Analyzing Titanic Survival Rates by Gender

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Background

The sinking of the Titanic on April 15, 1912, remains one of the deadliest maritime disasters in history. Of the approximately 2,224 passengers and crew on board, only about 710 survived (Gleicher, 2018). Historical records suggest that survival was influenced by various factors, including gender, social class, and age. The "Women and Children First" policy, widely followed during evacuations, implies a gender-based survival advantage (Frey et al., 2011). This study examines whether gender significantly impacted survival rates on the Titanic, utilizing historical passenger data to determine statistical differences in survival outcomes (Titanic Dataset, 2025).

Key Question/Objective

The primary question this study aims to answer is: Did gender influence survival rates on the Titanic? The hypothesis asserts that women had a higher survival rate than men due to the "Women and Children First" policy. This hypothesis is falsifiable because it can be tested using survival data from the Titanic. If statistical analysis shows no significant difference in survival rates between genders, the hypothesis would be disproven. Understanding this relationship is useful for analyzing historical emergency response behaviors and non-obvious factors influencing survival beyond gender alone, such as class and age (Hall, 1986).

Methods and Data

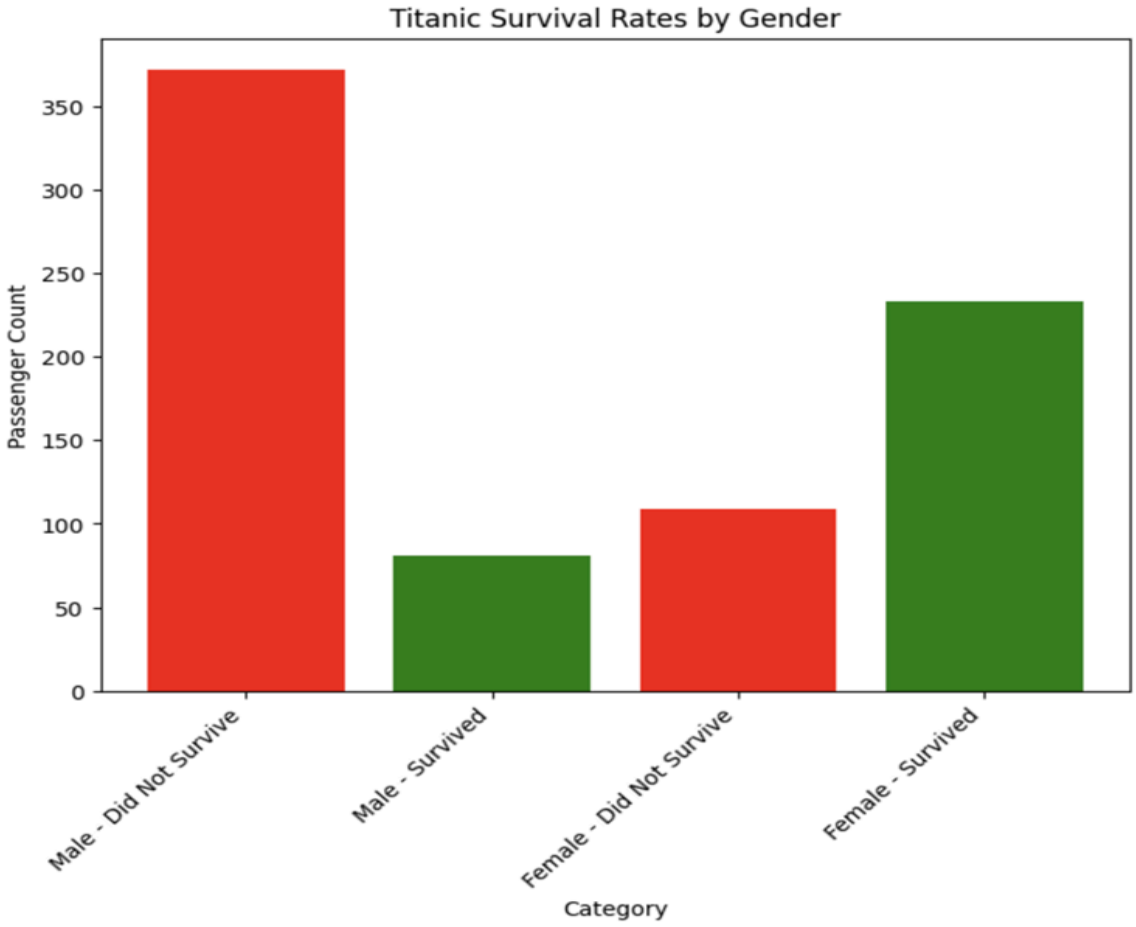
The dataset used contains information on Titanic passengers, including gender, age, class, fare paid, and survival status (Titanic Dataset, 2025). Missing data was handled by either imputing median values for numerical fields or removing rows where survival status was unavailable. Outliers were not removed, as

all data points represent actual passengers. The analysis groups data by gender and calculates survival percentages. The statistical method used is a chi-square test for independence to determine whether gender and survival rate are significantly related. Since multiple comparisons are being made, a Bonferroni correction was applied. Additionally, a bar chart is used to visualize survival proportions by gender. The chi-square test provides an objective measure of association, ensuring the analysis is data-driven and statistically sound (McPherson, 2001).

Results

The results indicate a significant disparity in survival rates between men and women. Among female passengers, approximately 74% survived, compared to only 19% of male passengers. The chi-square test yielded a p-value less than 0.001, indicating that the difference in survival rates between genders is statistically significant. A bar chart visualization clearly illustrates the survival rate gap between men and women. These findings support the hypothesis that gender played a crucial role in survival outcomes.

Figure 1: Bar chart of survival rates by gender



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Discussion and Broader Context

The findings align with historical accounts of the Titanic evacuation, where women and children were prioritized for lifeboats (Gleicher, 2018). This policy reflects broader societal norms of the early 20th century, where traditional gender roles influenced emergency responses. However, the data also suggests that class played a role—first-class women had a higher survival rate than those in lower classes, highlighting socio-economic disparities in survival chances (Frey et al., 2011). Understanding these factors provides insights into modern disaster response policies and social biases in crisis situations. Future research could explore how similar trends appear in contemporary evacuations (Hall, 1986).

References

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