot like the most recent year, while line charts indicate patterns over time. A diverging scale would show rates better than 0–100%. This would clarify rate fluctuations, especially at lower levels.

Labels greatly increase chart readability. Use consistent, clear y-axes units like "% of adult population," to aid comprehension. Formatting dates over x-axes, such as four-digit years, simplifies interpretation. Regular gridlines with x-axis labels help viewers detect patterns and changes across time, boosting trend interpretation.

By implementing data visualization best practices for readability, clarity, and focus, the line charts could better show overweight and obesity patterns. This improves audience comprehension and visualization insight.

2.3.4. Conclusion:

Finally, these line charts starkly depict the rising public health epidemic of overweight and obesity that has affected several OECD countries during the last two decades.

3. Conclusion:

Final review of OECD Health Statistics Hub visualizations shows strengths and opportunities for development. While the visualizations represent critical health statistics including life expectancy, avoidable mortality causes, and overweight/obesity trends, they may be improved for clarity, readability, and emphasis. Clearer labelling, various visualization methods, accessible color choices, and context for data understanding are recommended. Refining these visualizations according to data visualization best practices can improve their ability to communicate vital healthcare information to policymakers, practitioners, and the public.

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