

A Critical Analysis of 'COVID-19 Vaccination Tracker' by Reuters (*Reuters, 2021*)

Introduction

The following essay is a critical analysis of the data visualization techniques used in the data journalism piece 'COVID-19 Vaccination Tracker' by Reuters (*Source: [Latest updates: COVID-19 vaccination charts, maps and eligibility by country \(reuters.com\)](#)*). This project by Reuters aims to track the total number of COVID-19 vaccinations administered per country from March 25th of 2021 (publication date) up to July 15th of 2022, which estimates how many people across the world have obtained protection against the virus. This essay will offer a detailed critique of the effectiveness of data visualization techniques used to convey this information, as well as the use of UI/UX design principles present in the project. Finally, this essay will comment on how narrative has been used alongside data visualization to create a data-driven story.

How Will Data Visualization be Analysed?

Although the full project by Reuters makes use of 4 different data visualization techniques (choropleth map, bar graph, line chart and bubble graph), I will specifically be analysing the Choropleth Map and Line Chart, as I believe that one of these has been used very effectively, while the other has not been used as effectively for this project.

Each data visualization technique in the COVID-19 Vaccination Tracker (*Reuters, 2021*) will be analysed using the following criteria:

- Rationale
- Suitability
- Interactivity and User Engagement
- UI/UX Design Principles

Finally, the project will then be analysed as a whole by considering data-driven storytelling and its emotional impact.

Data Visualization Techniques

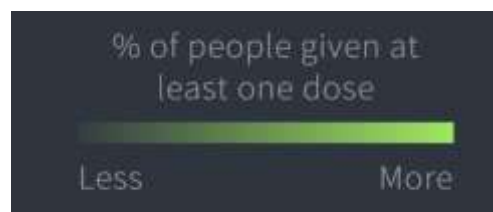
The COVID-19 Vaccination Tracker by Reuters uses a wide range of data visualization techniques to properly convey their findings. The following section of this essay will focus on the specific types of data visualization techniques used and will analyse their suitability and effectiveness.

Choropleth Map of the Globe:



Rationale

The first data visualization technique presented on the website is a 'Choropleth Map' of the Globe. A Choropleth Map consists of areas on the map shaded by according to the value of a variable (*Rogers, Castree and Kitchin, 2013*). These maps typically display higher values by using a higher intensity of colour or shade and vice versa. In the Choropleth Map above by Reuters, the intensity of the green colour present on the map indicates a higher percentage value of vaccinated citizens per country, while a less intense green or grey colour indicates a lower percentage value of vaccinated citizens per country, as indicated by the key below the map:

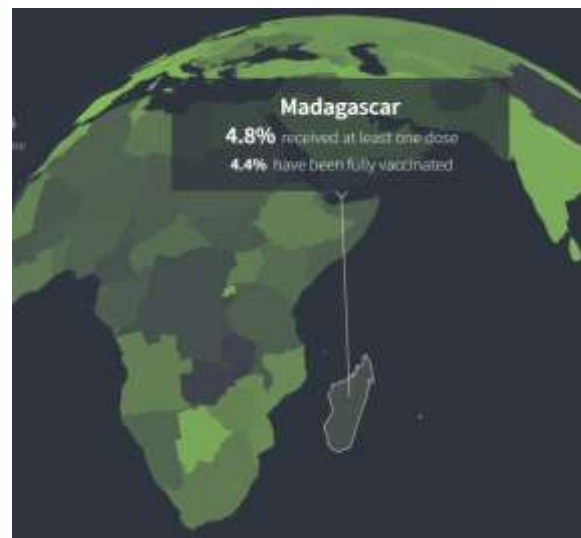


Suitability

Due to the geographical nature of this project by Reuters, the use of a Choropleth Map of the globe makes vaccination percentages per country much easier to compare to one another, as countries with a higher vaccination percentage are visibly contrasted by countries with a lower vaccination percentage. This allows the difference between countries with a higher vaccination percentage to be clearly visible against countries with a lower vaccination percentage, even upon a quick glance by a first-time viewer. The Choropleth Map in this case, therefore, allows the total vaccination percentage per country to be conveyed to the viewer in a way that is easily understandable.

According to Jenny Kidd when discussing Machin and Mayr's thoughts on representation, "... where image makers need to get a specific idea across, they will rely on established connotators which they feel confident their target audiences will understand" (2012, cited in Kidd, 2015). The specific use of the choropleth visualization in this global project is excellent

in communicating the vaccination percentages per country by using a globe. World/globe maps are widely used in schools and media, making the average person quite familiar with them, at least the basic forms of the continents, to some extent. Therefore, using the globe in this manner to display information about countries, allows viewers to gain an intuitive understanding of the vaccination statistics. If they would like to know how much of Madagascar's population has been vaccinated, they can simply navigate to Madagascar on the map.



Additionally, to ensure the correctness of information displayed, Reuters opted to use vaccination percentages rather than raw data or values. Percentages consider the total population of each country and display a percentage based on its proportionality to the total amount of doses received. This is essential when mapping a Choropleth, as there can be a significant imbalance of data, when raw values are used on a Choropleth Map, as countries with much higher populations can overshadow those with lower populations (Field, 2020).

Interactivity and User Engagement

The Choropleth Map used is interactive. It allows users to rotate or 'spin' around the globe using an input device (most commonly a mouse). Additionally, countries can also be clicked on to display more information about their vaccination statistics, including the country's name, the percentage of population that have received one vaccination dose and the percentage of population that have been fully vaccinated. Users who visit the website will be interested in these statistics and displaying them first is essential to ensure ease of navigation and understanding (UXPin, 2024). As previously mentioned, this can enhance user engagement by displaying more information based on what the user has clicked on, as well as utilizing the user's current knowledge about world maps to navigate to a specific region (Teo et al., 2003).

III/UX design principles

Downloaded from <http://ajph.org/> on November 10, 2015





The second data visualization technique presented on the website is a Line Chart which displays the number of vaccine doses administered per 100,000 people per country. According to CueMath, a line chart is defined as “a type of chart that provides a visual representation of data in the form of points that are connected in a straight line” (CueMath, 2024). Line charts are often regarded as one of most commonly used charts due to it’s simplicity, which may be a reason it has been used in the aforementioned project. Additionally, line charts also track data over time, in theory, making it suitable for the basic premise of this project.

Suitability

While the line chart by itself might be a suitable way to visualize data over time, the way it has been used in the project by Reuters negatively affects its effectiveness. Since the chart aims to track the number of doses administered per 100,000 people across 130 countries, the lines quite literally become blurred. At first glance, the chart is very cluttered. The lines representing the countries this project targeted overlap, making it difficult to determine where a specific country might lie within the graph, which in turn, makes comparing data between countries quite difficult. The only way to determine which line belongs to which country, is to slowly move the cursor across the chart, which highlights the hovered line in a green colour and displays the country name.



According to Qi Li, “Human perception plays an important role in data visualization” (Li, 2020). When looking at the above chart however, it is quite complex due to the number of countries it compares, While this is not necessarily an issue with the line chart itself, the number of lines on it simply clutters it.

Interactivity and User Engagement

The line chart does have some level of interactivity attached to it. Users can move their cursor over a line to highlight it and display the country name belonging to that line. The highlighted line also displays the number of doses per 100,000 people. However, due to the number of overlapping lines visible on the chart, it is quite difficult to pin-point a specific country, which can lead to a frustrating game of repeatedly moving the cursor as slow as possible to attempt to find a country, ultimately leading to a much less engaging experience than navigating the previously mentioned Choropleth map (Sauro, 2015).

UI/UX Design Principles

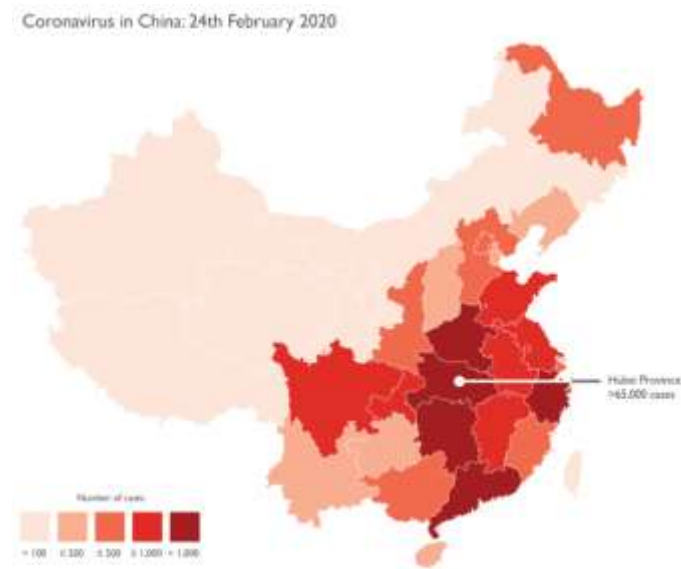
While important elements are highlighted for increased visibility, the line chart does not follow the basic UI/UX design principles (*Kodithuwakku*). The chart is congested by the overlapping lines, negatively affecting its coherence. The lack of clear differentiation between countries can make the chart quite confusing to look at. According to the University of the Witwatersrand, “70% of online business fail due to bad usability”(University of the Witwatersrand, 2024). Although the website associated with this chart might not be an online business, adhering to basic design principles could help to create a more engaging experience for the user.

While I understand that these problems are largely based on the limitations of displaying large quantities of data within a chart, I do think a few external additions could have been beneficial for ease of use and accessibility. A simple search bar, in which users could type in a country name for it to be highlighted would have been a welcome addition, as users would no longer have to guess where a country is by hovering over a line.

Data-Driven Storytelling

As a whole, the project uses the real-world crisis that was COVID-19 pandemic, along with data, to tell a story of how many people across the world have increased protection against the virus, as a result of the vaccinations they received. This project was actively updated from March 25th of 2021 up to July 15th of 2022, allowing users and health organisations to track the progress of the vaccination campaign. While at the first outbreak of the virus, its spread and potential damage on people was tracked, this project serves to track the positive effects the vaccinations has had against the virus.

By using narrative in data visualization projects, meaning is applied to data, turning it into valuable information. In this project, ‘80%’ is not just a random percentage, it represents the amount of people who have increased protection against the virus. The use of green to indicate countries with a higher vaccination percentage is quite effective. Green is often associated with being ‘correct’ or positivity (*Cherry, 2023*), therefore indicating that countries with a higher vaccination percentage have a more positive effect on the population against the virus. For contrast, here is a choropleth map indicating the number of COVID-19 cases in China:



Conclusion

While both charts at the minimum display vaccination information across countries, it is important to ensure that the data being visualized is presented in a visually coherent way that aims to engage the user. The data presented should not take away from itself by confusing the viewer and where possible the addition of external elements, such as search bars, could assist the user in navigating the chosen data visualization technique.

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