Descriptive Statistics

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Mia Troiano

Main Descriptive Statistics

The main descriptive statistics I looked at were the frequency statistics, with the count of athletes representing each country and the count of medals that each country had. These were chosen to demonstrate which countries have been dominant in the Olympics in terms of representation as well as medaling. Other descriptive statistics were performed on the athlete demographic to see how the mean age, height, and weight changed over time, seeing as the ideal "Olympic athlete" physique and body type has changed throughout the years.

Key Points

Athlete Representation

Below is a visual breakdown of the athlete representation broken down by country and year of the games, in descending order from largest total representation. The dates from this data set range from the 1896 Summer games to the 2016 Summer games. This chart demonstrates that the 2000 Summer Olympics had the greatest overall representation, with 13,798 athletes in total. The countries with the greatest athlete representation throughout the entirety of the games were included in the colored breakdown, with the remaining countries grouped together.

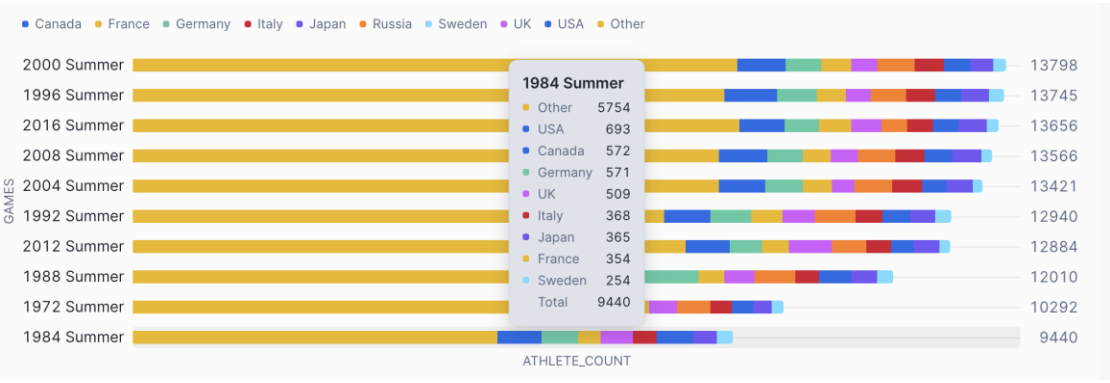

Figure 1. Bar chart demonstrating athlete representation by games, ordered by overall representation.

This next chart shows the same data, however now it is ordered by the year of the games. This chart shows the marked difference in representation between the winter and summer Olympic games.

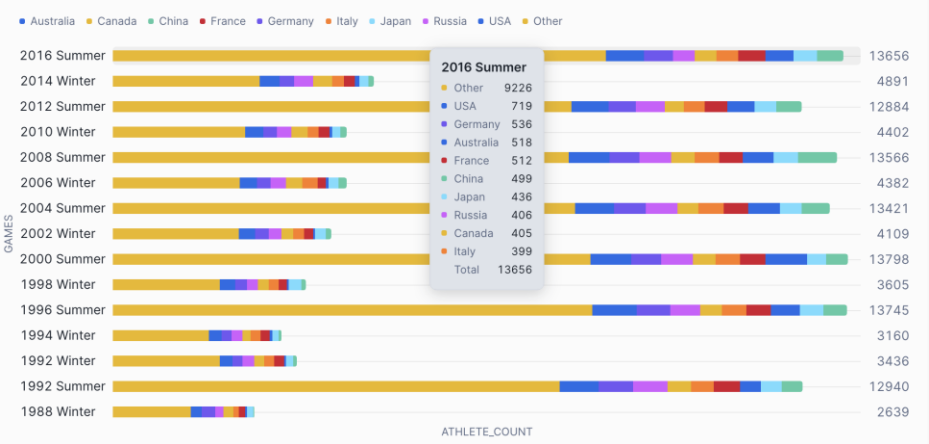

Figure 2. Bar chart demonstrating athlete representation by games, ordered by year of the games.

This chart demonstrates the total athlete representation from over 100+ years of both the Summer and Winter Olympics, with the top 15 countries displayed. The United States of America has nearly 3,000 more athletes in the games than the runner-up, Germany. Later, we will examine if this trend is similar to total medals won at the Olympic games.

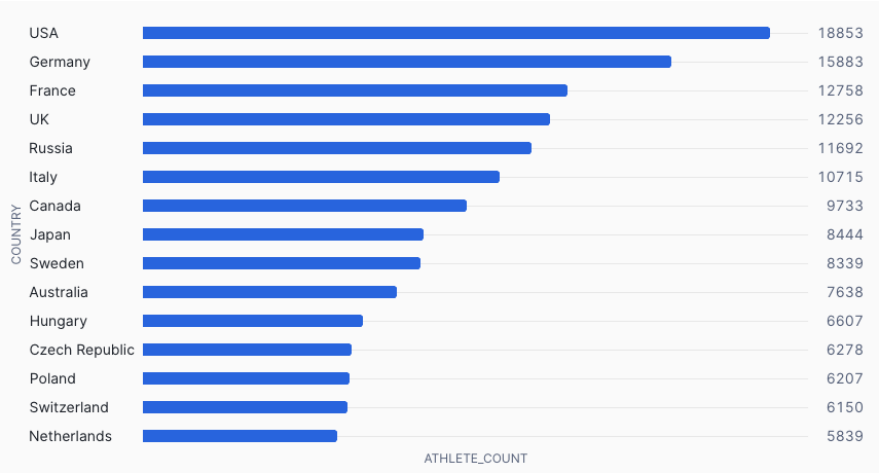

Figure 3. Bar chart demonstrating athlete representation by country, in descending order based on representation.

This table demonstrates the top 10 athlete representations per game broken down by country. This table shows that the USA had the greatest representation in a single games. However, the date of the games with the largest athlete representation is somewhat shocking, the 1904 Summer Olympics.

	COUNTRY	GAMES	ATHLETE_COUNT
1	USA	1904 Summer	1109
2	France	1900 Summer	1071
3	Germany	1972 Summer	1041
4	UK	1908 Summer	972
5	Germany	1988 Summer	918
6	Germany	1976 Summer	859
7	USA	1996 Summer	839
8	Australia	2000 Summer	788
9	Germany	1968 Summer	778
10	USA	2000 Summer	764

Figure 4. Table demonstrating athlete representation by country per games, in descending order based on representation.

Medal Count

The next main relationship examined was the overall medal count for each country. This chart demonstrates the breakdown of gold, silver, and bronze medals won over the 100+ years of the Olympic games. As you can see, the United States also has the most total medals won throughout this time, as well as the most gold medals.

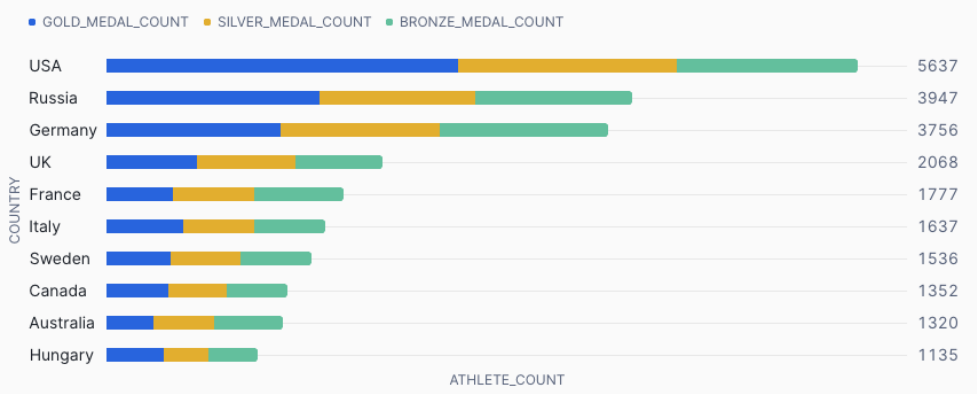

Figure 5. Bar chart demonstrating the breakdown of the total amount of gold, silver and bronze medals won by country during the Olympics, in descending order.

This next table demonstrates the numerical breakdown of the medals won by each country per Olympic games, in descending order from total medals won. Unlike the previous relationship that showed the USA having the most overall medals, Russia has the most medals won in a single games.

	COUNTRY	GAMES	TOTAL_MEDAL_COUNT	GOLD_MEDAL_COUNT	SILVER_MEDAL_COUNT	BRONZE_MEDAL_COUNT
1	Russia	1980 Summer	442	187	129	126
2	USA	1904 Summer	394	128	141	125
3	UK	1908 Summer	368	147	131	90
4	USA	1984 Summer	352	186	116	50
5	USA	2008 Summer	317	127	110	80
6	Russia	1988 Summer	300	134	67	99
7	Germany	1988 Summer	296	111	91	94
8	Russia	1976 Summer	286	114	95	77
9	Germany	1976 Summer	273	123	76	74
10	Germany	1980 Summer	264	115	88	61

Figure 6. Table demonstrating the breakdown of the amount of gold, silver and bronze medals won by country broken down by individual games, in descending order based on total medals won.

This next table displays the exact same data as the previous table; however now it is ordered by the gold medals won. This table shows that Russia won the most total medals, as well as the most gold medals, in the 1980 Summer games. However, the remainder of the breakdown is not the same, as countries can have more gold medals but less overall medals. This chart also shows that Russia, the US, and the UK are the countries who have won the most gold medals in a single Olympic game.

	COUNTRY	GAMES	TOTAL_MEDAL_COUNT	GOLD_MEDAL_COUNT	SILVER_MEDAL_COUNT	BRONZE_MEDAL_COUNT
1	Russia	1980 Summer	442	187	129	126
2	USA	1984 Summer	352	186	116	50
3	USA	1996 Summer	259	159	48	52
4	UK	1908 Summer	368	147	131	90
5	USA	2012 Summer	248	145	57	46
6	USA	2016 Summer	264	139	54	71
7	Russia	1988 Summer	300	134	67	99
8	USA	2000 Summer	242	130	61	51
9	USA	1904 Summer	394	128	141	125
10	USA	2008 Summer	317	127	110	80

Figure 7. Table demonstrating the breakdown of the amount of gold, silver and bronze medals won by country broken down by individual games, in descending order based on gold medals won.

Athlete Demographics

The next variables that were examined were the average athlete's demographics, including age, height, and weight. Below is a chart that shows the breakdown of the average athlete age over time. Through visual examination of the entire chart below, it seems that the average age of the athletes was slightly older in the early years of the Olympics, which normalizes around the mid 1950s and does not change much after then. The chart also shows that the mean age for males is slightly older than for the females, which is seen in

almost all years of the games. It should be noted that there were no females in the 1896 Olympic games.

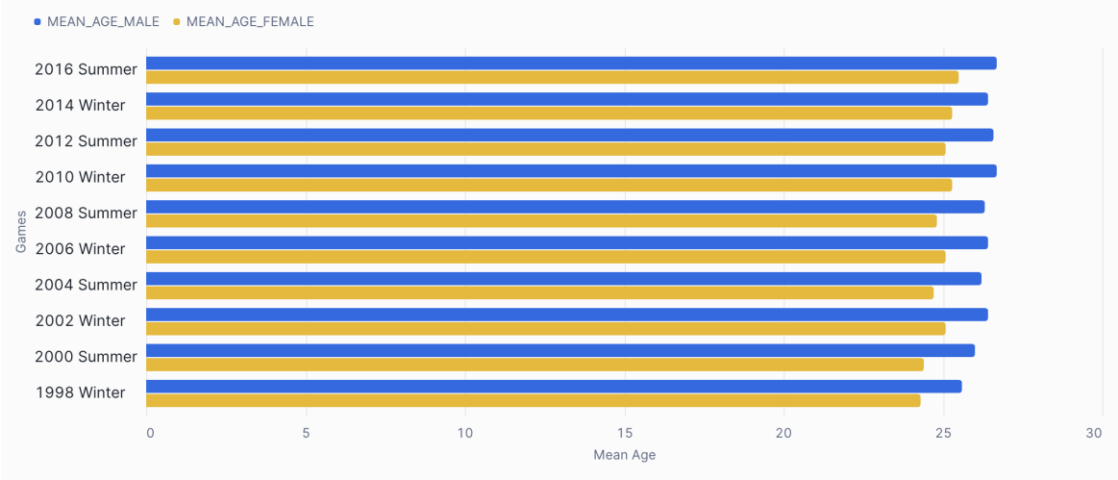

Figure 8. Bar chart demonstrating the breakdown of athlete age in the latest 10 Olympic games.

Similar trends can be seen for the average height and weight of the Olympic athletes (Figure 9 & 10). The charts below are in descending order based on weight or height, respectively, and there is minimal difference throughout the years. Similar to the age variable, women in the Olympics are on average shorter and weigh less than the men, which is a constant trend seen throughout the years of the Olympics.

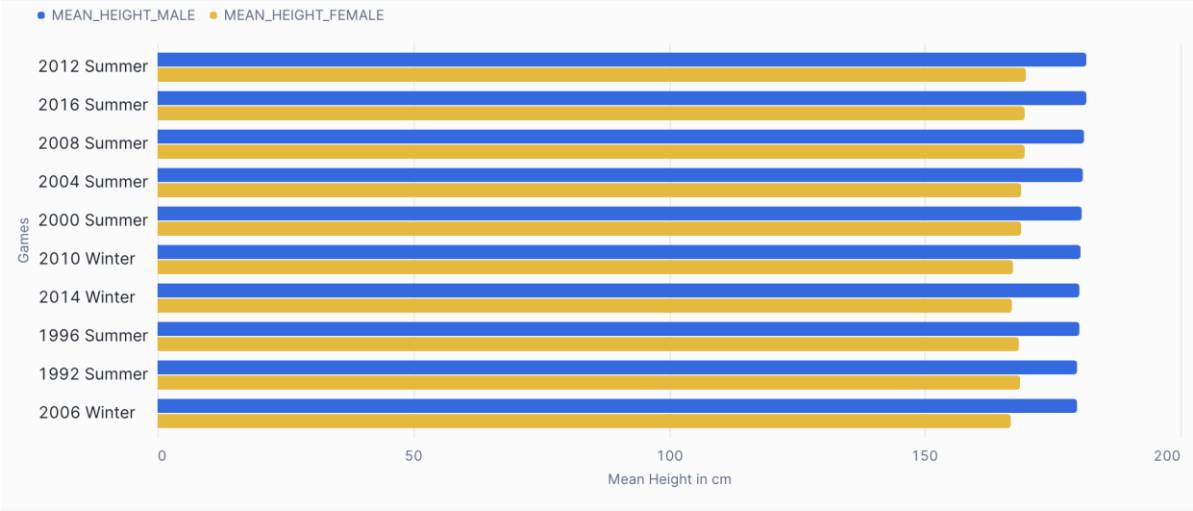

Figure 9. Bar chart demonstrating the breakdown of average athlete height for men and women, in descending order.

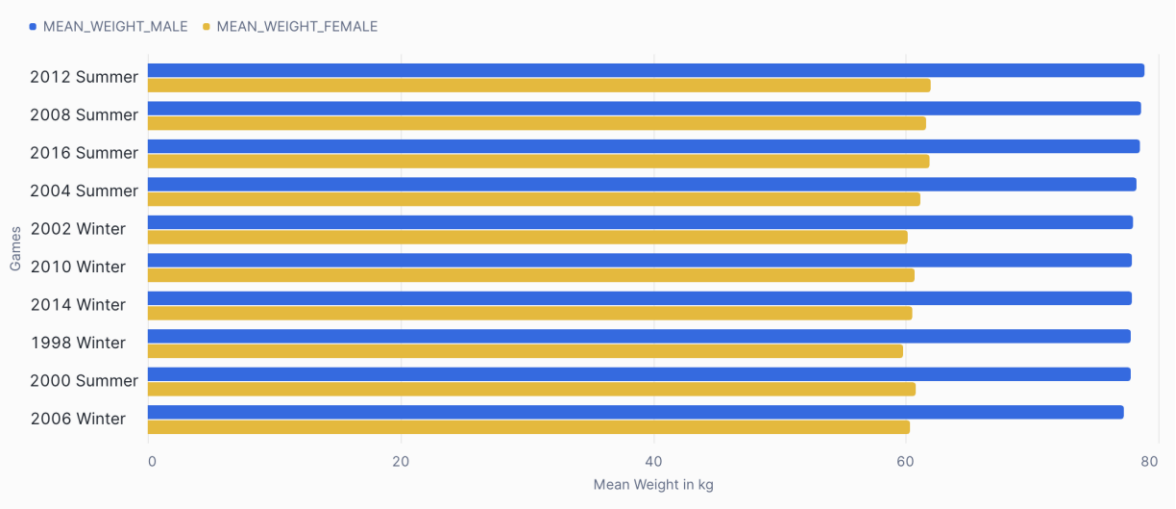

Figure 10. Bar chart demonstrating the breakdown of average athlete weight for men and women, in descending order.

Hypotheses

My initial hypothesis was that the US, Russia and China would have the most representation in the latter years of the Olympic games, which was somewhat true. The charts above demonstrate that the US had the most representation, however Russia is 5th on the total representation (Figure 3 & 4). I had hypothesized that European countries would dominate the athlete representation in the early years, however the USA had the most representation in 1904, so that hypothesis was also disproven. If I wanted to investigate this hypothesis a little deeper, I could section the years of the games into decades and analyze the athlete representation over decades to determine the trends.

My second hypothesis was similar to my first hypothesis, with the European countries dominating the total medal count in the initial years but the United States and China having more medals in the latter games. Analysis showed that this hypothesis is somewhat true, however the USA and Canada had some of the highest medal counts starting in 1904. Additionally, China was not one of the countries with the highest medal counts, which disproves my hypothesis. Figure 5 shows that the United States has won the most medals by ~1500. Further analysis of this hypothesis could break down the medal count per country separating the Winter and Summer Olympics.

My third hypothesis was in regard to the average age, height, and weight of the Olympic athletes. I hypothesized that age would decline, height would increase, and weight would decrease over the years of the games, which would demonstrate a more ideal Olympic physique. However, these variables stayed relatively constant throughout the years. Further statistical analysis could be done to see if there is a statistical significance identifying a difference that does not appear at first glance.

Additional Questions

As stated in the previous section, there are many further questions that could be investigated with further analysis. These questions include breaking down the data for each variable by Winter and Summer Olympics to see if differences exist. This could also be done by breaking up the years by decade to further analyze the year differences between the variables. Another analysis that could occur is the success rate of each country in the Olympics, which would be the quotient of the total medal count per athlete representation. However, this analysis would need to consider that a single athlete can win multiple medals, which would need to be accounted for in the final calculation. Further analysis can be performed on the country's performance in certain events and sports, with a count of the total medals/gold medals won in each sport.