

Paris 2024 Olympics Medals

Exploratory Data Analysis of medals won in 2024



Safaa ALLAMY

20.08.2024

INTRODUCTION	3
DATA COLLECTION, QUALITY AND SUMMARY STATISTICS	4
Key features of the dataset	4
Data Quality	5
Summary Statistics	5
Summary Statistics	5
Observations	6
EXPLORATORY DATA ANALYSIS (EDA)	7
Descriptive Statistics	7
Visualizations	8
RESULTS AND INTERPRETATION	11
Key Findings and Insights	11
Interpretation	11
CONCLUSION	12
APPENDICES	13

INTRODUCTION

The Olympic Games, or Olympics, are the world's leading international sporting events. The Olympics feature summer and winter sports competitions in which thousands of athletes from around the world participate in various competitions. The most recent Olympic Games were the Paris 2024 Summer Olympics, held from 26 July to 11 August 2024, including 32 sports. Understanding the distribution of medals among countries provides valuable insights into the competitive landscape and leads to discussions regarding the global athletic performance.

This project focuses on conducting Exploratory Data Analysis (EDA) on a dataset summarizing the medals won for each participating country at the Paris 2024 Olympics. The primary objective of this analysis is to explore and visualize the data to identify key patterns in the distribution of medals per country. By leveraging the capabilities of Excel, the project aims to present clear and concise visualizations that highlight the most significant findings to be further discussed.

In the following sections, this report will describe the data used, detail the exploratory techniques used, and discuss the insights gained from the analysis.

DATA COLLECTION, QUALITY AND SUMMARY STATISTICS

For the purposes of this project, the dataset used is the **Paris 2024 Olympics Medals** sourced from [Kaggle](#). It includes all participating countries and covers data for the medals each country won.

Key features of the dataset

- **Number of records:** The dataset comprises 91 records, each representing a participating country in the Paris 2024 Olympics.
- **Variables included:**
 - **Rank:** This variable indicates the overall ranking of each country based on the total number of medals won.
 - **Country:** The name of the country that participated in the Paris 2024 Olympics. This variable identifies the nation that the medals were attributed to (e.g., France, Italy, Canada).
 - **Country code:** A three-letter abbreviation representing the country (e.g., FRA for France, ITA for Italy, CAN for Canada). This variable is used as a standardized identifier for each country.
 - **Gold:** The number of gold medals won by the country. Gold medals represent first-place finishes in various Olympic events.
 - **Silver:** The number of silver medals won by the country. Silver medals are awarded to athletes or teams that finish in second place.
 - **Bronze:** The number of bronze medals won by the country. Bronze medals are awarded to those who achieve third place in their respective events.
 - **Total:** The sum of gold, silver, and bronze medals won by the country. This variable provides an overall count of all the medals won by the country during the Paris 2024 Olympics.

Data Quality

The dataset is clean and well-structured, with *no missing values* and *no duplicates*. Two (2) minor inconsistencies were noted later during the analysis.

Summary Statistics

To provide a comprehensive overview of the dataset, key summary statistics were calculated for the variables related to medal counts, as shown in the table below. These statistics help to understand the overall distribution of medals among participating countries.

Statistic	Value (Total)	Value (Gold)	Value (Silver)	Value (Bronze)
Minimum	1	0	0	0
Maximum	126	40	44	42
Average	11.42	3.60	3.59	4.22
Median	5	1	1	2
Standard Deviation	19.70	6.99	6.77	6.56
Count	1039	328	327	384

Summary Statistics

- **Total number of medals awarded:**
 - Gold: 328
 - Silver: 237
 - Bronze: 384
 - Total: 1039
- **Average number of medals per country:**
 - Gold: 3.60
 - Silver: 3.59
 - Bronze: 4.22
 - Total: 11.42
- **Maximum number of medals won by a single country:**
 - Gold: 40
 - Silver: 44

- Bronze: 42
 - Total: 126
- **Minimum number of medals won by a single country:**
 - Gold: 0
 - Silver: 0
 - Bronze: 0
 - Total: 1
- **Median number of medals per country:**
 - Gold: 1
 - Silver: 1
 - Bronze: 2
 - Total: 5

Observations

The dataset shows that the distribution of medals is heavily skewed, with a few countries winning a large number of medals while many countries won fewer than 10 medals.

The United States emerged as the top-performing country, with the highest number of medals across all categories, for the fourth time in a row as per the research done outside of the dataset.

EXPLORATORY DATA ANALYSIS (EDA)

The Exploratory Data Analysis (EDA) section provides a detailed examination of the dataset through various statistical measures and visualizations. This analysis aims to uncover patterns, trends, and relationships within the data.

Descriptive Statistics

To start the EDA, descriptive statistics were calculated to summarize the central tendencies and dispersion of medal counts across countries.

- Gold Medals: The mean number of gold medals per country is 3.60, with a standard deviation of 6.99.
- Silver Medals: On average, countries won 3.59 silver medals, with a standard deviation of 6.77.
- Bronze Medals: The mean number of bronze medals is 4.22, with a standard deviation of 6.56.
- Total Medals: On average, countries won 11.42 medals in total, with a standard deviation of 19.70.

The standard deviations for gold (6.99), silver (6.77), and bronze (6.56) medals indicate that there is considerable variation in the number of medals won by different countries.

The standard deviation for the total number of medals (19.70) is particularly high relative to the mean, indicating a wide disparity in overall performance. This large variation means that while some countries were highly successful, others had limited success, contributing to a broad range of total medal counts.

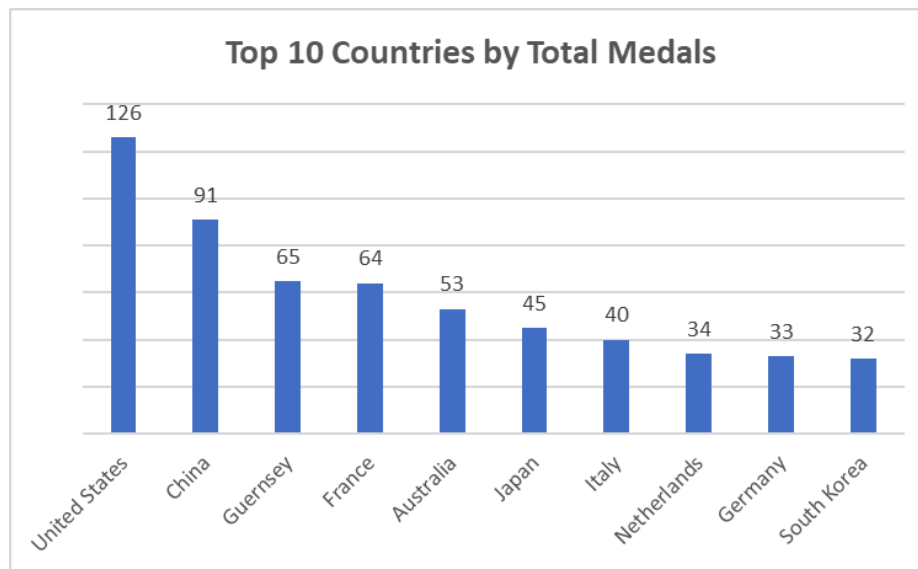
These statistics suggest that while the average number of medals per country is modest, there is significant variability in performance. The higher average and standard deviation for bronze medals could indicate that third-place finishes were more accessible to a broader range of countries, whereas gold and silver medals were more concentrated among the top-performing nations. The high standard deviation in total medals further underscores the disparity in Olympic success among the participating countries.

Visualizations

To better understand the data, several visualizations were created:

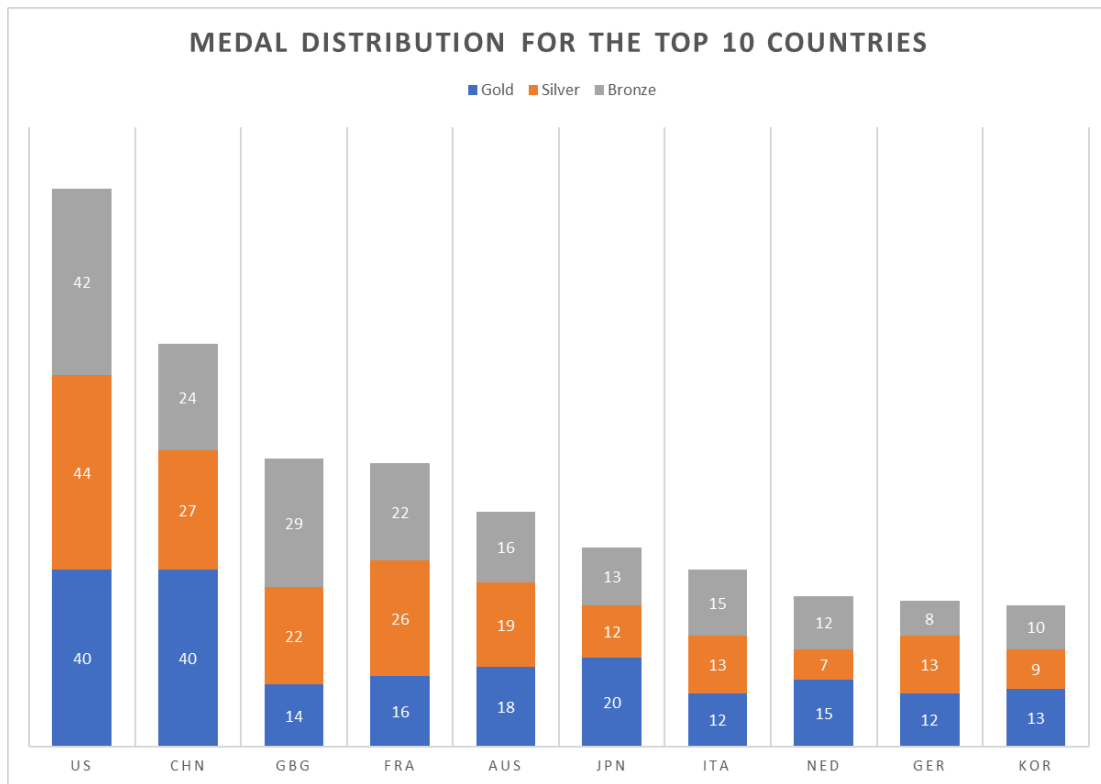
Top 10 Countries by Total Medals:

A horizontal bar chart was created to highlight the top 10 countries in terms of total medals won. This chart clearly shows the dominance of a few countries.



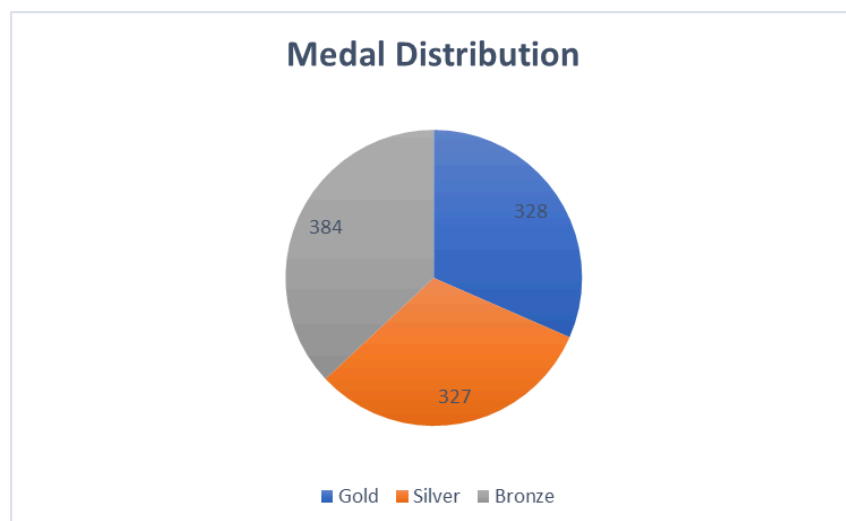
Medal Distribution for the top 10 Countries:

A stacked column chart was used to visually represent how each type of medal contributes to the total medals won by the top 10 countries retrieved from the previous horizontal bar chart.



Proportion of Medals by Medal Type:

A pie chart was used to visualize the proportion of gold, silver, and bronze medals awarded. The chart reveals that the distribution is relatively even across the three types of medals.

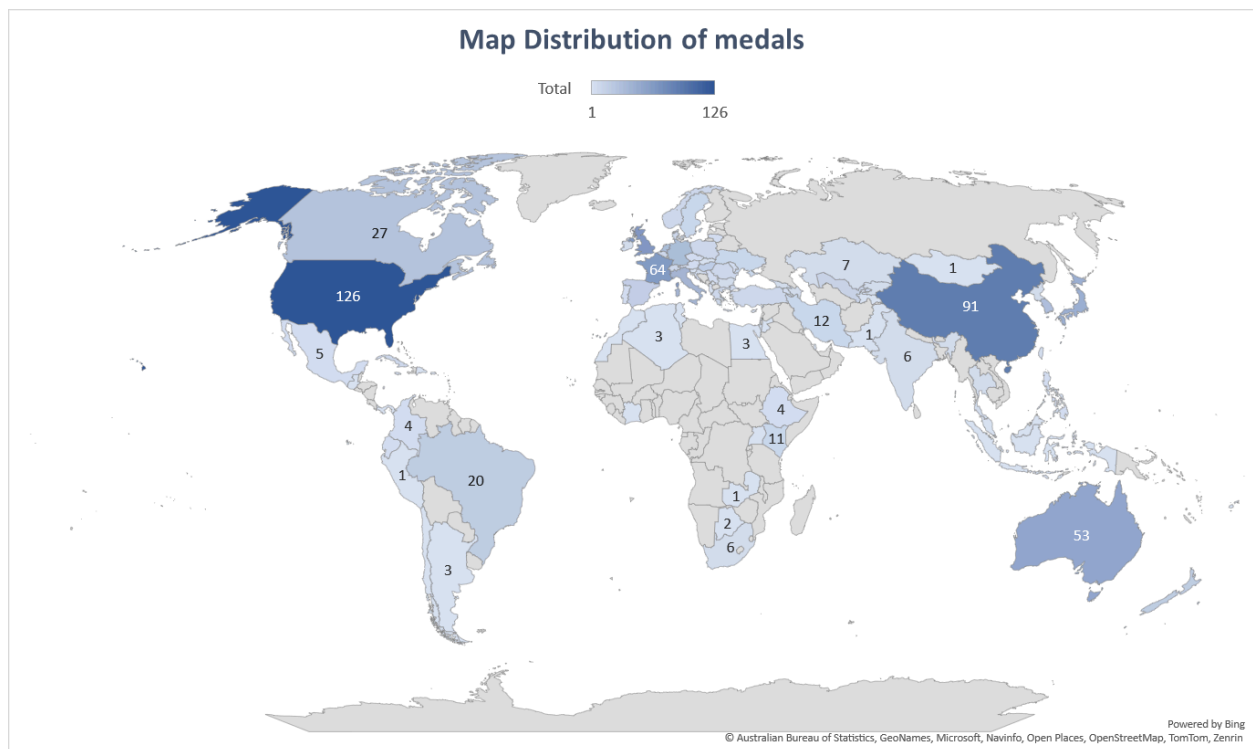


Map Distribution of Total Medals:

To better show the distribution of medals for all 91 participating countries, a map was created to highlight which regions and nations excelled at the Paris 2024 Olympics.

While creating all the maps for this analysis, two (2) minor inconsistencies were noticed:

- **Pakistan** had the wrong country code (*PKN*) which was changed to **PK**.
- Unfortunately, the **Refugee Olympic Team's code EOR** is not recognized in Excel or other contexts because it is not a code representing a specific country. Therefore, the data related to this entry is not shown on any of the maps.



RESULTS AND INTERPRETATION

The Results and Interpretation section summarizes the key findings from the EDA and provides context and interpretation for these results.

Key Findings and Insights

- **Dominance of Major Nations:** The USA and China were the first top medal-winning countries at the Paris 2024 Olympics, reflecting their continued investment in sports and athletic development. The USA, specifically, has historically performed well in the Olympics, and their dominance is predictable in the current dataset.
- **Medal Distribution across the world:** Apart from the two (2) top medal-winning countries, the most competitive ones, with opportunities to excel in sports, are mostly located in Europe. While these nations have won a significant number of medals, many of the remaining countries have had the chance at only winning a single medal.

Interpretation

The analysis of the medal distribution at the Paris 2024 Olympics provides valuable insights into the global landscape of sports. The EDA also uncovered regional trends, with countries in Europe and Asia performing particularly well. This may be attributed to a combination of factors, including economic resources, government support, and cultural emphasis on sports. The analysis has also revealed the undeniable dominance of the USA, not only in the recent Paris 2024 Olympics, but throughout the history of the Olympic Games. The high performance and success of certain nations highlights the impact of national sports programs and investments in training facilities, coaching, and athlete development.

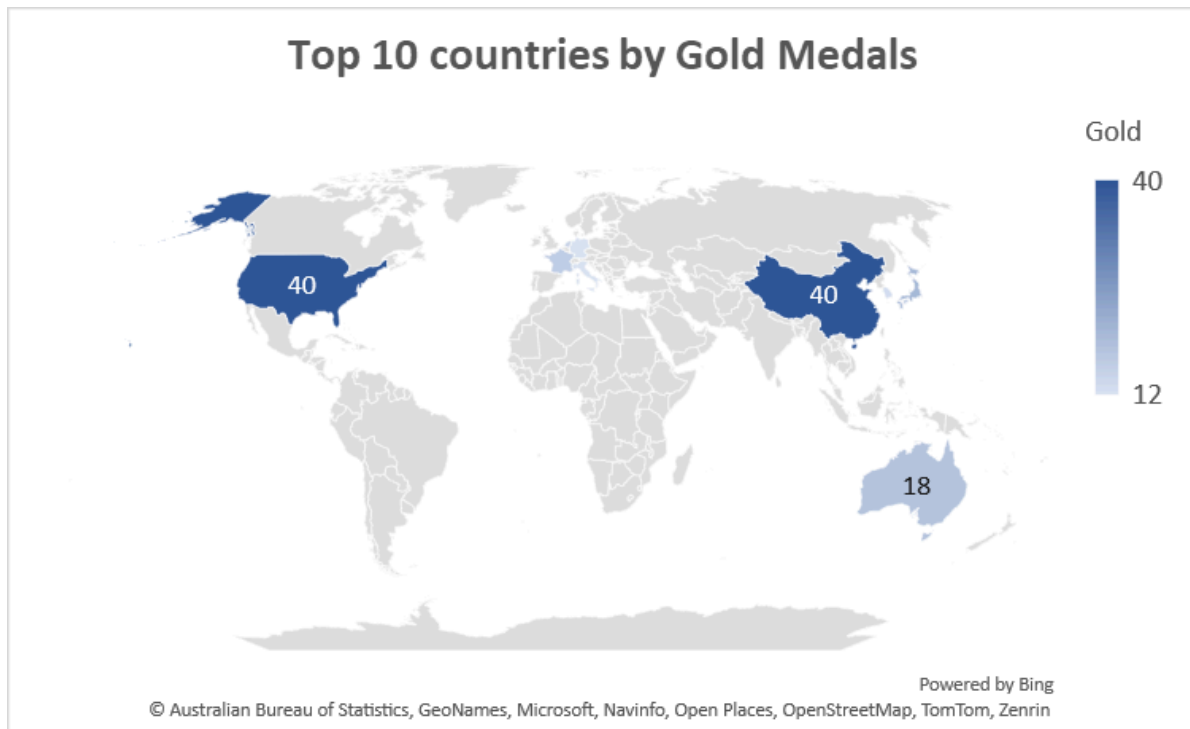
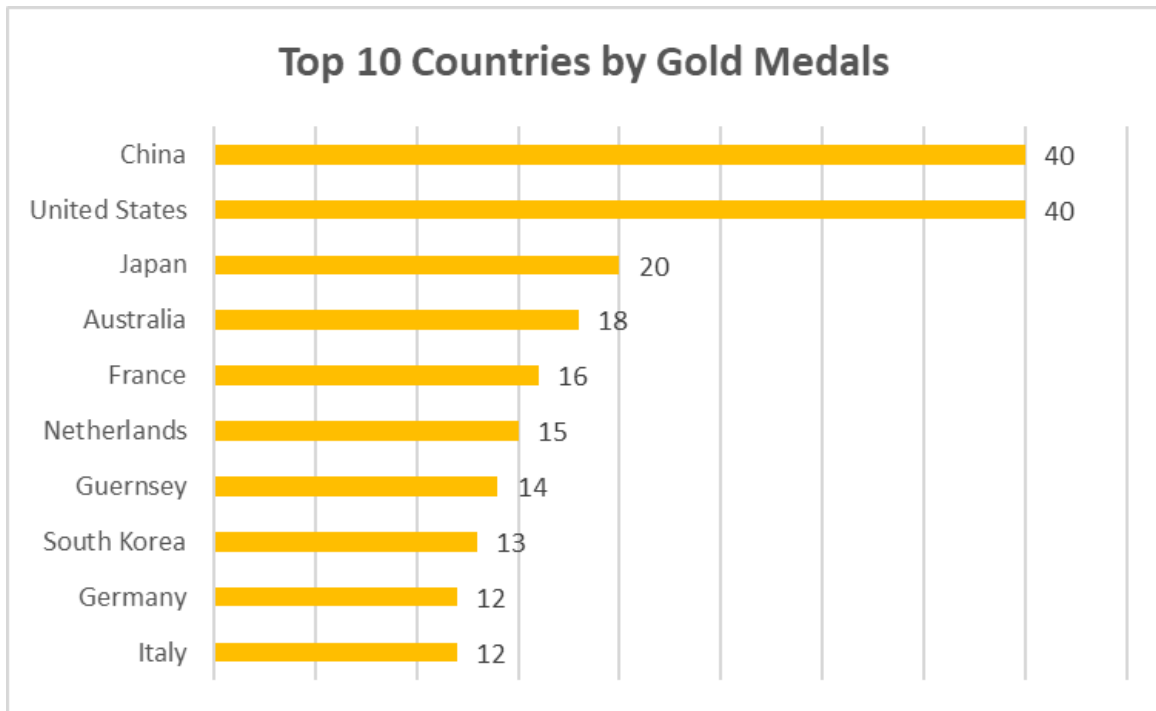
CONCLUSION

The analysis of the Paris 2024 Olympics Medals dataset provides valuable insights into the performance of medal-winning countries on the global stage. The results highlight the dominance of a few key nations, such as the United States and China, which collectively secured a significant proportion of the total medals awarded. This trend reflects the ongoing investment and focus on sports development in these countries, allowing them to maintain their competitive edge in the Olympics.

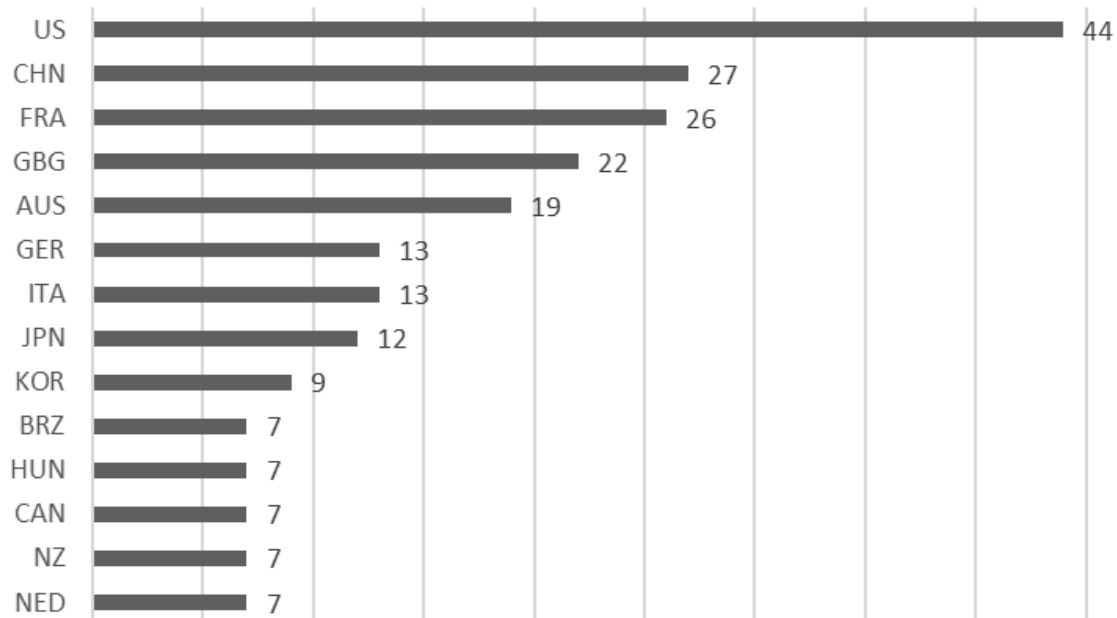
On another hand, the analysis also underscores the disparities in athletic success, with many countries securing only a small number of medals. This uneven distribution points to the varying levels of resources, infrastructure, and support available to athletes in different parts of the world.

In conclusion, while the Paris 2024 Olympics celebrated outstanding achievements in sports, the analysis emphasizes the need for continued efforts to support underrepresented nations and promote equitable opportunities for all athletes. Future research could explore the underlying factors contributing to these disparities, providing further insights into how the global sports community can work toward a more inclusive and balanced Olympic experience. More investigation, with much detailed data, could analyze the medal distribution between genders to enhance inclusivity in sports globally. It would also be interesting to analyze why certain regions or countries excel in specific sports could provide valuable insights into cultural, environmental, or educational factors that contribute to their success.

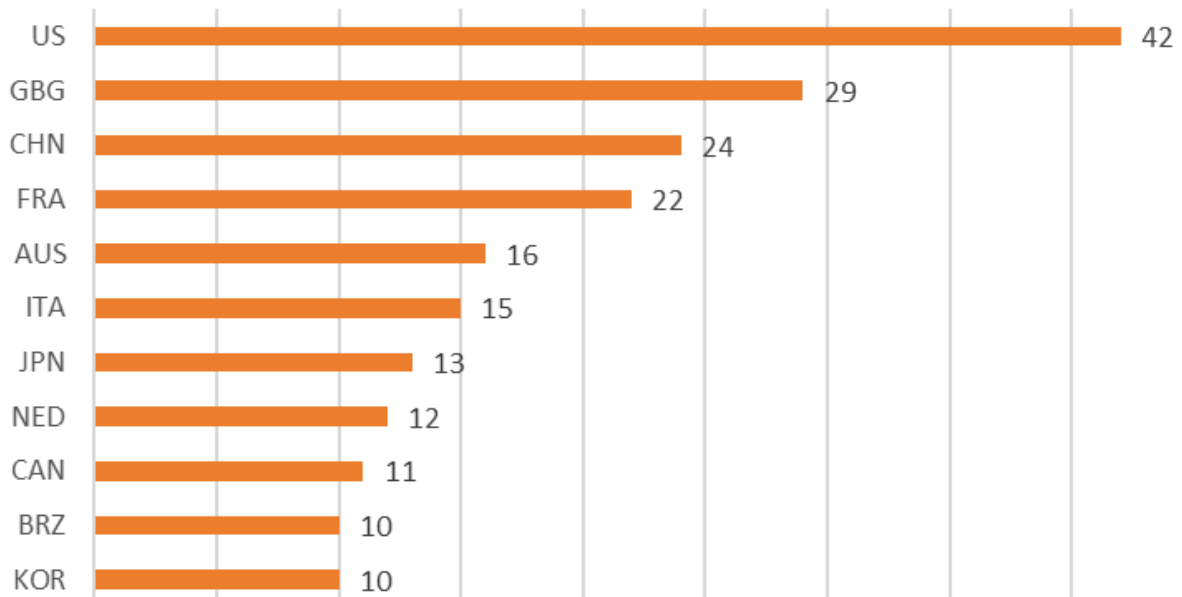
APPENDICES



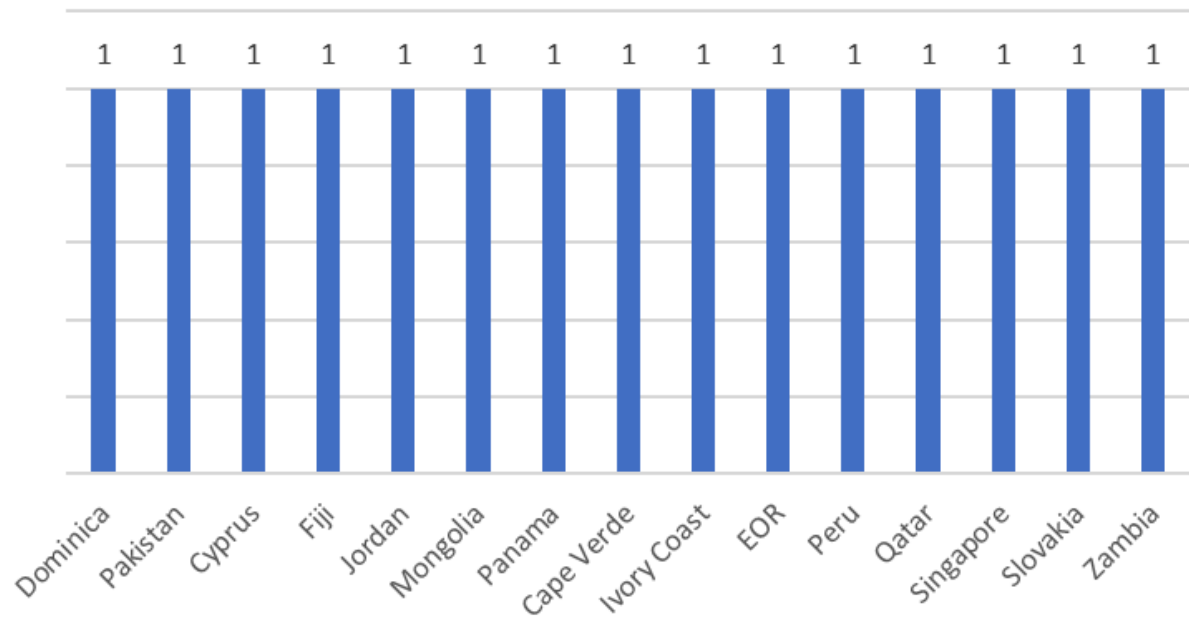
Top 10 Countries by Silver Medals



Top 10 Countries by Bronze Medals



Bottom 10 Countries by Total Medals



Map Distribution of overall last 10 countries

