



**UNIVERSITY OF  
PORTSMOUTH**

**COURSEWORK 1**

**MODULE TITLE- DATA VISUALISATION AND EXPLORATORY  
ANALYTICS**

**MODULE CODE- M33148**

**MODULE COORDINATOR- Dr Elisavet Andrikopoulou**

**TOPIC- A Comprehensive Portfolio of Visualisations in Tableau**

**DATE OF SUBMISSION- 31st March, 2025**

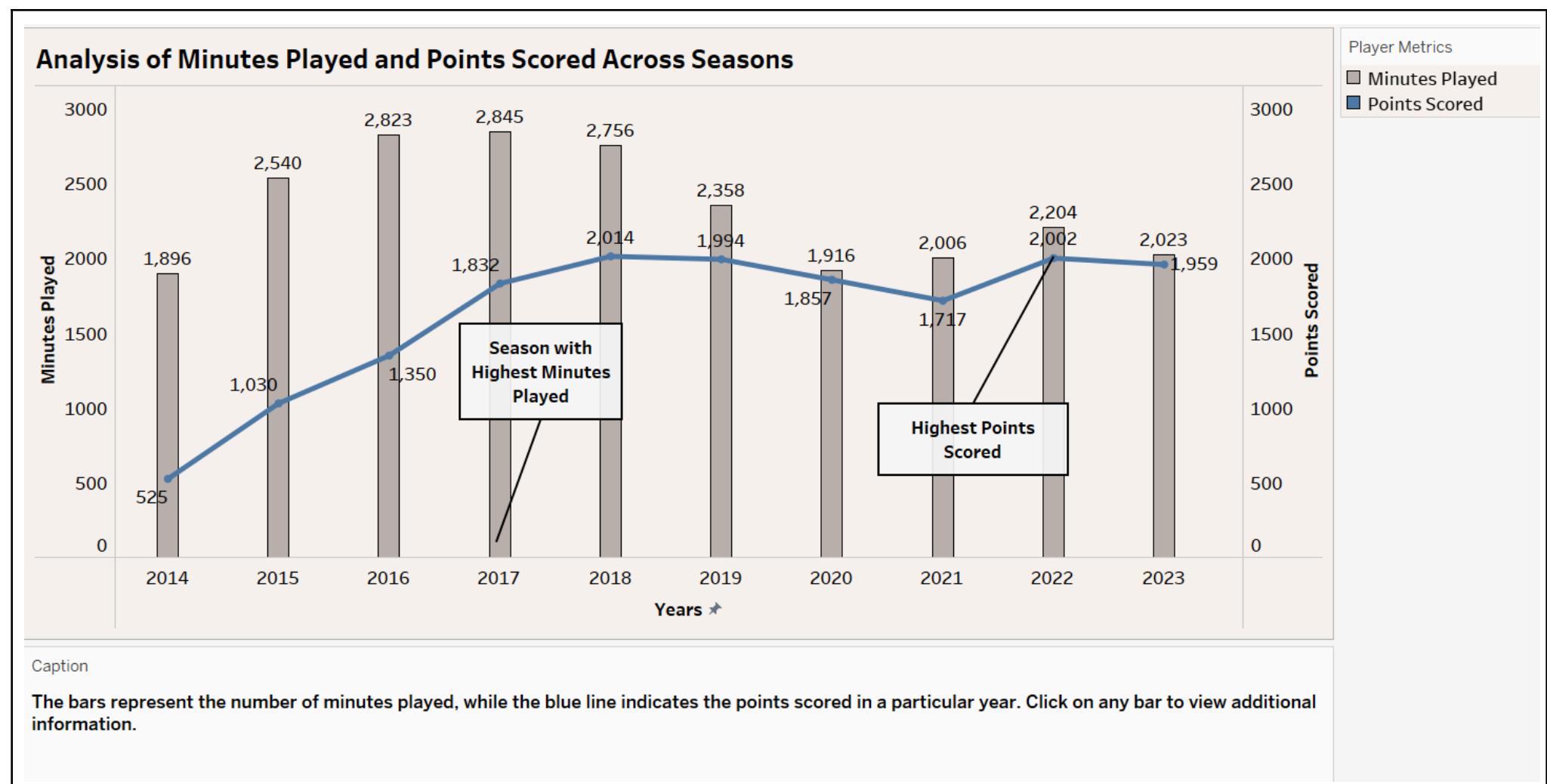
**Submitted By- UP2280648**

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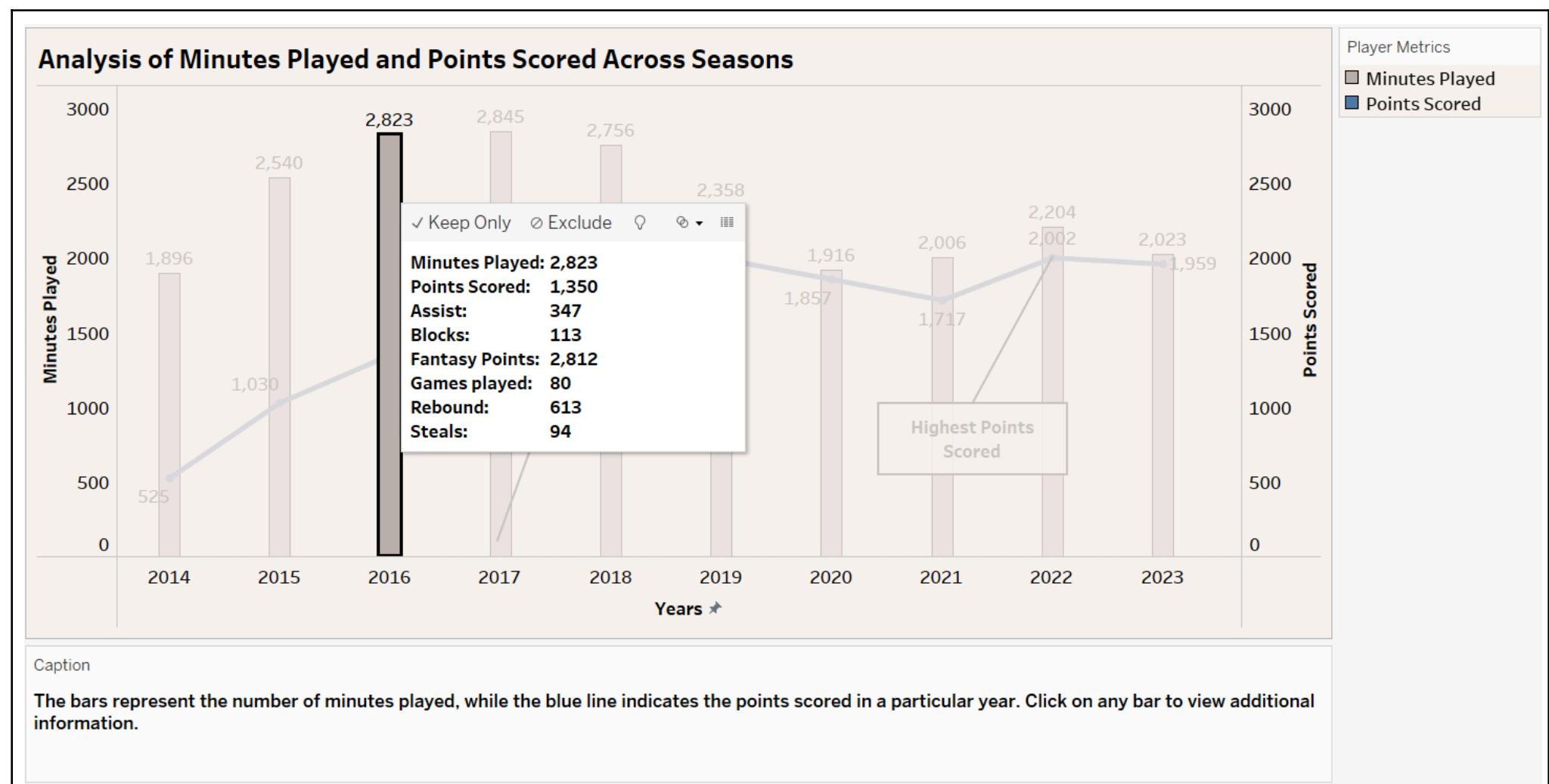
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## 1. Visualisation-1

### (i) Analysis of Minutes Played and Points Scored Across Seasons



### (ii) Analysis of Minutes Played and Points Scored Across Seasons (Screenshot taken with the Tooltip)



Click [here](#) for the interactive visualisation on Tableau Public

(A) Dataset: [Antetokounmpo fantasy stats EA](#) (Row 1, Dataset Option 1)

(B) Visualisation Type: Dual Axis Line and Bar Chart (Saxena, 2024)

(C) Display Medium: The visualisation can be published on sports analytics websites (e.g., ESPN or Basketball Reference). Additionally, it can be shared on sports pages on Instagram, Facebook, or TikTok to engage sports enthusiasts.

(D) Purpose: To analyze Giannis Antetokounmpo's basketball performance over the years (2014-2024)

(E) Message Conveyed: This visualisation provides insights into Antetokounmpo's basketball performance based on Minutes Played and Points Scored in 10 years, from 2014 to 2024. It can be inferred from the plot that his points steadily increased and reached a

career high in **2022**. While his playing time peaked in **2017** and later declined, he has remained highly efficient and continues to score well even with fewer minutes.

#### (F) Target Audience:

- Sports Analyst
- Sports Journalist
- Basketball fans

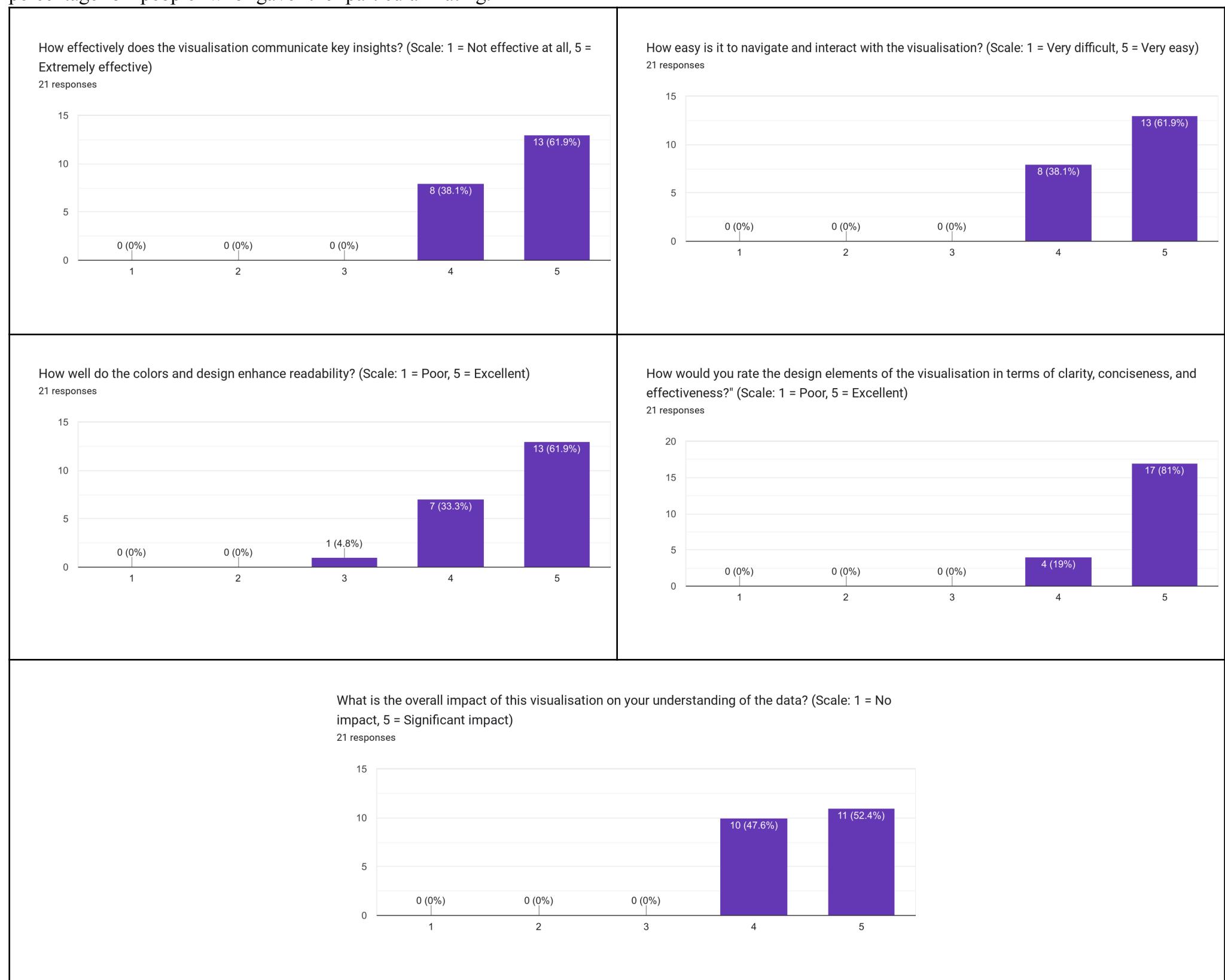
#### (G) Design Choices:

- **Attractiveness:** The use of grey bars with a striking blue line is used to produce a visually attractive contrast between **Minutes Played** and **Points Scored** that immediately draws attention to Giannis's performance trends. (Becker, 2024)
- **Usability:** The **Minutes Played** and **Points Scored** are aligned on a common time axis, this dual-axis design allows users to compare performance over 10 years effortlessly. (ChartExpo, n.d.)
- **Readability:** Clear annotations, axis labels, well-placed numbers, a balanced grey-blue contrast, and well-defined legends are used to ensure easy readability and quick interpretation of the visualisation. (Chip, 2022)

#### 4C Aspects: (Data Practices, n.d.)

- **Clean:** A minimalist and clutter-free design is used for better focus.
- **Clear:** The target audience and the message being conveyed are clearly defined and effectively communicated.
- **Concise:** Only essential details are shown in order to avoid unnecessary overload of information.
- **Captivating:** Strong color contrast, bold text where needed, and a prominent heading is used to make the visualisation engaging.

**(H) Impact & Proof of Impact:** A survey of 21 people were conducted and the below questions were asked related to the visualisation. The x-axes of the below graphs represent the ratings and the bars represent the number and percentage of people who gave the particular rating.



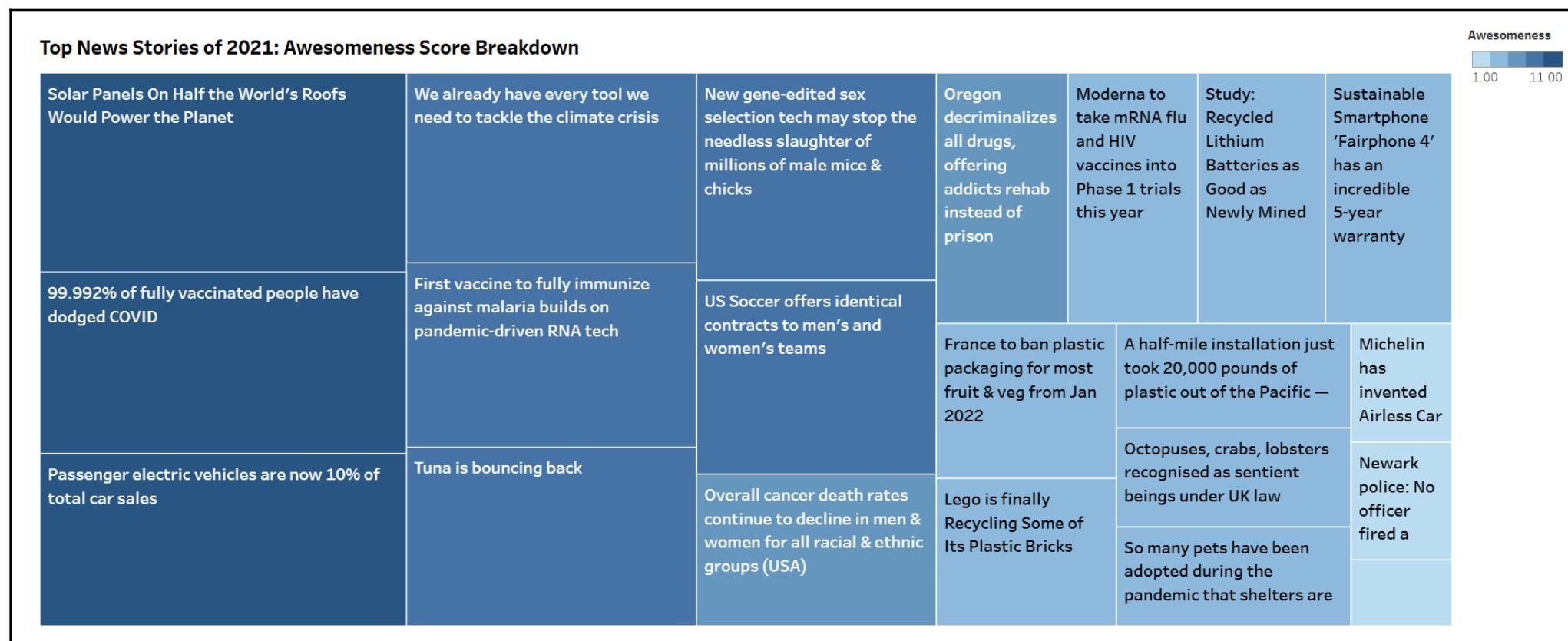
[Click to see Google Form Responses](#)

#### Feedback Consideration and Proof of Implementation:

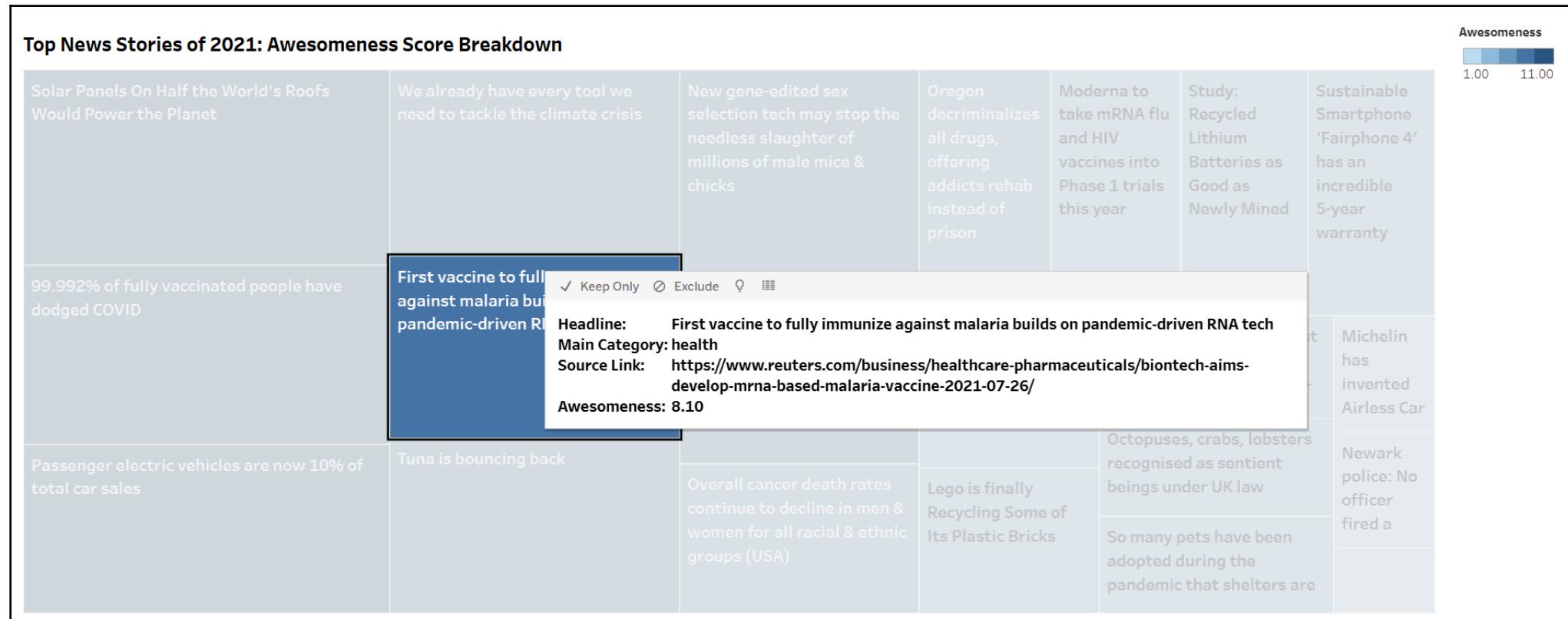
Initially, the bars in the bar graph were positioned such that their starting and ending points on the X-axis fell between two years, while the points in the line graph aligned directly with the years. However, after the review, the issue has been resolved, and now both the bar and line graph points are correctly aligned with the years on the X-axis for consistency and clarity.

## 2. Visualisation-2

### (i) (a) Top News Stories of 2021: Awesomeness Score Breakdown

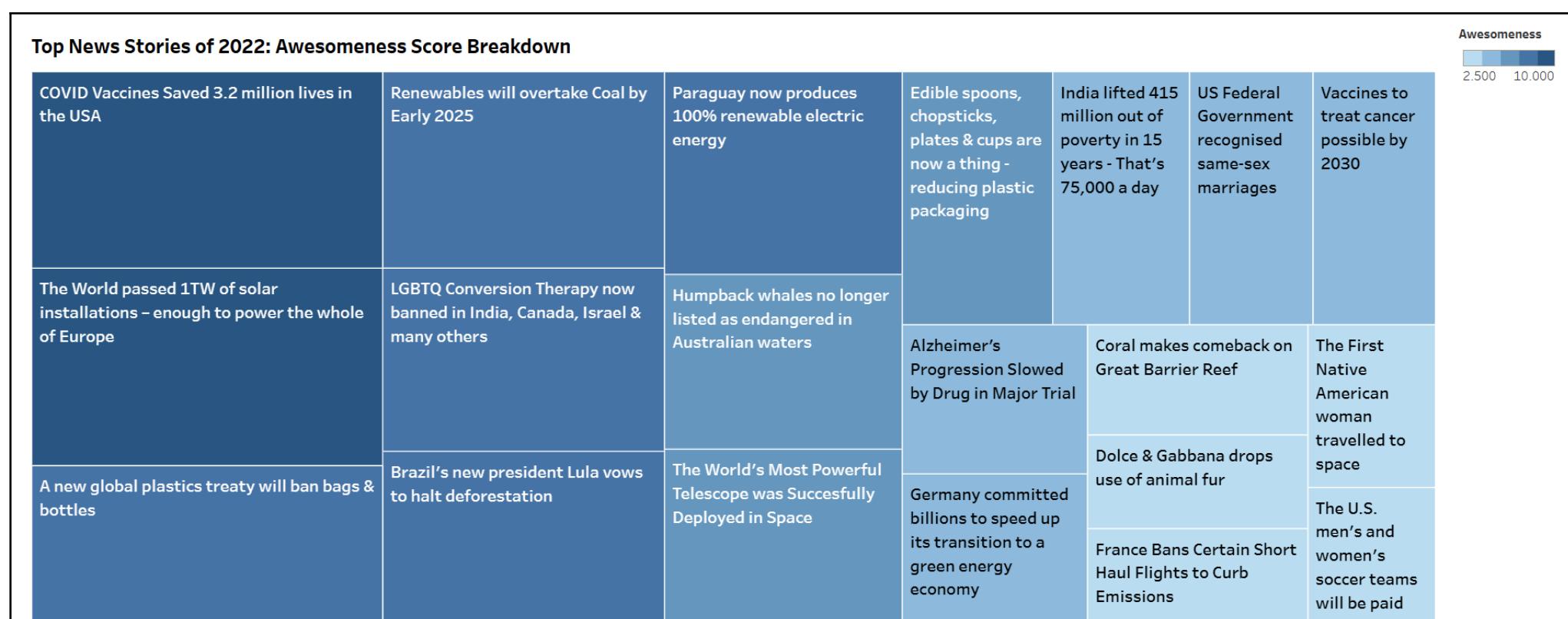


### (i) (b) Top News Stories of 2021: Awesomeness Score Breakdown (Screenshot taken with Tooltip)

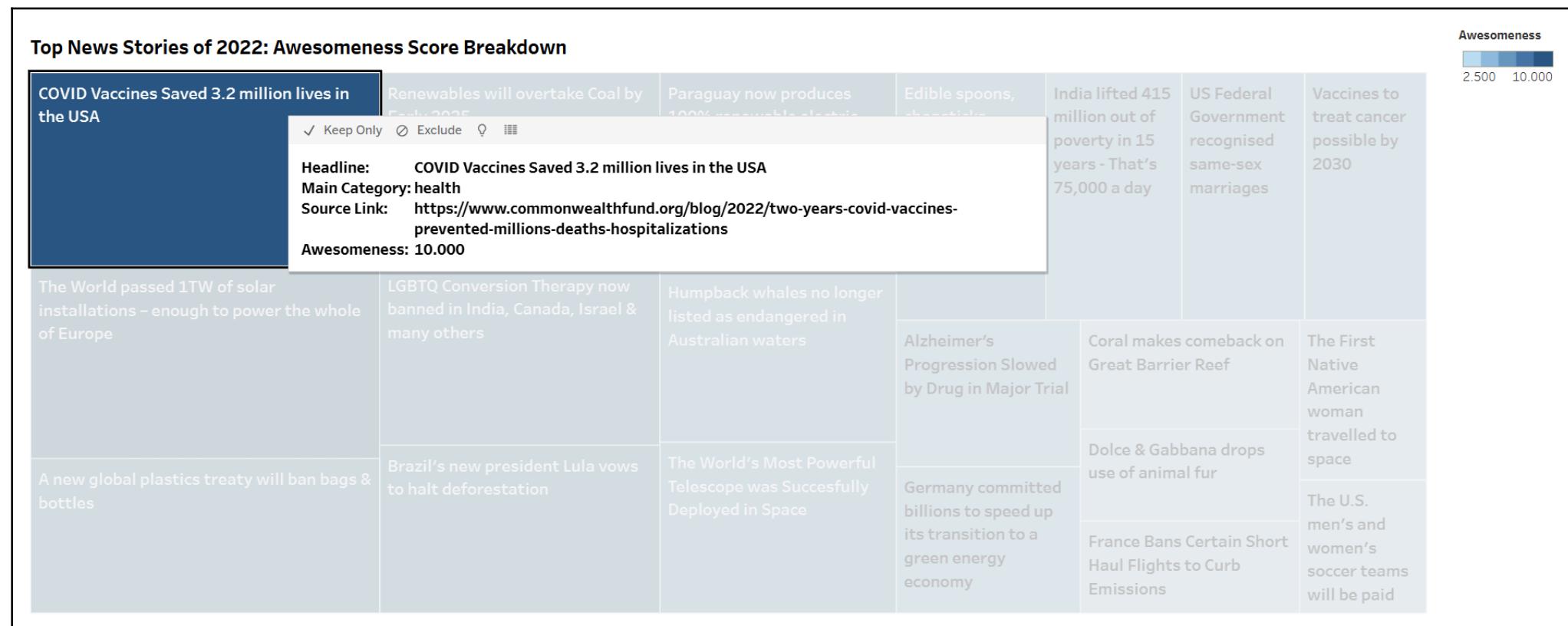


(Click [here](#) for the Interactive Visualisation on Tableau Public)

### (ii) (a) Top News Stories of 2022: Awesomeness Score Breakdown

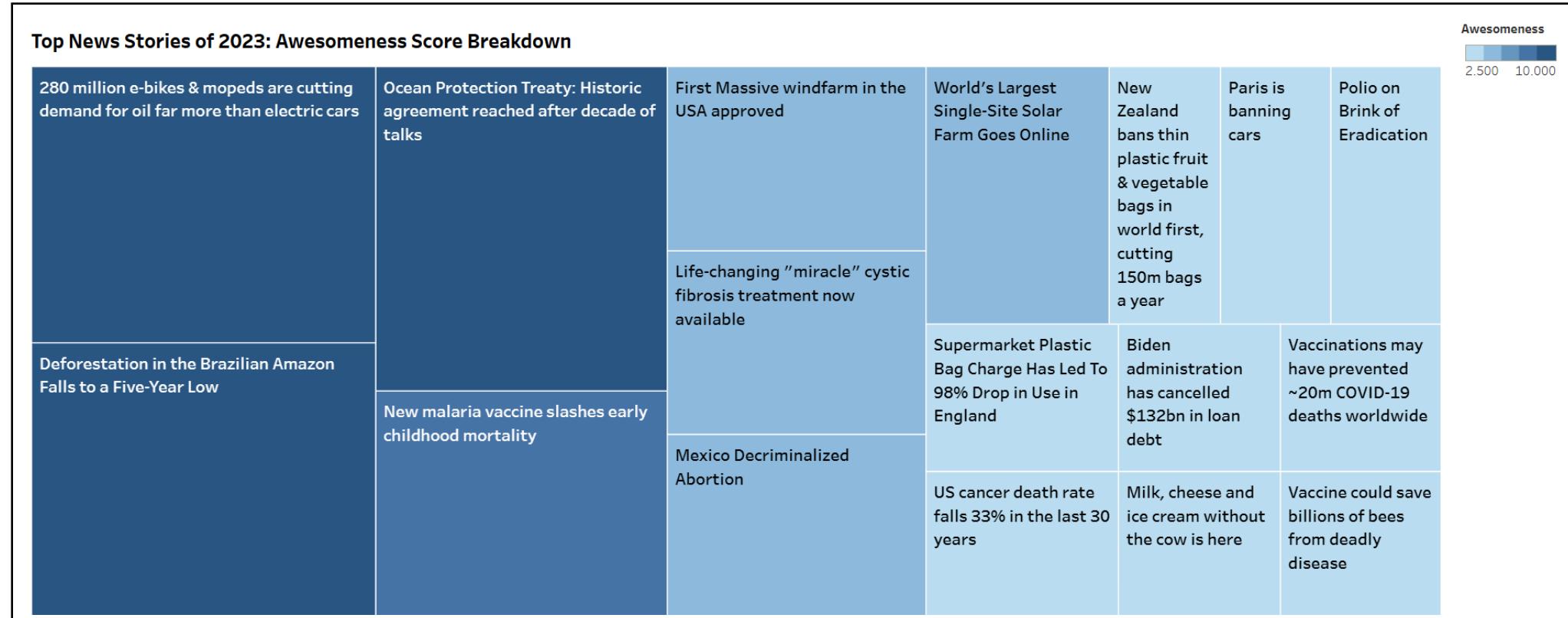


## (ii) (b) Top News Stories of 2022: Awesomeness Score Breakdown (Screenshot taken with Tooltip)

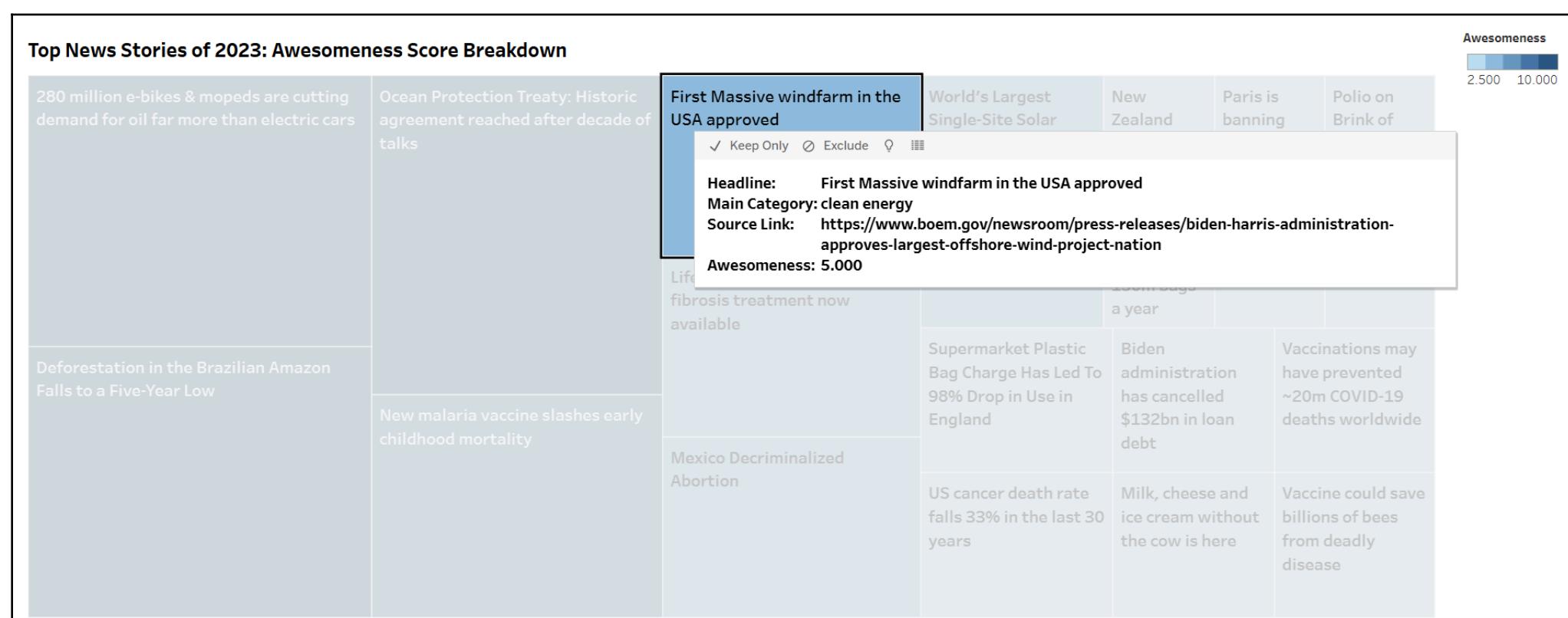


(Click [here](#) for the Interactive Visualisation on Tableau Public)

## (iii) (a) Top News Stories of 2023: Awesomeness Score Breakdown



## (iii) (b) Top News Stories of 2023: Awesomeness Score Breakdown (Screenshot taken with Tooltip)



(Click [here](#) for the Interactive Visualisation on Tableau Public)

(A) Dataset: [Most Beautiful News of 2021,22,23 EA](#) (Row 2, Dataset Option 2)

(B) Visualisation Type: Treemap (Tableau, n.d.)

(C) Display Medium: The above visualisations can be published on news analytics platforms (e.g., **MediaCloud**, **Chartbeat**, **NewsWhip**, etc.). It can also be published on social media pages that curate and craft news headlines (e.g., **BBC**, **CNN**, etc.).

(D) Purpose: The main purpose of this visualisation is to highlight the top news headlines of the given year (eg, **2021**, **2022** and **2023**) based on the **awesomeness score**. This aims to provide quick insights into the most impactful news headlines of the year.

(E) Message Conveyed: The visualisations organise the top news headlines of **2021**, **2022**, and **2023** based on their **awesomeness scores**. This enables users to **highlight, compare and categorise** the most important news headlines of the year.

(F) Target Audience:

- Journalists
- Media analysts
- News editors
- News enthusiasts

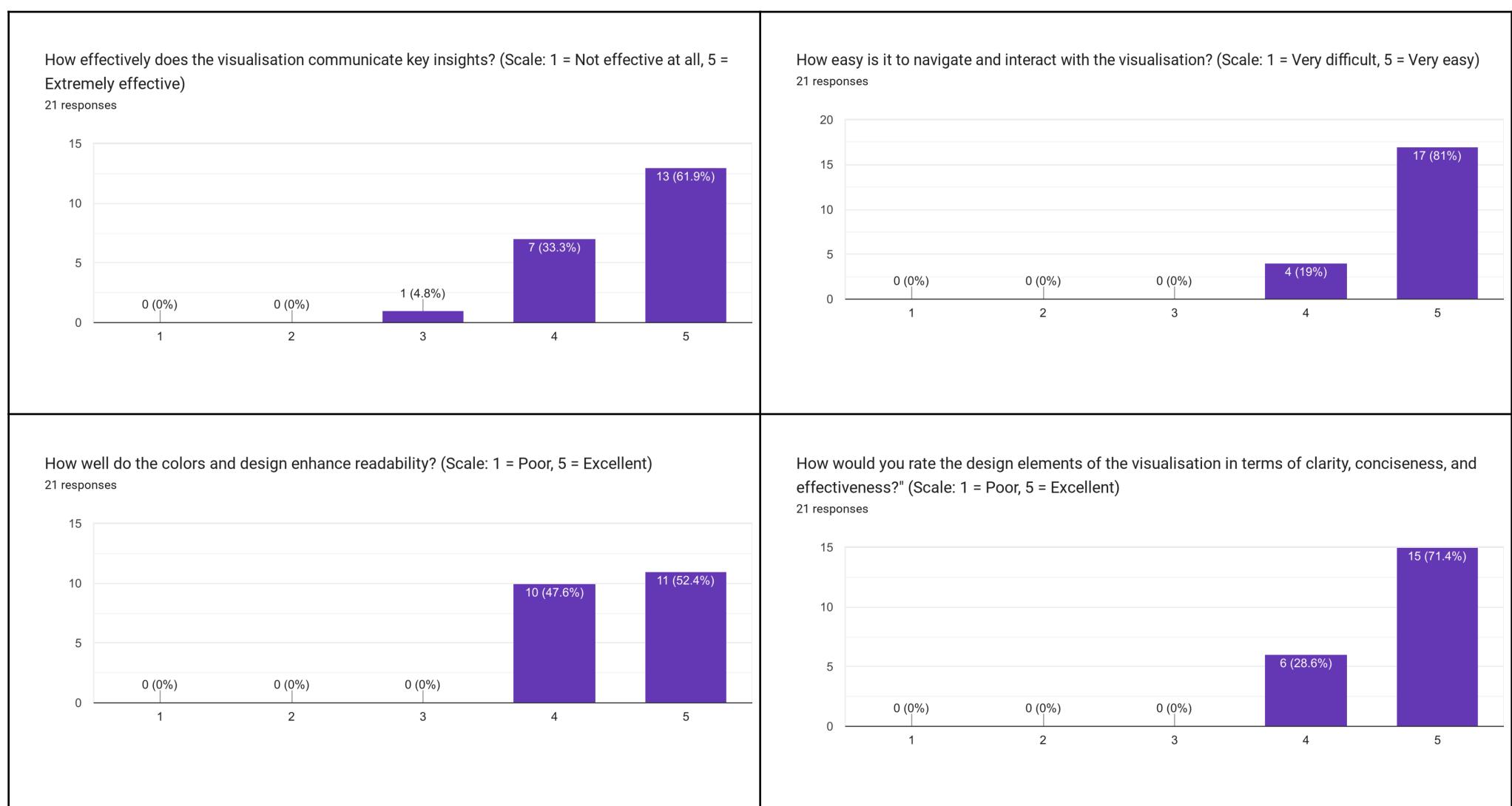
(G) Design Choices:

- **Attractiveness:** A darker blue shade is used to represent news headlines with higher awesomeness score whereas a lighter blue shade is used for news headlines with lower awesomeness score, creating a striking color contrast effect. (Becker, 2024)
- **Usability:** The **treemap** layout is used to quickly compare the news headlines based on awesomeness score, greater the size of the rectangle indicates a greater awesomeness score of the headline. Moreover, the news headlines are placed Strategically from left to right based on awesomeness score with news headlines of higher awesomeness score appearing in the left most side. (Learnist.org, n.d.)
- **Readability:** The news headlines in each rectangle is bolded to improve readability. The tooltip is used to provide additional information related to the news headline without cluttering the main visualisation. The use of legend for proper interpretability and readability of the visualisation. (Chip, 2022)

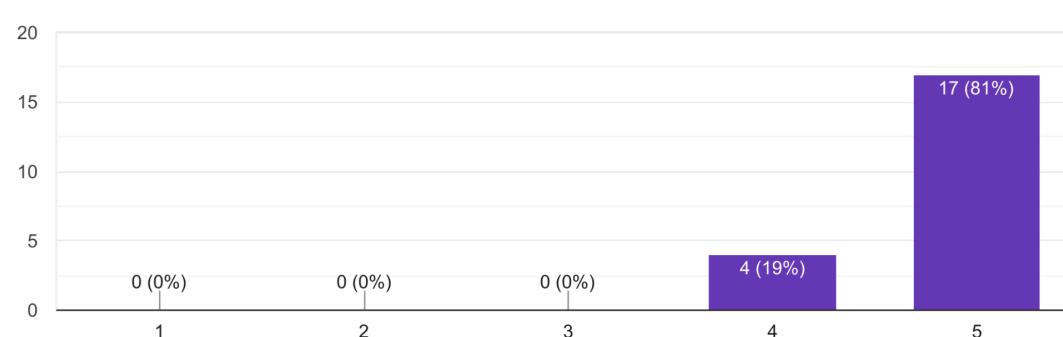
4C Aspects: (Data Practices, n.d.)

- **Clean:** A simple layout and design is used to ensure a clutter-free visual experience of the user.
- **Clear:** The target audience and the message being conveyed are clearly portrayed.
- **Concise:** The main focus is given to the headlines and the awesomeness score associated with it, this avoids unnecessary overload of information.
- **Captivating:** The strong color contrast, size variations of the rectangles and the prominent heading is used to enhance the engagement and visual appeal.

(H) Impact & Proof of Impact: A survey of 21 people were conducted and the below questions were asked related to the visualisation. The x-axes of the below graphs represent the ratings and the bars represent the number and percentage of people who gave the particular rating.



What is the overall impact of this visualisation on your understanding of the data? (Scale: 1 = No impact, 5 = Significant impact)  
21 responses

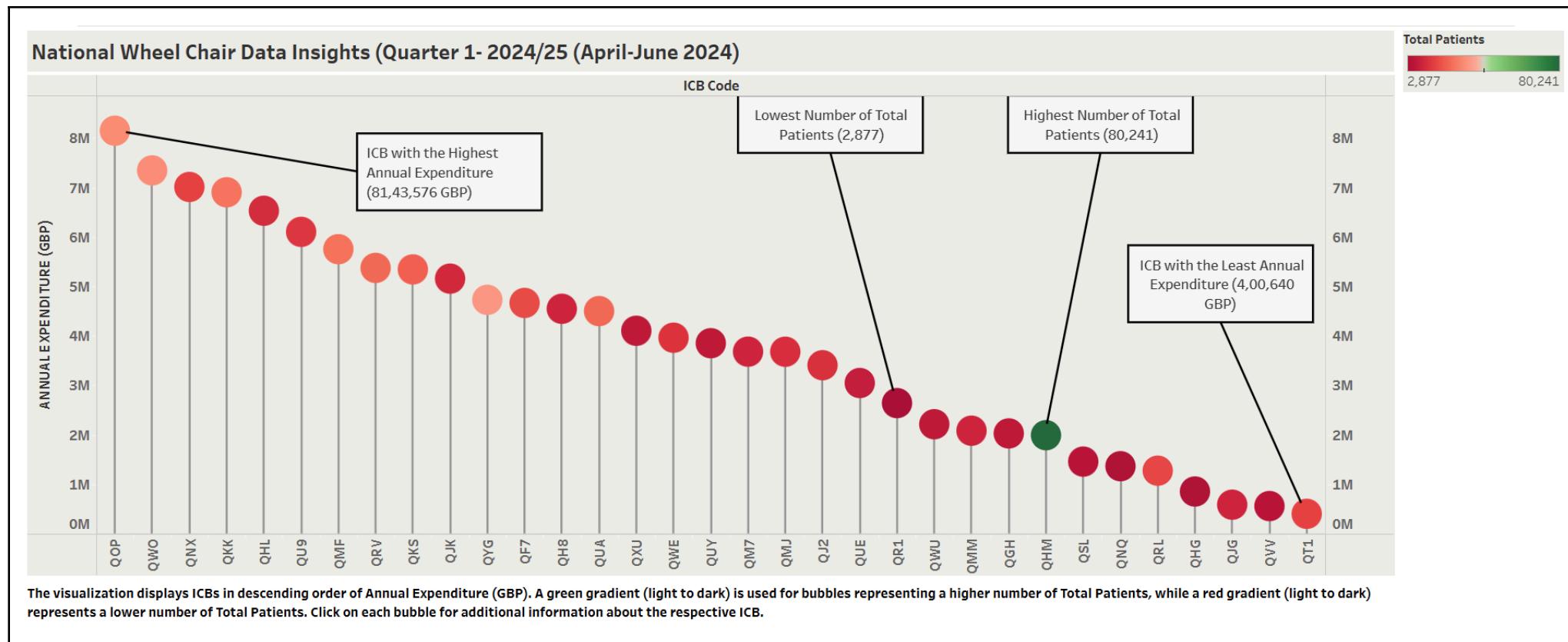


[Click to see Google Form Responses](#)

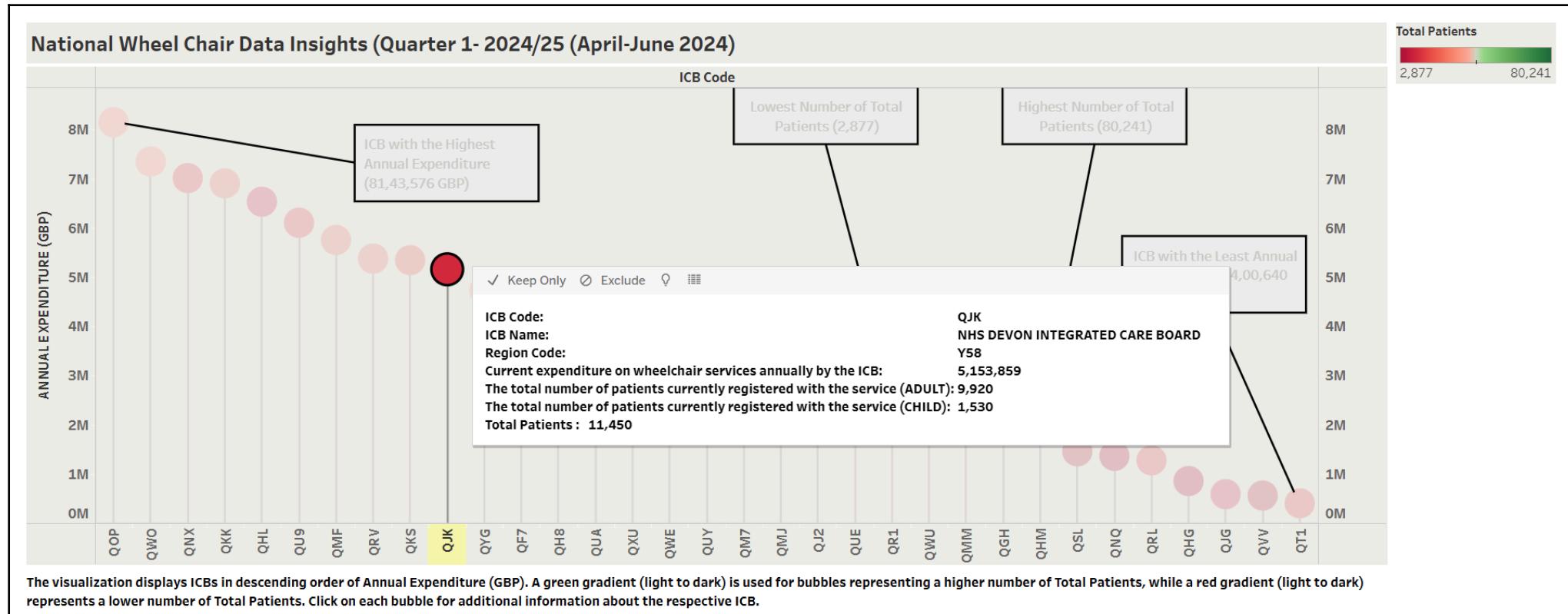
**Feedback Consideration and Proof of Implementation:** The fonts of the news headlines were made bigger for better readability and visibility as mentioned by one of the reviewers.

### 3. Visualisation-3

#### (i) National Wheelchair Data Insights (Quarter 1-2024/25 (April-June 2024)



#### (ii) National Wheelchair Data Insights (Quarter 1-2024/25 (April-June 2024)) (Screenshot taken with Tooltip)



(Click [here](#) for the Interactive Visualisation on Tableau Public)

(A) Dataset: [National-Wheelchair-Data-Collection-Results-April-June-2024 EA](#) (Row 3, Dataset Option 1)

(B) Visualisation Type: Lollipop Chart (Tableau, n.d.)

(C) Display Medium: The above visualisation can be mainly published on digital UK healthcare data platforms such as [NHS England's Statistics Hub](#), [The King's Fund Insight and Analysis](#), and [NHS Digital's Statistical Publications](#).

(D) Purpose: The main purpose of this visualisation is to provide insights into the annual expenditure on wheelchair services across ICBs (Integrated Care Board). Furthermore, this visualisation will help to identify spending patterns and distribution of patients registered for wheelchair service across different regions.

(E) Message Conveyed: The visualisation showcases how different ICBs allocate funds for wheelchair services and the number of patients opting for the service across different regions.

(F) Target Audience:

- Healthcare policymakers
- NHS and ICB administrators
- Healthcare analysts and researchers
- Public health officials

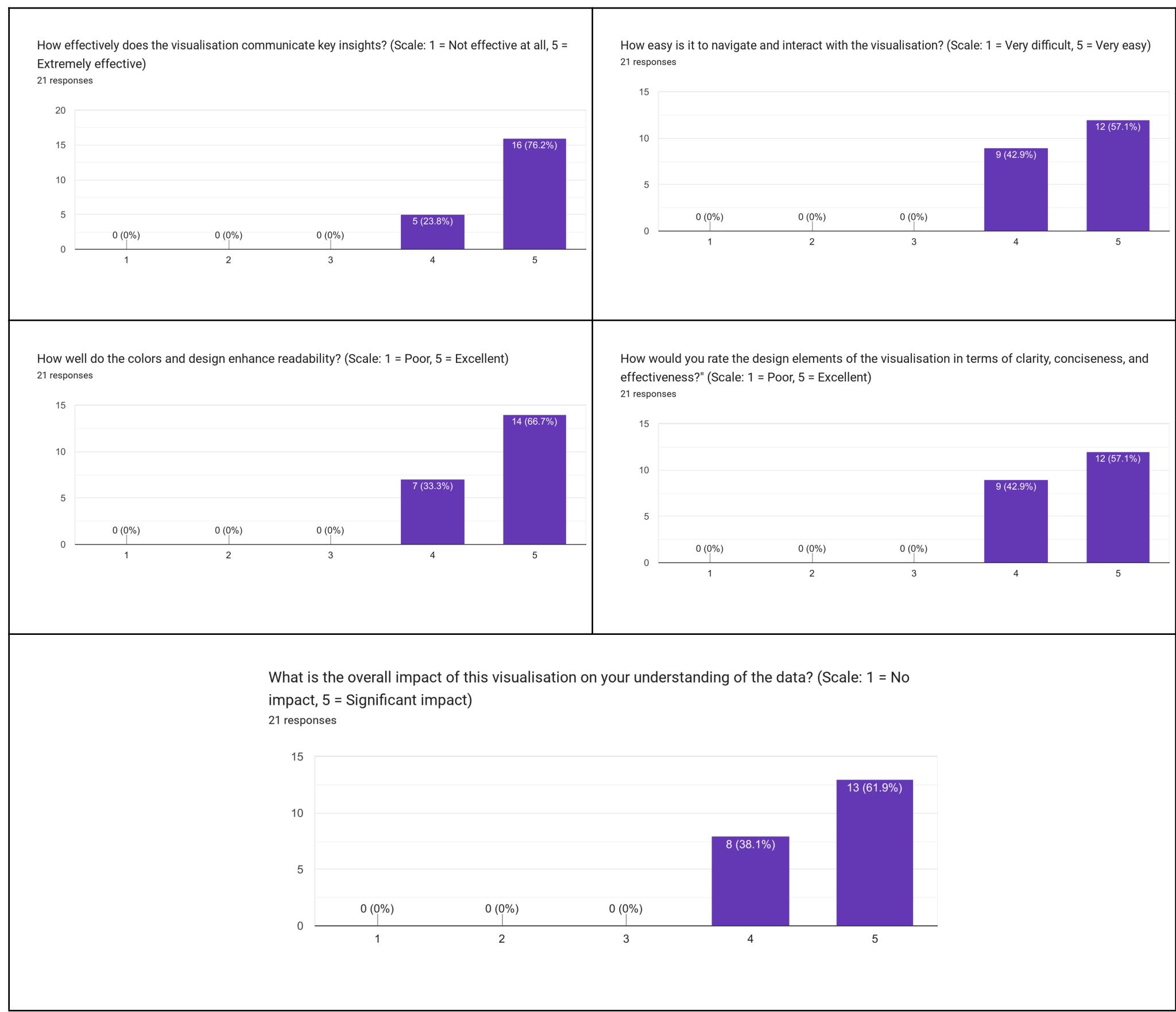
**(G) Design Choices:**

- **Attractiveness:** A gradient of green (light to dark) is used for bubbles representing a higher number of Total Patients, creating a clear visual contrast with bubbles representing a lower number of Total Patients, which are shaded in a gradient of red (light to dark). (Becker, 2024)
- **Usability:** The **lollipop** chart layout is used for easy comparison of ICB annual expenditures across different regions arranged in descending order of annual expenditure. The bigger the size of the bubble represents more number of Total Patients registered for the service in a given region. (Data to Viz, n.d.)
- **Readability:** The proper annotations, bold axis labels, prominent heading, legend for interpreting the total number of patients, and tooltips providing additional information make the visualization clear and enhance its readability. (Chip, 2022)

**4C Aspects:** (Data Practices, n.d.)

- **Clean:** A simple and less complicated design is used to ensure smooth user experience.
- **Clear:** The message is properly conveyed and the audience is clearly targeted.
- **Concise:** The visualisation focuses mainly on key metrics- expenditure and patient numbers across different regions, this avoids unnecessary overload of information.
- **Captivating:** The use of color gradients, bold text, and a structured layout is used to draw people's attention and engagement.

**(H) Impact & Proof of Impact:** A survey of 21 people were conducted and the below questions were asked related to the visualisation. The x-axes of the below graphs represent the ratings and the bars represent the number and percentage of people who gave the particular rating.



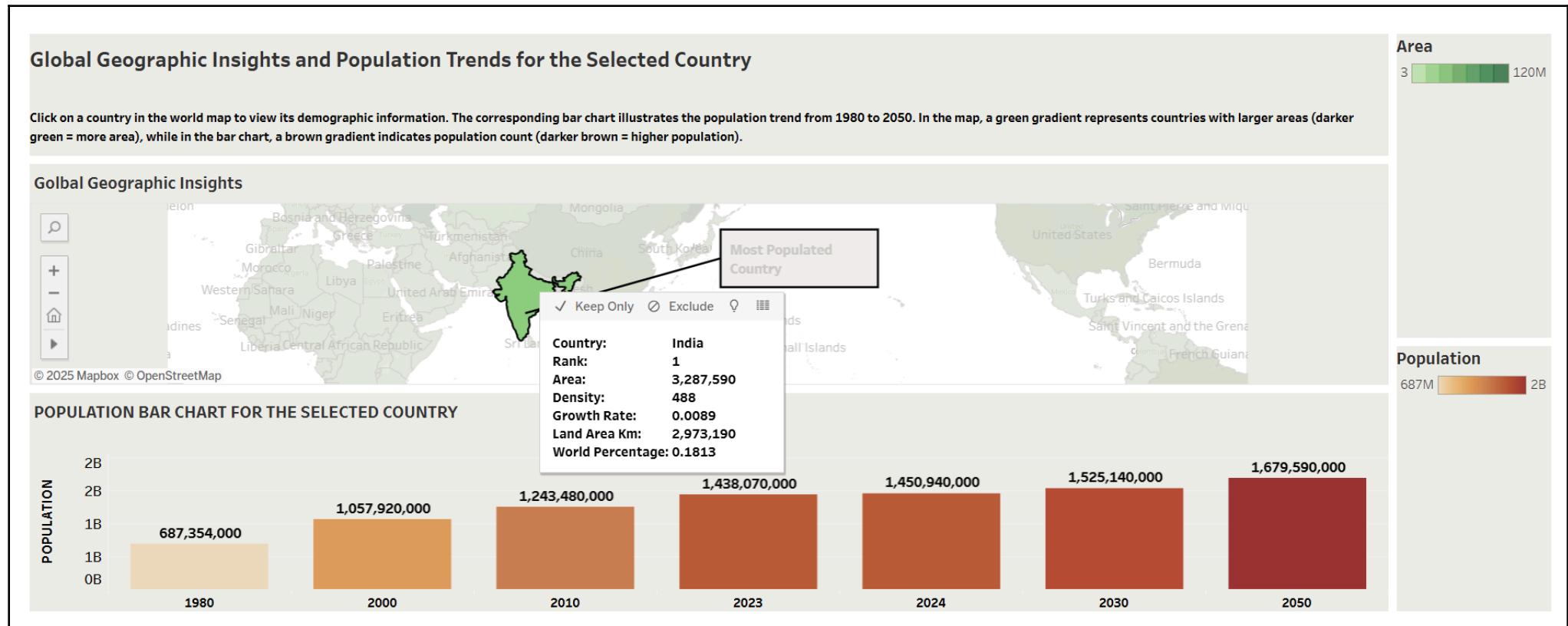
**Feedback Consideration and Proof of Implementation:** One of the reviewers suggested to use annotations to represent important ICBs, and I have implemented this accordingly.

#### 4. Visualisation-4

##### (i) Global Geographic Insights and Population Trends for the Selected Country



##### (ii) Global Geographic Insights and Population Trends for the Selected Country (when the country selected is India)



(Click [here](#) for the Interactive Visualisation on Tableau Public)

(A) Dataset: [countries-population EA](#) (Row 4, Dataset Option 2)

(B) Visualisation Type: Geographic Map and Bar Chart

(C) Display Medium: The above visualisation can be published on global population data platforms like <https://population.un.org/dataportal>, [World Bank Open Data](#), [Our World in Data](#), and [Worldometer](#). It can also be used in government statistical portals and university research platforms for demographic analysis.

(D) Purpose: The visualisation is aimed at aiding policy making, analysis, research, development, and planning. It can help decision-makers and researchers understand key demographic metrics of a country and make informed decisions for future planning.

(E) Message Conveyed: The visualisation conveys information on key demographic metrics such as **country, population rank, area, density, growth rate, land area, and world percentage**. It also shows the population count of a selected country from **1980 to 2050**.

(F) Target Audience:

- Demographic researchers and analysts
- Policymakers and government officials
- Urban and regional planners
- Economists and development experts

- Educational institutions and researchers in population studies

#### (G) Design Choices:

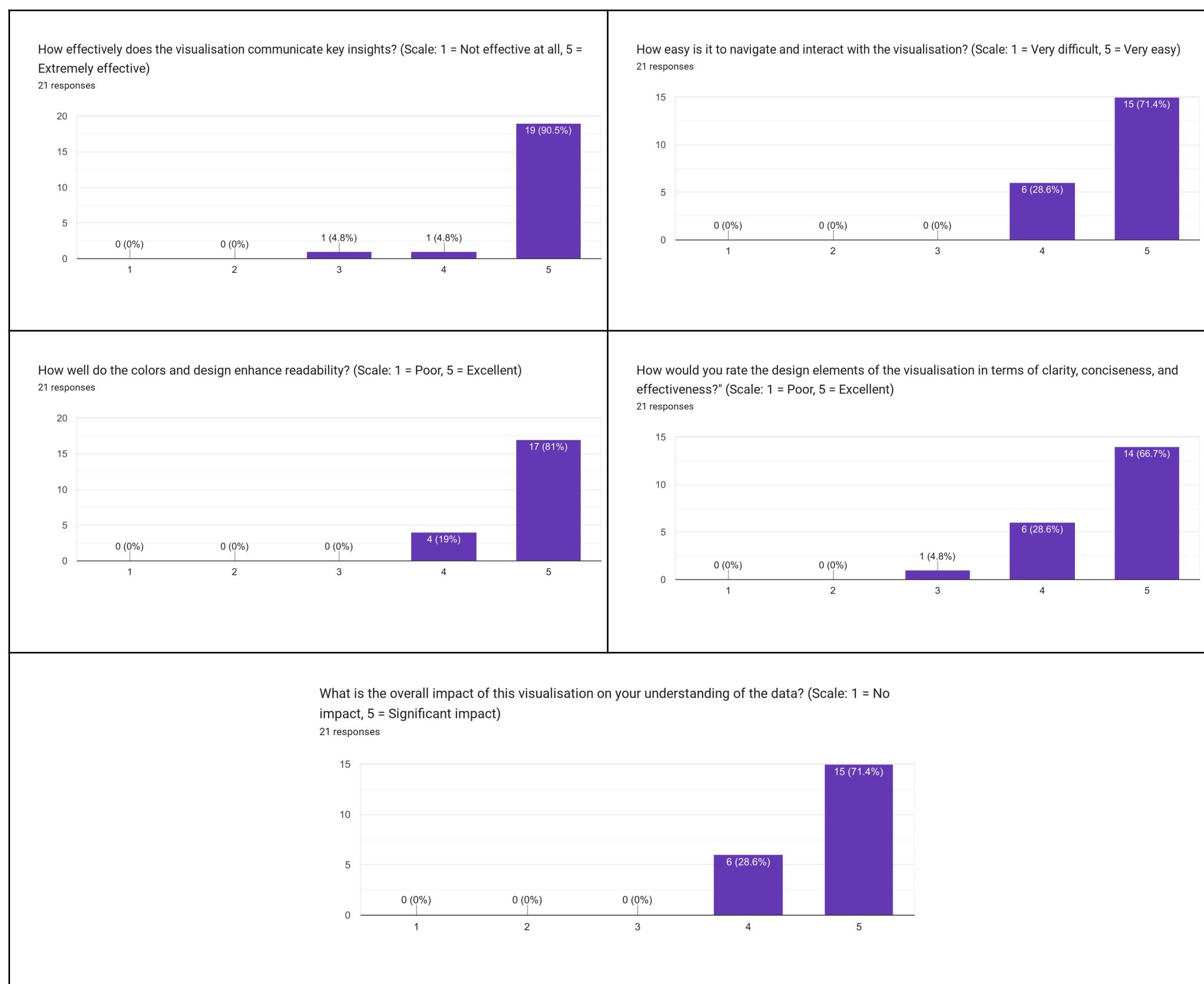
- **Attractiveness:** A gradient of green shades (light to dark) is used on the map to represent varying areas where darker greens indicate higher area. This is used to create a visually appealing contrast and to draw attention to larger countries. A gradient of brown shades is used on the bar chart to indicate population count of different years where darker brown represents higher population count of the selected country in the given year. (Becker, 2024)
- **Usability:** The combination of a world map and bar chart is used for an interactive exploration of population data. The map enables users to easily hover over countries for demographic information and the bar chart offers a straightforward way to compare population trends over time for a selected country.
- **Readability:** Clear country names, bold headings, and intuitive legends are used to enhance the visualisation's readability. Tooltips are used to provide additional context without cluttering the display, helping users to quickly grasp key information. (Chip, 2022)

#### 4C Aspects: (Data Practices, n.d.)

- **Clean:** A simple and less complicated designs are used to ensure easy user interface.
- **Clear:** The target audience and the message being conveyed are clearly defined and effectively communicated.
- **Concise:** The visualisation focuses mainly on key demographic metrics—**country, population rank, area, density, growth rate, land area, world percentage and population count** of the selected country, this avoids unnecessary overload of information.
- **Captivating:** The use of color gradients, bold text, and a structured layout is used to draw people's attention and engagement.

**(H) Additional Design Elements:** Hovering over each country shows details like: **country, population rank, area, density, growth rate, land area, world percentage and population count** bar chart of the selected country.

**(I) Impact & Proof of Impact:** A survey of 21 people were conducted and the below questions were asked related to the visualisation. The x-axes of the below graphs represent the ratings and the bars represent the number and percentage of people who gave the particular rating.

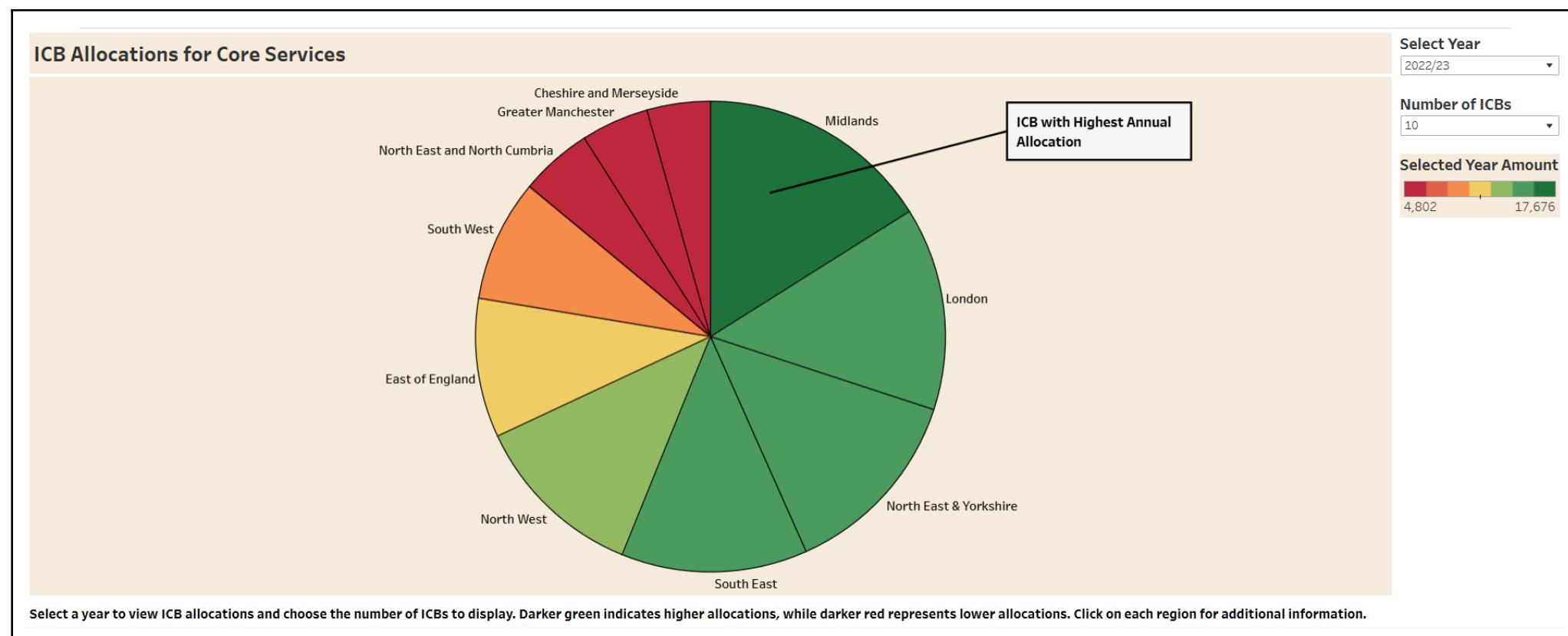


[Click to see Google Form Responses](#)

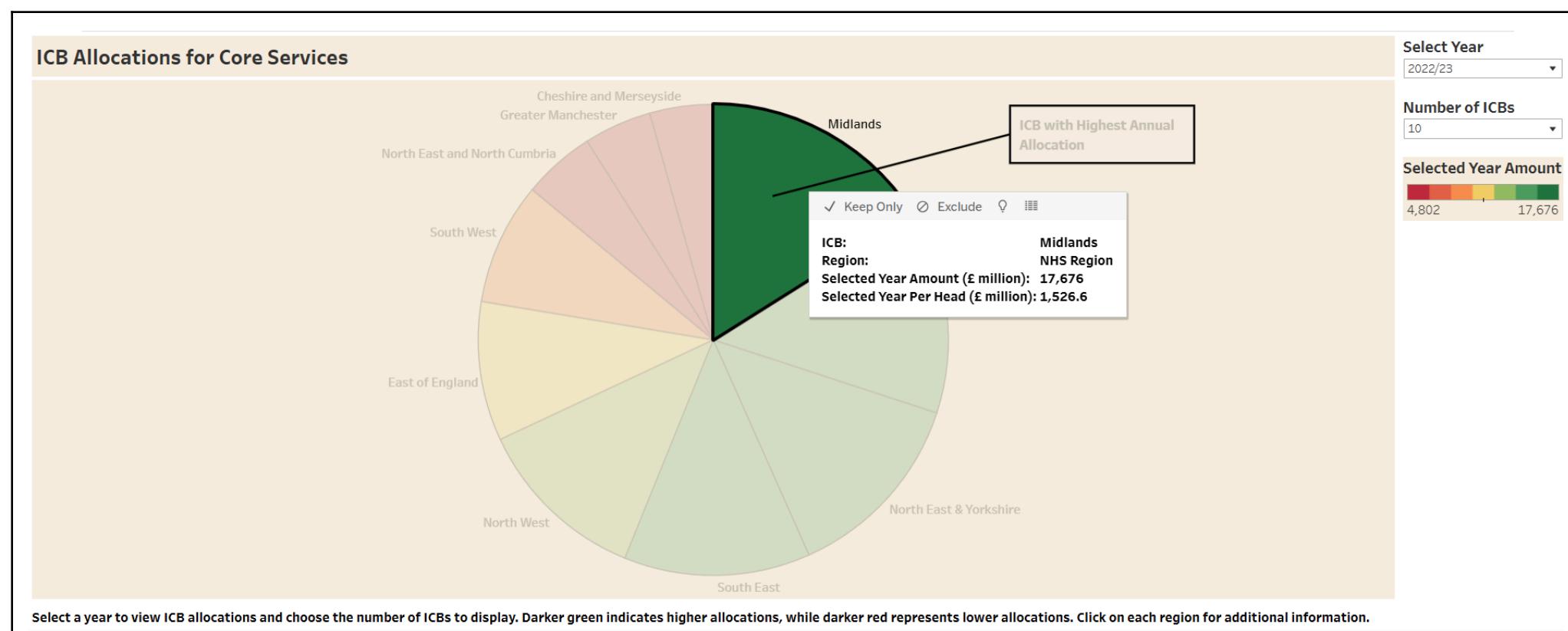
**Feedback Consideration and Proof of Implementation:** Initially, blue was used to represent both the maps and the bars. However, one of the reviewers suggested using different color gradients for each. Based on this feedback, separate color gradients have now been applied to distinguish the bars and the maps effectively.

## 5. Visualisation-5

### (i) ICB Allocations for Core Services



### (ii) ICB Allocations for Core Services (Screenshot taken with Tooltip)



(Click [here](#) for the Interactive Visualisation on Tableau Public)

(A) Dataset: [CBP ICB Allocation 2022- 2025 EA](#) ( Row 5, Dataset Option 2)

(B) Visualisation Type: Pie Chart (Tableau, n.d.)

(C) Display Medium: The above visualisation can be published digitally on [NHS Digital](#), [UK Government Open Data \(data.gov.uk\)](#), [WHO Data Repository](#) etc for healthcare funding and analysis.

(D) Purpose: The main purpose of this visualisation is to support policy-making and analysis by visualising ICB funding for core services across different regions in order to aid informed decisions on regional funding and proper resource allocation of funds.

(E) Message Conveyed: The visualisation conveys information on ICB allocations for core services both overall and per head by highlighting funding amounts across different regions.

(F) Target Audience:

- Healthcare policymakers and government officials
- ICB managers
- Regional healthcare planners
- Healthcare economists and financial analysts
- Researchers and analysts in healthcare funding

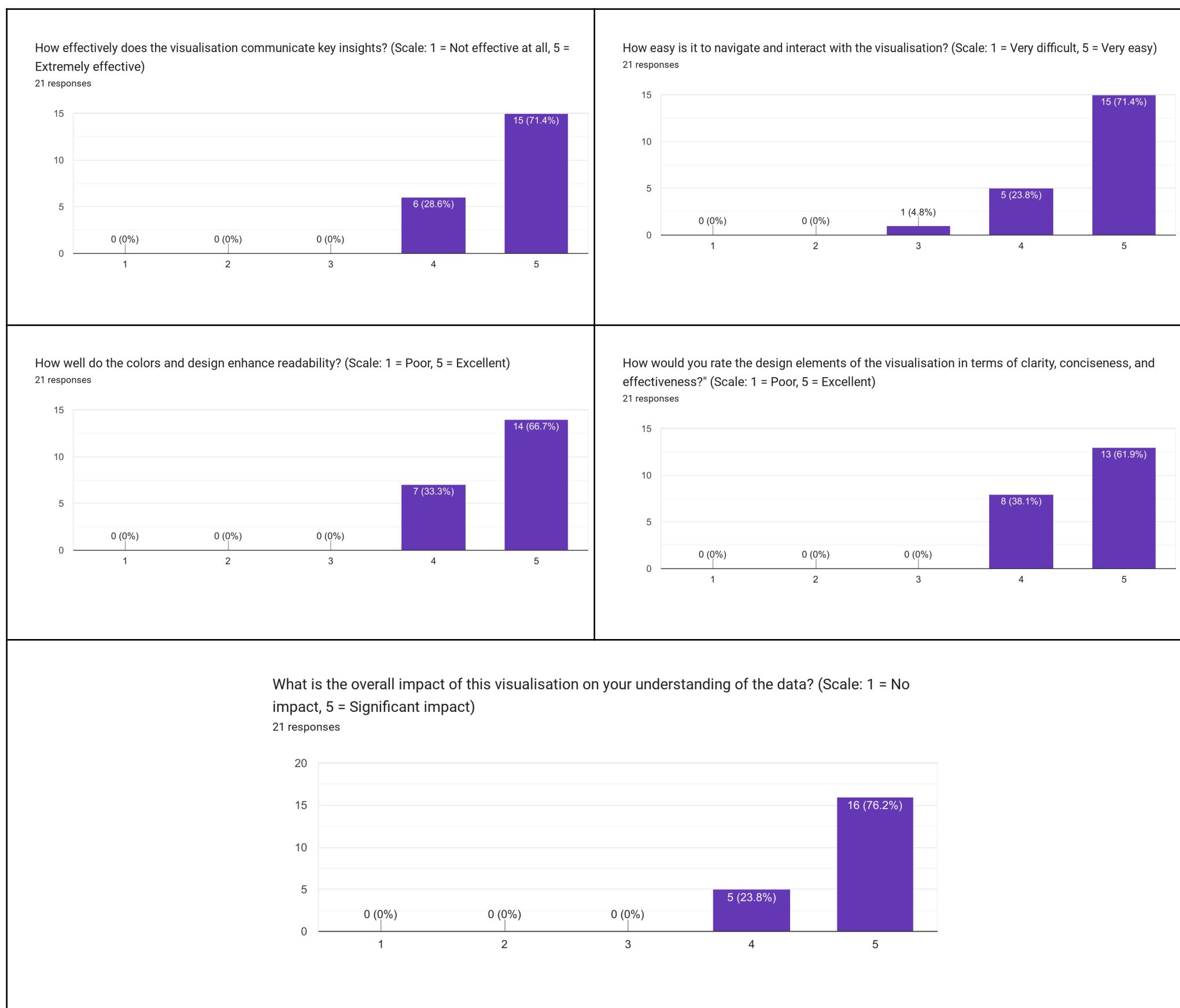
**(G) Design Choices:**

- Attractiveness:** A gradient of green to red is used in the pie chart to visually represent varying ICB allocations for core services. Darker green indicates higher funding while darker red represents lower funding. This color contrast is visually engaging and draws attention to regions with significant funding differences. (Becker, 2024)
- Usability:** The pie chart allows users to select different years and adjust the number of ICBs displayed. The tooltips provide additional details such as ICB, Region, Selected Year Amount (£ million) and Selected Year Per Head (£ million).
- Readability:** Clear ICB names, bold headings, interactive parameters and intuitive legends are used to enhance the visualisation's readability. Tooltips are used to provide additional context without cluttering the display helping users to quickly grasp key information. (Chip, 2022)

**4C Aspects:** (Data Practices, n.d.)

- Clean:** A simple design and a straightforward pie chart is used with some interactive elements for easy user experience.
- Clear:** The target audience and the message being delivered are clearly defined and well communicated.
- Concise:** The visualization focuses on essential information related to ICB funding, such as overall and per-head allocations, avoiding unnecessary overload of data.
- Captivating:** The use of green and red color gradients, along with a structured layout, captures attention and effectively highlights funding differences across regions.

**(H) Impact & Proof of Impact:** A survey of 21 people were conducted and the below questions were asked related to the visualisation. The x-axes of the below graphs represent the ratings and the bars represent the number and percentage of people who gave the particular rating.

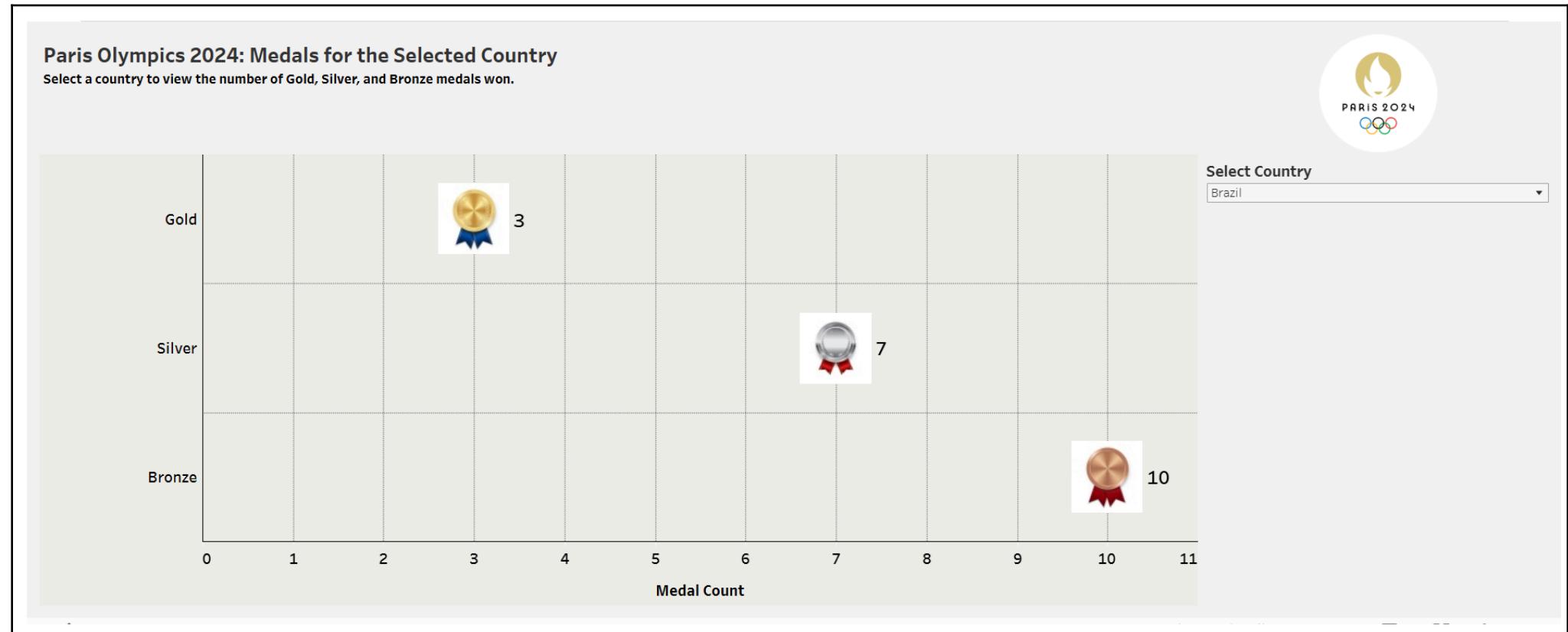


[Click to see Google Form Responses](#)

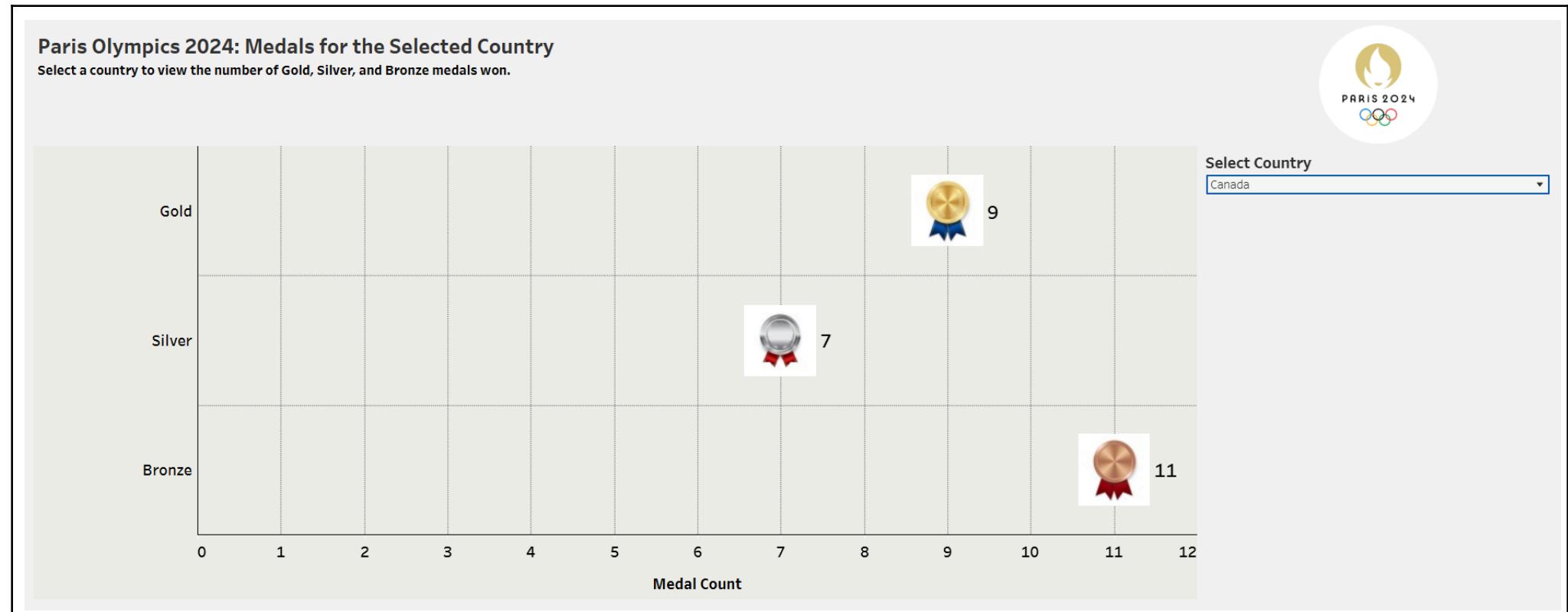
**Feedback Consideration and Proof of Implementation:** Initially, the pie chart was static and displayed only five ICBs. Based on user feedback, it has been made interactive, allowing users to select the number of ICBs they want to view.

## 6. Visualisation-6

### (i) Paris Olympics 2024: Medals for the Selected Country (Selected Country is Brazil)



### (ii) Paris Olympics 2024: Medals for the Selected Country (Selected Country is Canada)



(Click [here](#) for the Interactive Visualisation on Tableau Public)

**(A) Dataset:** Alan, B. (2024). *Paris 2024 Olympics Medals* [Data set]. Kaggle.

<https://www.kaggle.com/datasets/berkayalan/paris-2024-olympics-medals>

**(B) Justification of Choosing the Above Dataset:** The Paris 2024 Olympics Medals dataset is chosen because the Olympic Games are one of the most popular and significant events in the world. This dataset allows users to easily compare the performance of different countries that participated and learn about their overall rankings by getting insights into the number of medals (Gold, Silver, and Bronze) won by each country.

**(C) Visualisation Type:** Pictogram (Trivedi, 2024)

**(D) Display Medium:** The above visualisation can be published on official Olympics website ([olympics.com](https://olympics.com)), International Olympic Committee website ([olympic.org](https://olympic.org)), sports news portals like [ESPN](https://espn.com) and [BBC Sport](https://bbc.com/sport).

**(E) Purpose:** The main purpose of this visualisation is to help users gain instant insights into the number of medals (Gold, Silver, and Bronze) won by each country, assisting analysts in evaluating country performances in the Paris Olympics 2024.

**(F) Message Conveyed:** The visualization displays the number of Gold, Silver, and Bronze medals won by each country in the Paris Olympics 2024, along with their overall rank compared to other countries

**(G) Target Audience:**

- Sports analysts
- Olympic enthusiasts
- Journalists and media professionals
- Government and sports officials

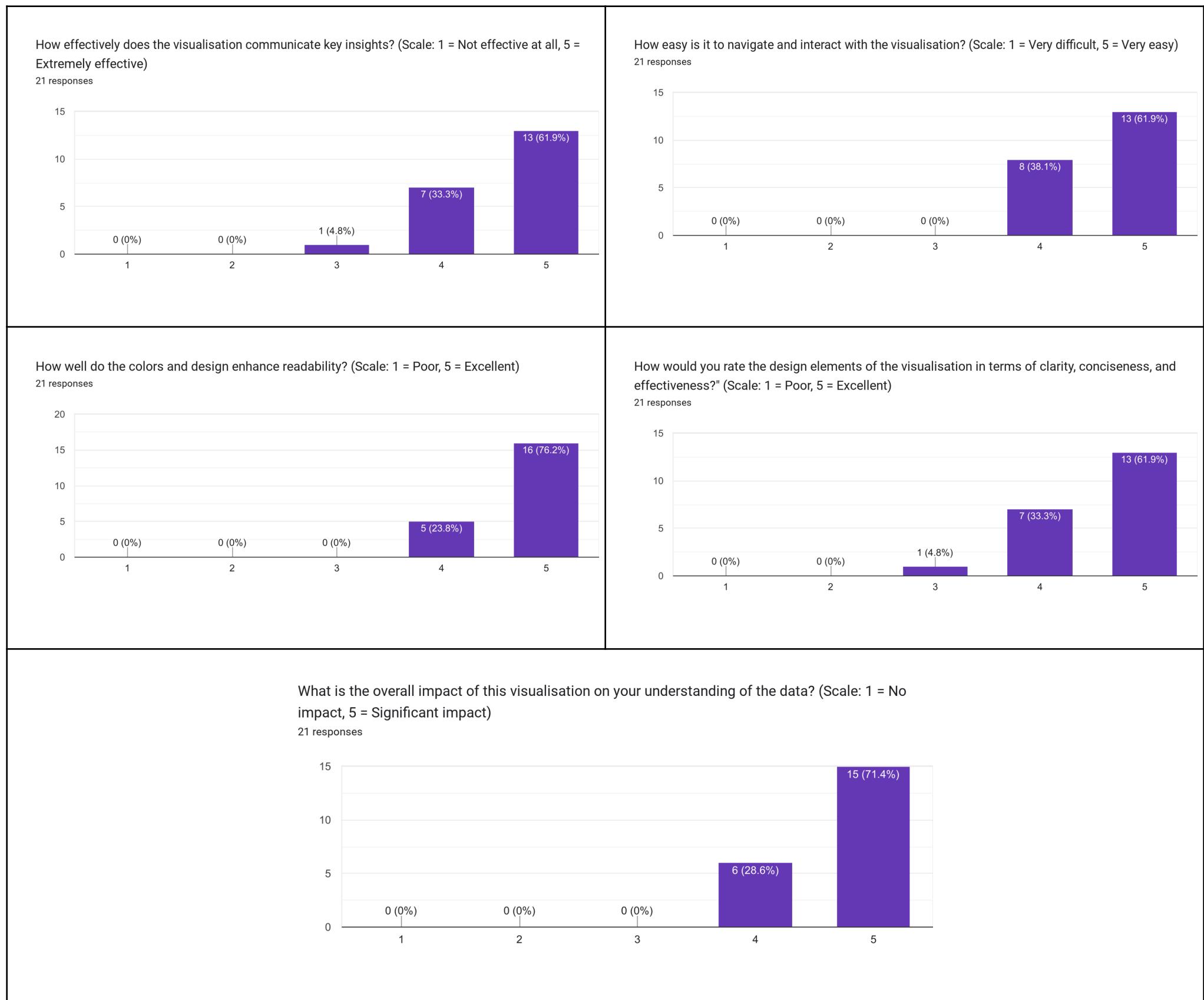
#### (H) Design Choices:

- **Attractiveness:** The use of medal images (Gold, Silver, Bronze) makes the visualisation attractive and easy to understand at a glance.
- **Usability:** The visualisation allows users to select a country and instantly view its Gold, Silver, and Bronze medal counts.
- **Readability:** Clear country names, bold medal labels, and intuitive icons enhance the readability of the visualisation. Interactive features and tooltips are used to provide details such as medal counts and rankings. (Chip, 2022)

#### 4C Aspects: (Data Practices, n.d.)

- **Clean:** A simple design is used with some interactive elements for a smooth user experience.
- **Clear:** The target audience and the message being conveyed are clearly defined and effectively communicated.
- **Concise:** Main focus is given on key data: Gold, Silver, and Bronze medals, avoiding unnecessary details.
- **Captivating:** The bright medal images and distinct colors make the visualization engaging and visually striking.

**(H) Impact & Proof of Impact:** A survey of 21 people were conducted and the below questions were asked related to the visualisation. The x-axes of the below graphs represent the ratings and the bars represent the number and percentage of people who gave the particular rating.



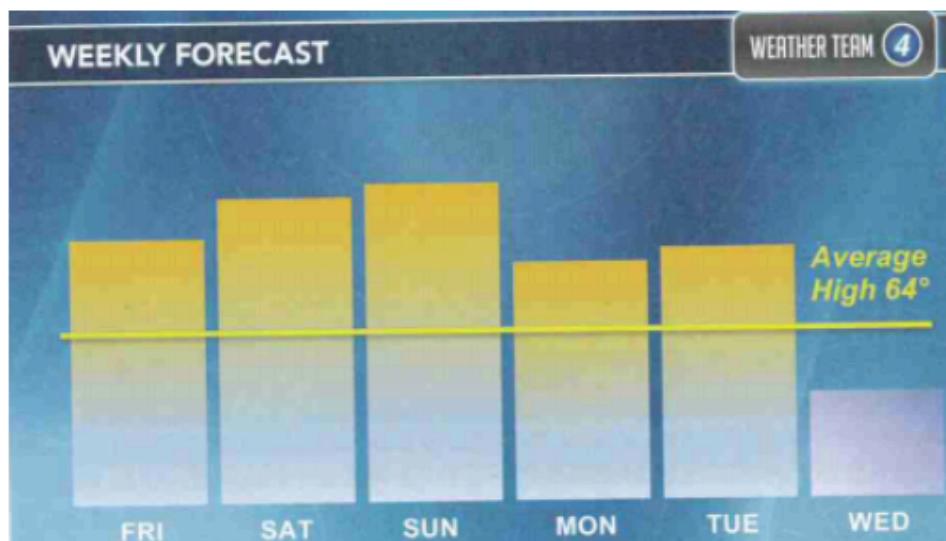
[Click to see Google Form Responses](#)

**Feedback Consideration and Proof of Implementation:** Initially, the numbers were not visible alongside the medal images. Based on the review feedback, numbers have now been assigned alongside the images to enhance instant readability.

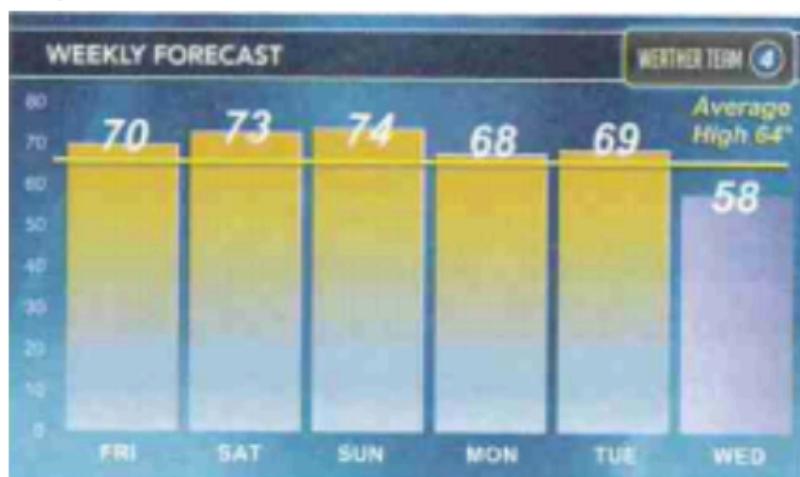
## 7. Identification of “Bad” Visualisation

I identify the below visualisation from the class materials as a “Bad” visualisation.

Graph1:



Graph 2:



### Reference of the above Visualisation:

University of Portsmouth. (2025). *Workshop group task: declutter diagrams (Task 3, Graph 1 & Graph 2)* [Data Visualisation and Exploratory Analytics (2024/25), Week 8]. Moodle. <https://moodle.port.ac.uk/course/section.php?id=566327>

### Reasons why the visualisation is inappropriate:

1. In both the graphs (Graph 1 & Graph 2), the record for “Thursday” is missing making it an incomplete portrayal of information to the audience.
2. The starting day in both the graphs (Graph 1 & Graph 2) is Friday which is really awkward because generally “Monday” is considered as the first day of the week (according to ISO 8601).
3. In graph 1, there is no y-axis, this makes the graph incomplete and makes it difficult for the audience to identify the exact temperature.
4. In both the graphs (Graph 1 & Graph 2), the unit of temperature is not mentioned (eg, degree celsius or degree fahrenheit), this will let audience interpret temperatures in different units or scales.
5. There is no legend in both the graphs (Graph 1 & Graph 2) to explain the audience about the meaning of the colors used in the bars.
6. In both the graphs (Graph 1 and Graph 2), the color gradient used to represent temeperatures is not prominent and doesn't contrast properly. The color should be used in such a way that the audience can easily distinguish between the colder and warmer temperatures, for example prominent blue to represent the colder temperatures and bright yellow to represent the warmer temperatures.
7. Lastly, and most importantly, the graphs lack specific dates and years, providing only vague information about the temperature. Displaying only the day of the week is insufficient and incomplete.

## References

1. Saxena, S. (2024, February 23). *Create dual axis charts in Tableau*. Analytics Vidhya.  
<https://www.analyticsvidhya.com/blog/2021/03/create-dual-axis-charts-in-tableau/>
2. Becker, L. (2024, December 28). *How to use color to highlight key data in charts and graphs*. Color Theory Explained.  
<https://colortheoryexplained.com/how-to-use-color-to-highlight-key-data-in-charts-and-graphs/>
3. ChartExpo. (n.d.). *Dual-axis charts: A complete guide*. ChartExpo. <https://chartexpo.com/blog/dual-axis-charts>
4. Chip. (2022). *Designing charts: Ensuring maximum readability*. QuantHub.  
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[https://datapractices.org/courseware/2\\_5.html?print-pdf&showNotes=true](https://datapractices.org/courseware/2_5.html?print-pdf&showNotes=true)
6. Tableau. (n.d.). *Build a treemap*. Tableau Help. [https://help.tableau.com/current/pro/desktop/en-us/buildexamples\\_treemap.htm](https://help.tableau.com/current/pro/desktop/en-us/buildexamples_treemap.htm)
7. Learnist.org. (n.d.). *Harnessing the power of data visualization with treemap charts*.  
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