Do Pitch Counts Matter In The Major League Baseball?

Date: March 15, 2021

Presenter: Cynthia Crafter

To reduce the increasing overuse injuries and to extend the career of starting pitchers, more MLB teams have limited the number of pitches that a pitcher will throw in a game. . The theory is that, over time, reducing the number of throws will preserve the pitcher's arms and improve the number of wins, ERA, and quality starts

This analysis evaluated pitchers (minimum of 20 starts) and at least 10 years in the majors from 2005- 2019. The purpose was to determine if pitch count limitations improve starting pitcher statistics or should teams consider other contributing factors.

1

MLB are experiencing overuse injuries which causes teams to turn to minor league pitchers

As of 2017, 64% of all injuries were pitcher injuries. Multiple injuries can force a team to rely on young, inexperienced players who are not prepared for the majors

2

Overuse can diminish a pitcher's performance even if it does not cause injury.

The average starting pitcher salary is 6.2M. An elite pitcher can get salaries 30M+. The inability of a star pitcher to win games can affect team standings, attendance, and therefore, revenues.

3

Pitchers are usually the most expensive players

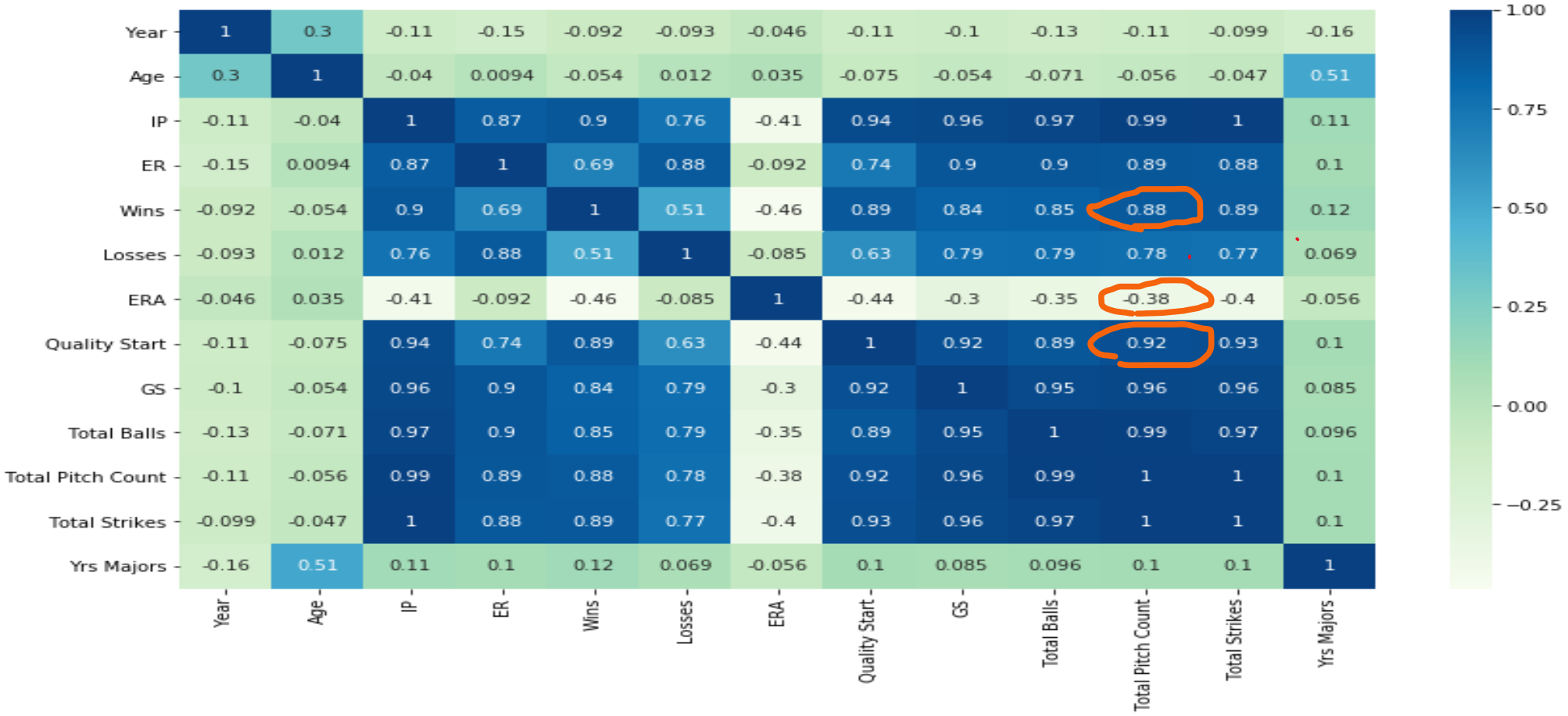
The average starting pitcher starts 32 games. At 6.2M average salary, each missed start cost a team approx. 194,000. Smaller markets are more affected because they have smaller payrolls.

Source: NewYork.cbslocal.com- MLB Pitching Injuries 2017

The correlation heatmap shows relationship between three key performance metrics (Wins, Quality Starts, ERA) in dataset and pitch count.

Two of the key pitcher metrics (Wins and Quality Starts) have a strong positive correlation with pitch count (.88 and .92 respectively).
ERA has a moderate negative correlation (-.38) with pitch count, which means pitchers with higher pitch counts have lower ERAs.
No indication that pitch counts negatively affect performance metrics.

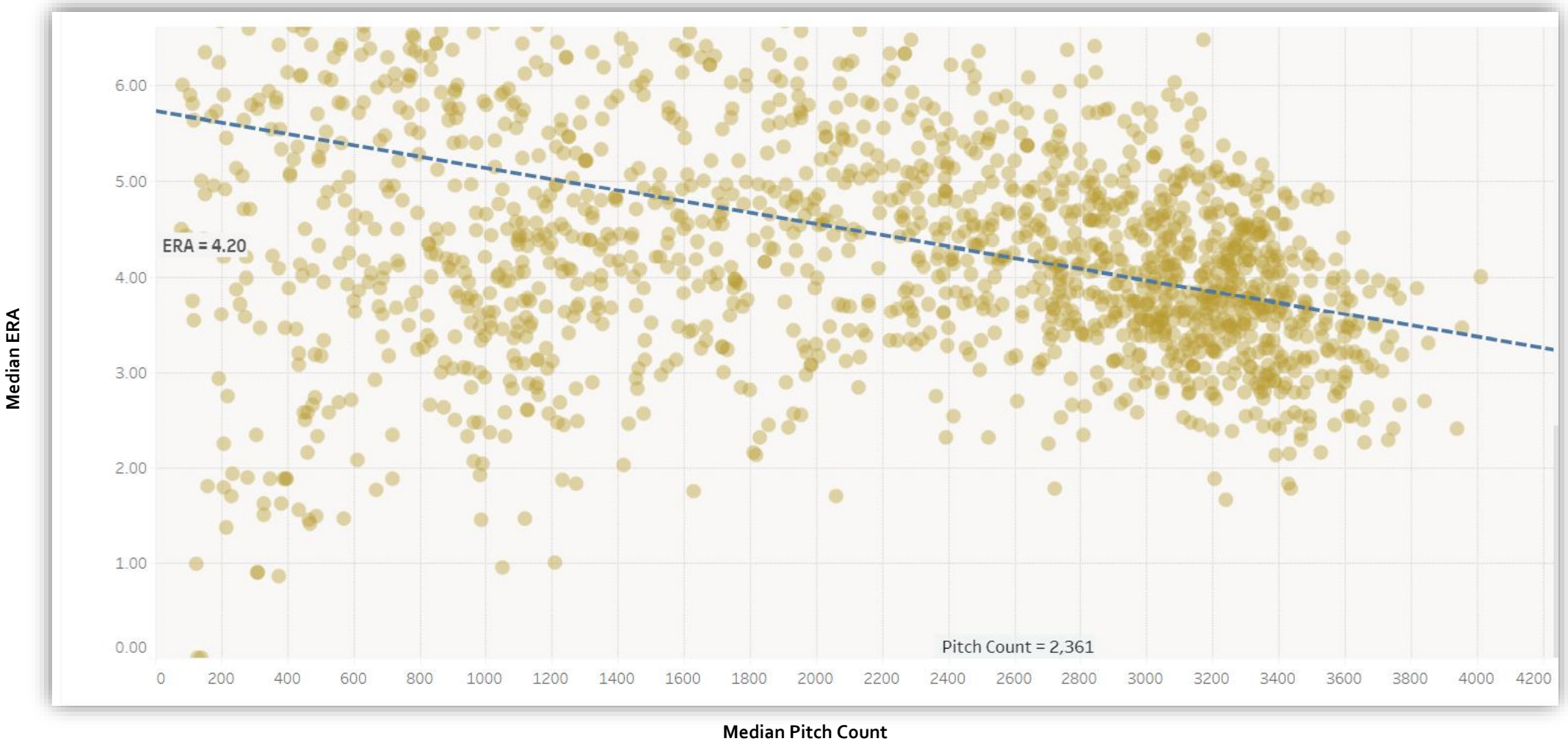
Pitcher Correlation Heatmap 2005 -2019



Source: Baseballsavantmlb.com

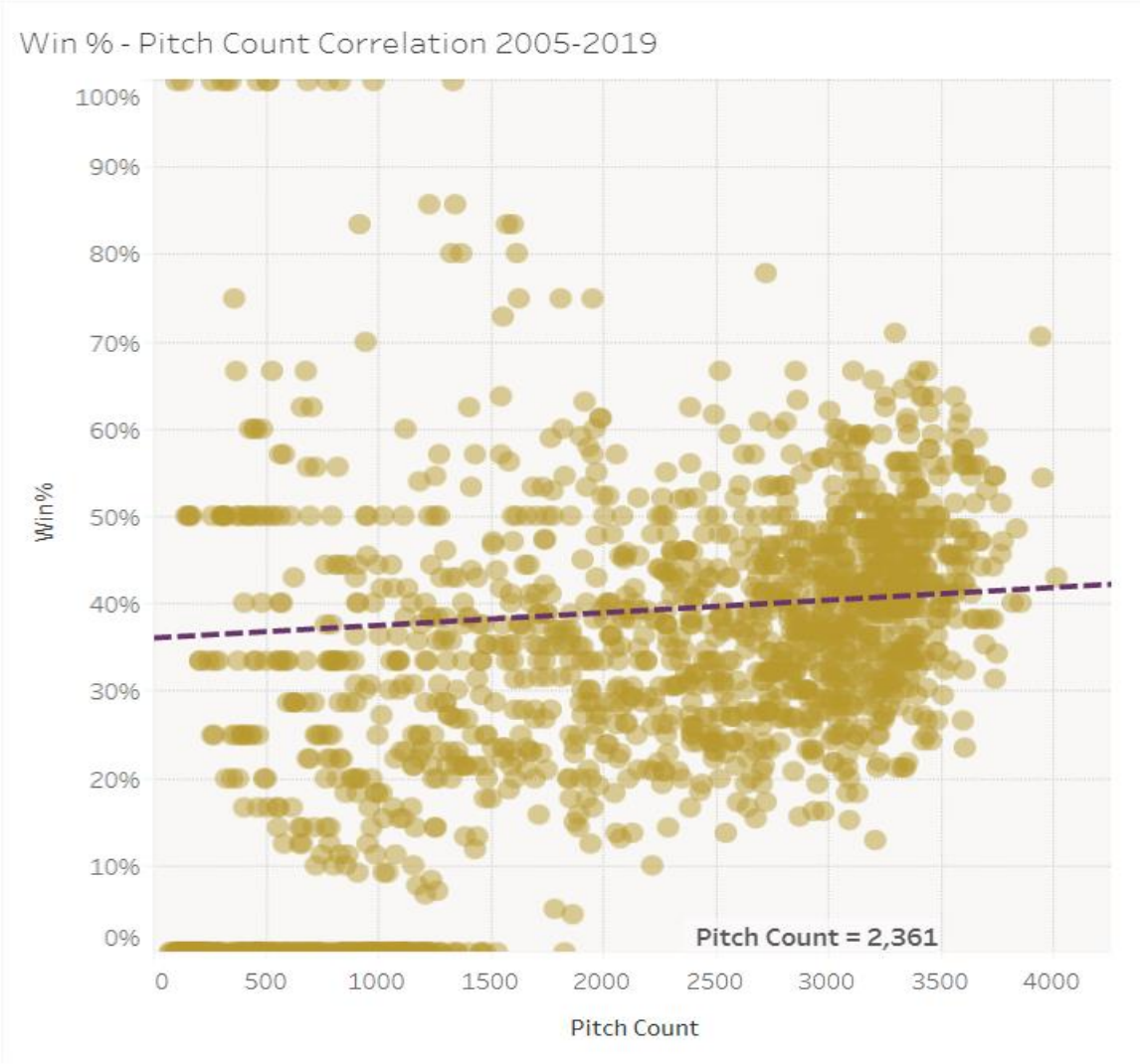
The linear regression model for ERA (Earned Run Average) indicates a negative correlation between ERA and pitch count. The lower the ERA, the better it is. Therefore, the trend line shows a slight improvement in the ERA as the pitch count increases.

ERA Pitch Count Correlation 2005 -2019



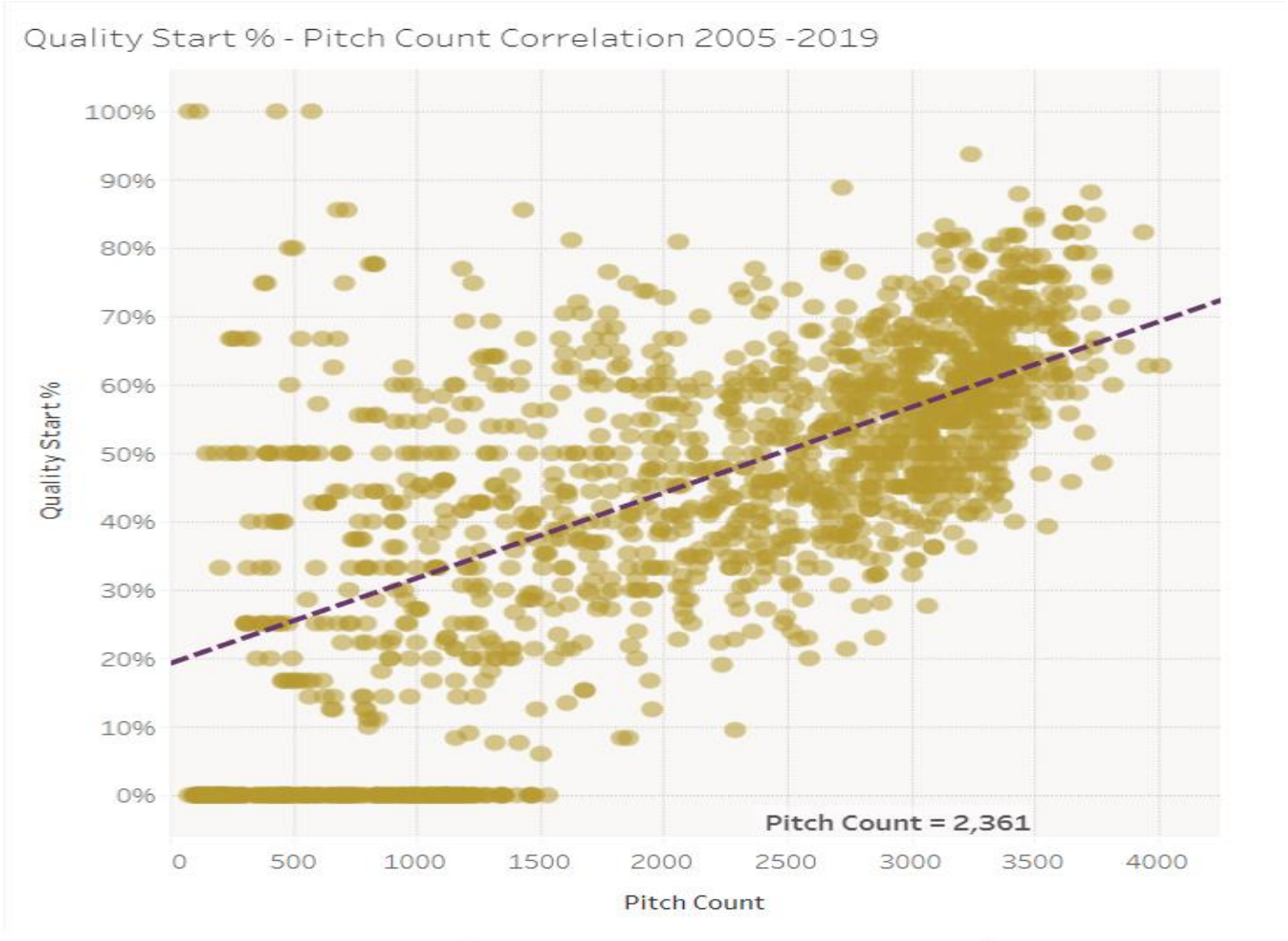
Source: baseballsavant.mlb.com, mlb.com, www.spotrac.com/mlb

The linear regression model for Win % [number of wins / number of games started] shows a weak correlation between Win% and pitch count. There is virtually no relationship between Win% and pitch count.



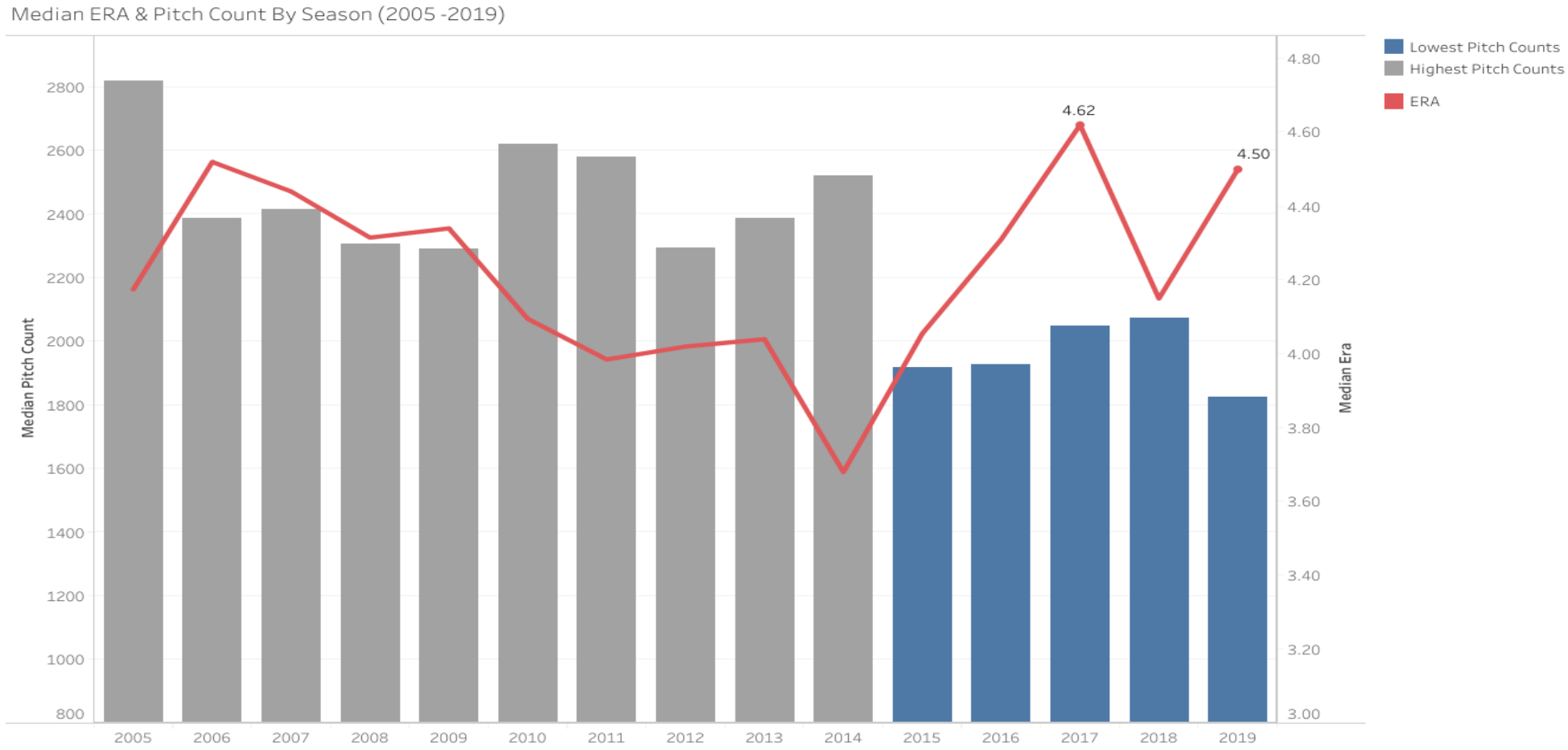
Source: baseballsavant.mlb.com, mlb.com, www.spotrac.com/mlb

The final linear regression model shows a strong positive correlation between Quality Start % [Quality Starts / Games Started] and the pitch count. A quality start is defined as a start in which the pitcher goes at six innings and allows three earned runs or less. This model shows that, once again, more successful pitchers are able to endure higher pitch count with no degradation in performance.



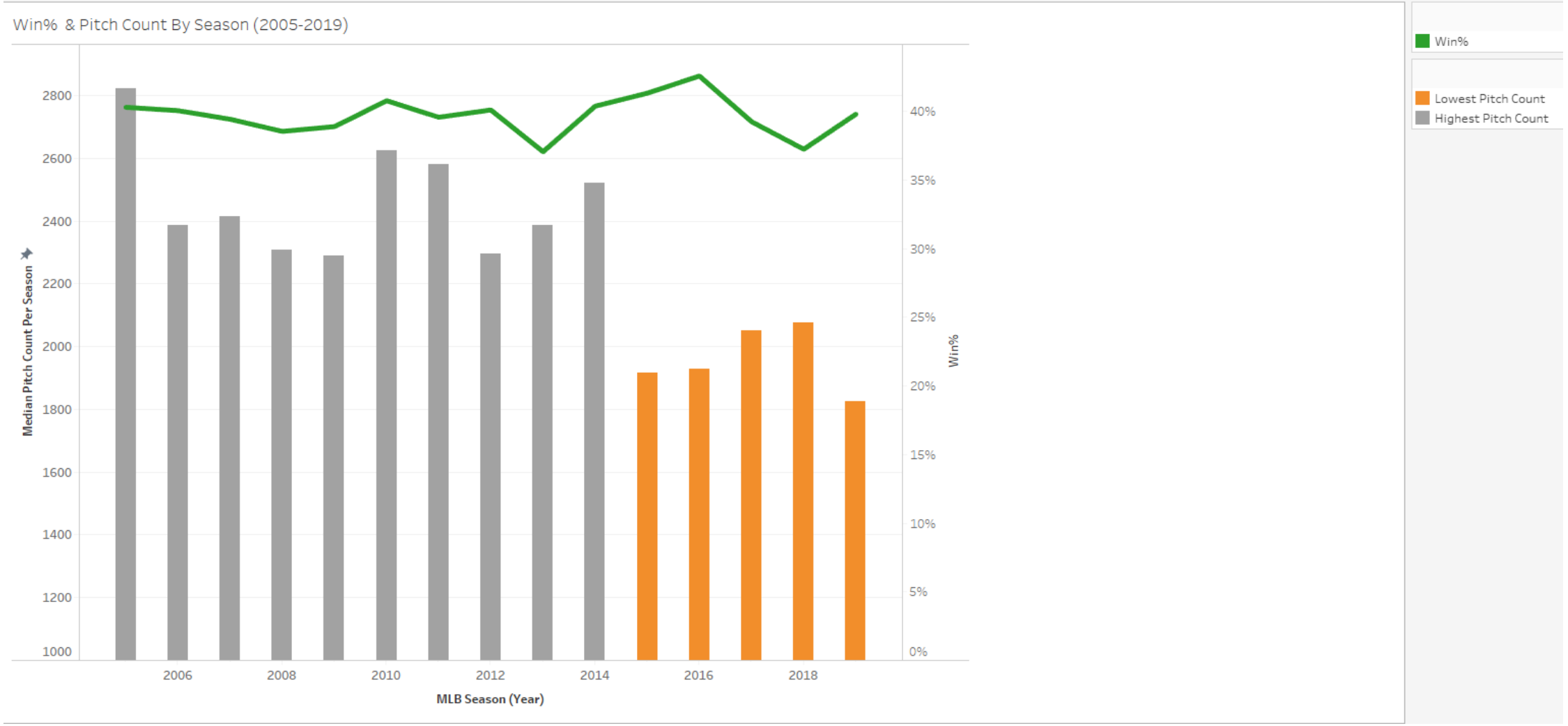
Source: baseballsavant.mlb.com, mlb.com, www.spotrac.com/mlb

This column chart compares the median ERA to the median pitch count by the season. Note that although some of the lowest pitch counts occurred in the last five seasons, the ERA actually spiked. Despite lower pitch counts, no improvements.



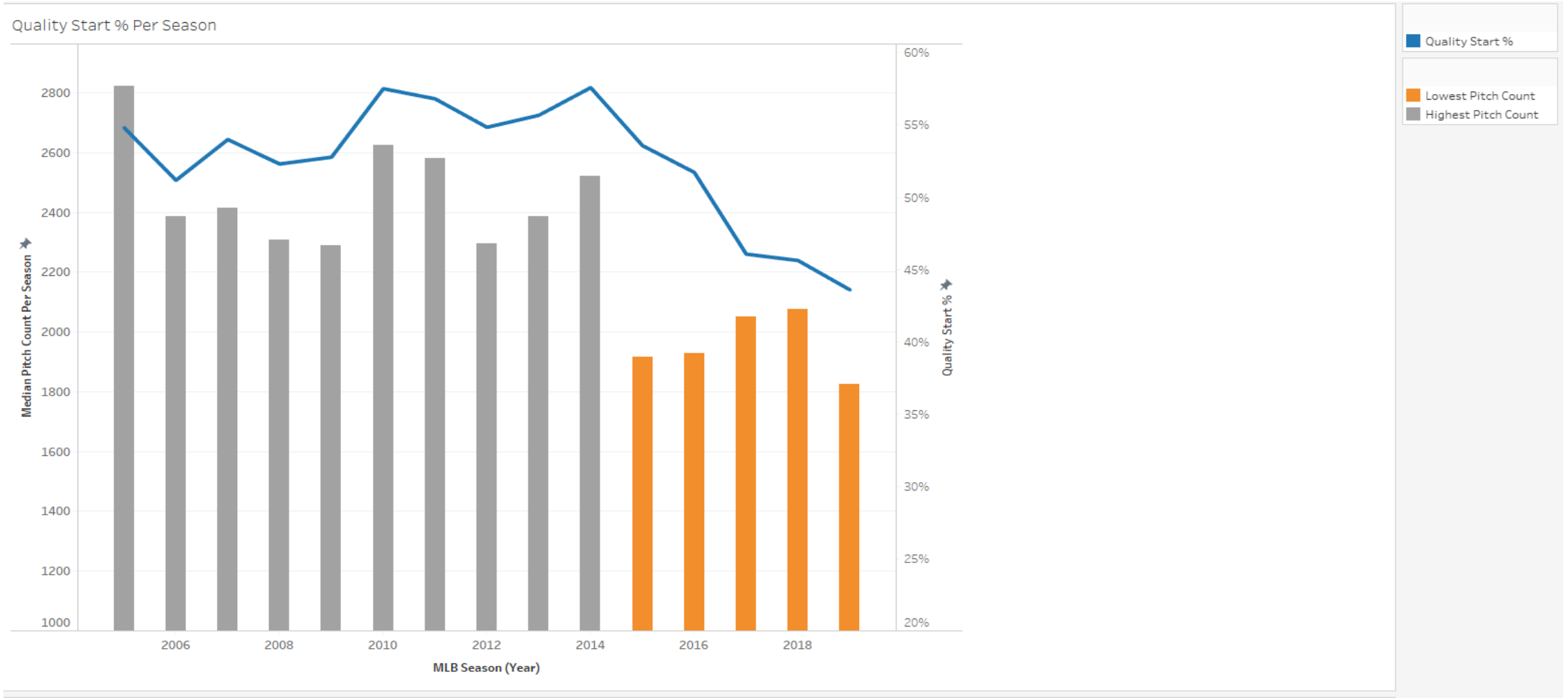
Source: baseballsavant.mlb.com, mlb.com, www.spotrac.com/mlb

This column chart compares the change in Win% to the median pitch count by the season. Although the last five seasons had the lowest pitch counts, only one year experienced a brief rise in Win%. Otherwise, there is no significant improvement.



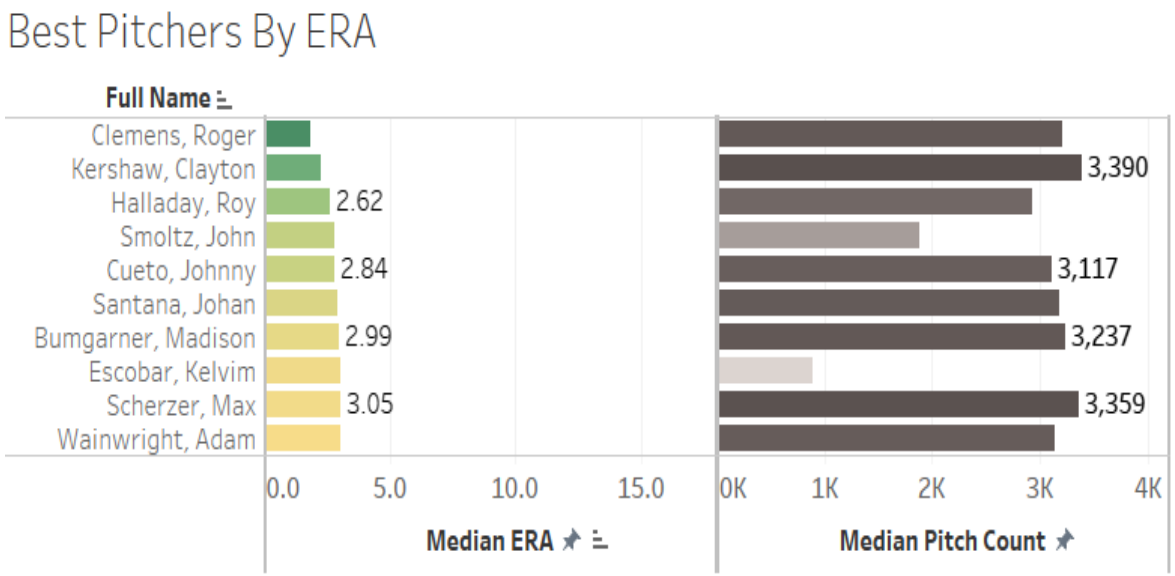
Source: baseballsavant.mlb.com, mlb.com, www.spotrac.com/mlb

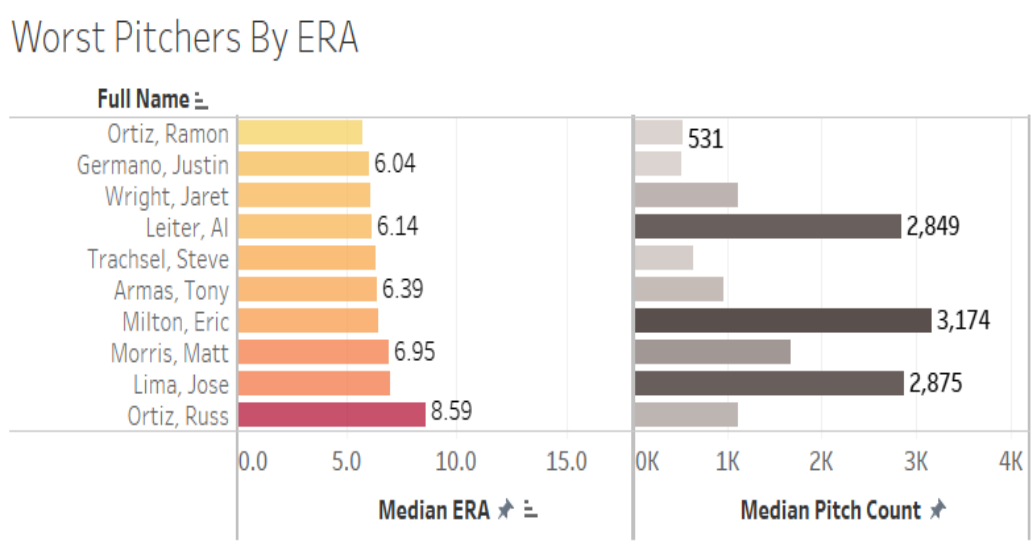
This column chart compares the change in Quality Start% to the median pitch count by the season. The Quality Start % declines from 55% to 45% in the last five seasons despite the much lower pitch count. This data contradicts the theory that lower pitch counts results in better performance.



Source: baseballsavant.mlb.com, mlb.com, www.spotrac.com/mlb

These charts compare the best pitchers by ERA with the worst pitchers by ERA. Eight out the top ten pitchers exceeded the median pitch count for that period (2361). In contrast, seven out of the ten worst pitchers fell below the median. A lower pitch count did not result in a better performance.

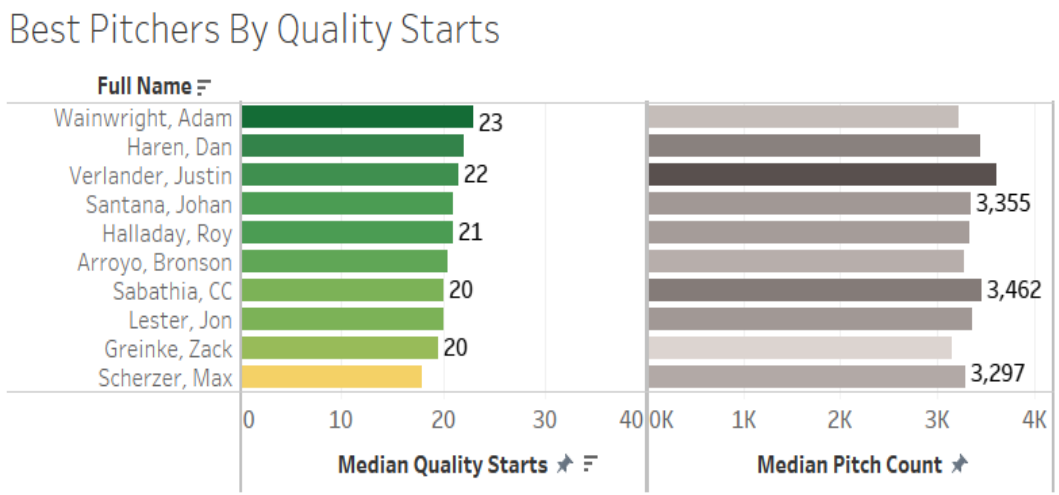


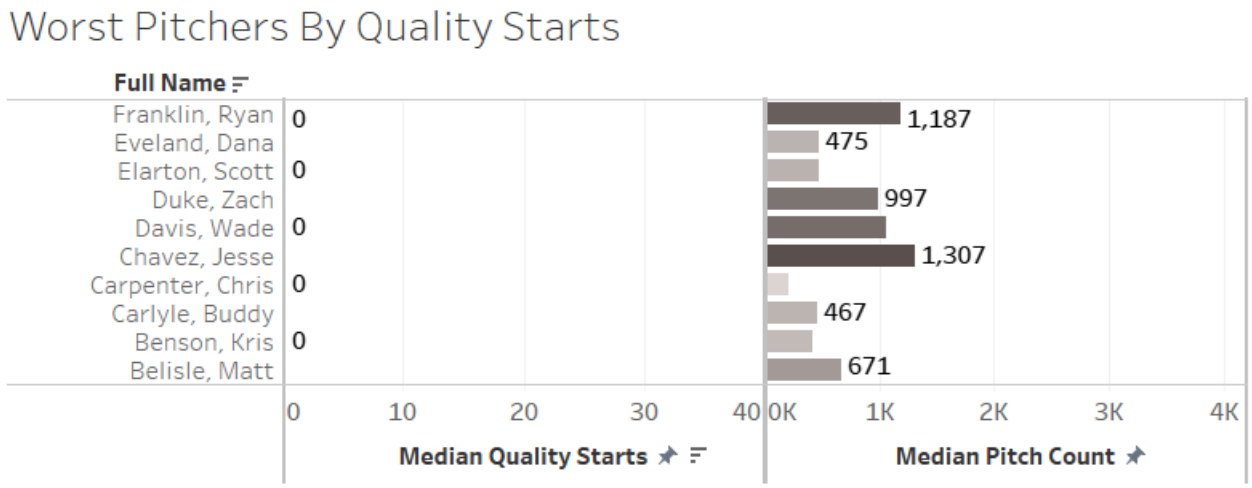


(Seasons 2005 – 2019)

Source: baseballsavant.mlb.com, mlb.com, www.spotrac.com/mlb

Comparison of pitchers by quality starts reveals that the best pitchers exceed the median pitch counts while the lesser performing pitchers throw far fewer pitches. Higher pitch counts did not negatively affect elite pitchers' performance.

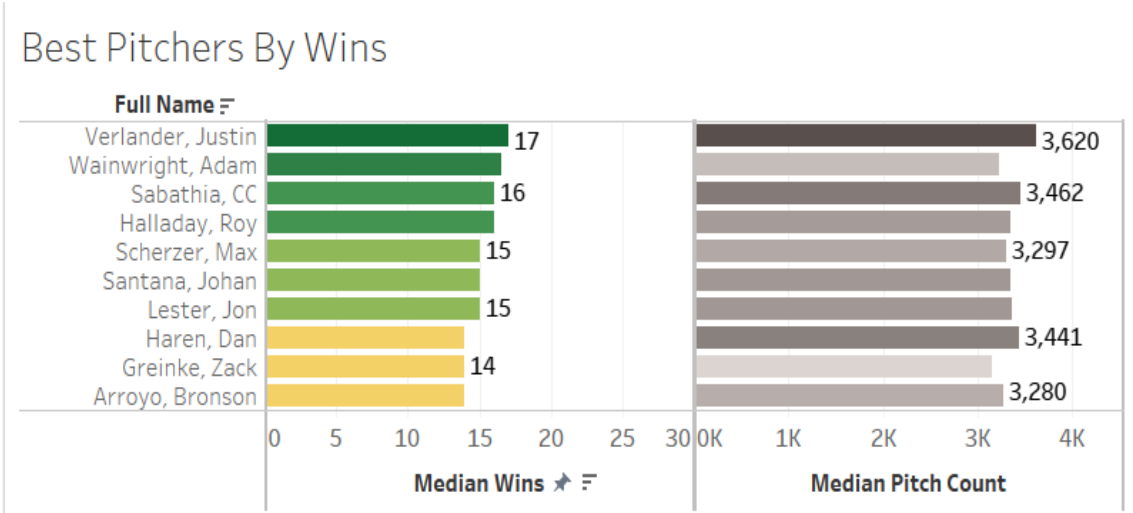


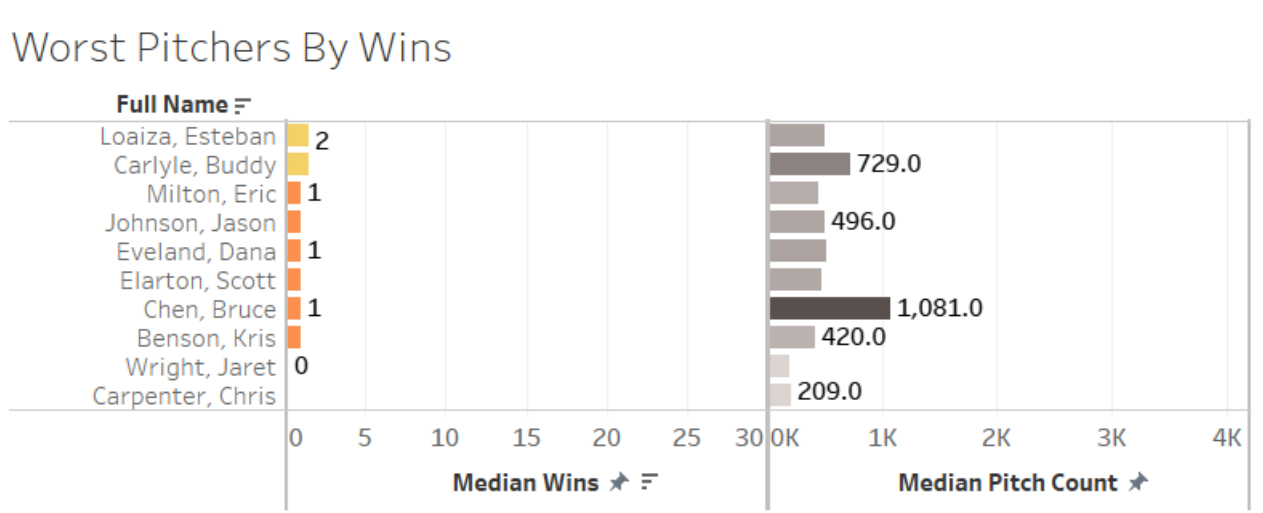


(Seasons 2005 – 2019)

Source: baseballsavant.mlb.com, mlb.com, www.spotrac.com/mlb

The final chart confirms findings from the previous analyses. The elite pitchers average well over 3000 pitches (far exceeding median pitch count –2381) yet delivered the best performances over the 15-year period.





(Seasons 2005 – 2019)

Source: baseballsavant.mlb.com, mlb.com, www.spotrac.com/mlb

Conclusion

- Solely reducing pitch counts do not improve pitcher's performance in three key metrics: ERA, Quality Starts, and Wins.
- Successful pitchers actually had much higher pitch counts in all three categories.
- Higher pitch counts are not the root cause for a decline in pitcher performance
- Pitch count control could result in underutilization of star pitchers, resulting in subpar seasons, reduced attendance, and less revenue.
- This analysis does not prove that higher pitch counts improve pitcher statistics. It simply proves that teams should consider other factors (overall conditioning, mechanics, pitch selection) when attempting to preserve pitcher performance.