

# STATISTICAL ANALYSIS REPORT: FIFA WORLD CUP GOALS

Project: Scoring Comparison (Men's vs. Women's) <sup>1</sup>Analyst: Jorge C. <sup>2</sup>Date: December 2025

## 1. Introduction

The objective of this analysis is to evaluate whether there is a statistically significant difference in the average goals scored per match between Men's and Women's FIFA World Cups<sup>4</sup>. To ensure data relevance and reflect the evolution of professional sports, the study is limited to matches played after January 1, 2002<sup>5</sup>.

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## 2. Methodology

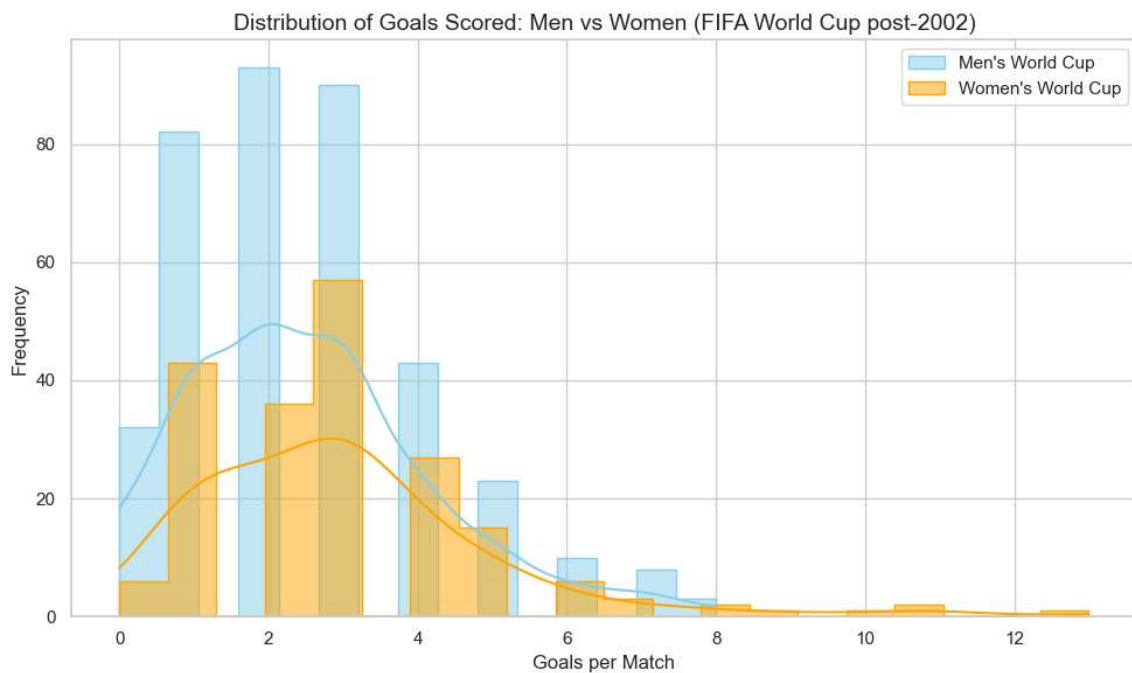
- **Data Sources:** Historical datasets men\_results.csv and women\_results.csv<sup>6</sup>.
- **Applied Filters:** Only matches corresponding to the "FIFA World Cup" were included<sup>7</sup>.
- **Statistical Test:** The **Wilcoxon-Mann-Whitney** test (non-parametric) was used, as the distribution of goals does not follow a normal bell curve<sup>8</sup>.
- **Hypotheses:**
  - **H0 (Null Hypothesis):** The number of goals scored in women's matches is equal to that of men's<sup>10</sup>.
  - **H1 (Alternative Hypothesis):** The number of goals scored in women's matches is greater than that of men's<sup>11</sup>.

## 3. Statistical Results

After processing the filtered data and executing the test via the pingouin library, the following critical values were obtained: <sup>12</sup>

- **Calculated P-Value:** 0.0051 <sup>13</sup>
- **Significance Level ( $\alpha$ ):** 0.01 (1%)

#### 4. Data Visualization



**Chart Interpretation:** <sup>1</sup>The histogram shows that men's matches have a high frequency of low scores (1-2 goals), while women's football presents a distribution with a higher presence in the 3 to 5-goal range, suggesting a more offensive trend.

#### 5. Conclusion

Since the p-value (0.0051) is strictly lower than the established significance level (0.01), there is sufficient statistical evidence to reject the null hypothesis<sup>17</sup>.

**Final Verdict:** It is confirmed that the average number of goals in the Women's World Cup is significantly higher than in the Men's World Cup for the analyzed period (2002-2022)