

# BOWLED OVER:

## A Statistical Analysis of Bowling in Cricket Analysing both the Male and Female Aspects of the Game Using Live Data

### Abstract

I carried out a statistical analysis of bowling style and performance metrics in cricket. I concentrated on the limited overs Twenty-Twenty (T20) cricket leagues only. The format is consistent across the 5 leagues in relation to duration and length of the matches.

T20 is the most popular form of cricket because of its quick pace and high stakes leagues. The use of different bowlers and the need to take wickets quicker is particularly important in the limited overs match format.

I investigated six different questions across both male and female leagues (listed below). These questions looked at different statistics within bowling in cricket. These questions are important to understand the impact of bowling style on performance metrics and the findings can be used to inform managerial decision making when choosing what bowler to play in certain circumstances.

I also wanted to analyse these questions because they are of significant importance to me in my sporting career, I currently play club cricket for Malahide, regional for Fingal and provincial for Leinster. I hope to play for Ireland in the future.

### Experimental Methods

I choose T20 cricket leagues because they are limited to 20 overs per innings which allows the leagues to be compared without different match format and tactics impacting data.

The male cricket leagues I used were the Indian Premier League (IPL), the Big Bash League (BBL) and the Men's World Cup 2023 (WC2023). The female cricket leagues I used were the Women's Big Bash League (WBBL) and the Women's World Cup 2023 (WWC).

#### My research questions:

1. Does height affect the bowling style of a bowler?
2. Does bowling style affect the number of wickets taken by a bowler?
3. Does bowling style affect the number of maidens bowled by a bowler?
4. Does bowling style affect the strike rate of a bowler?
5. Does bowling style affect the bowling run rate economy (BRRE) of a bowler?
6. Is there a correlation between the number of wickets taken by a bowler and the number of runs conceded to the batting team by the bowler? Does this correlation vary with bowling style?

Bowling performance metrics were downloaded into excel. Height and bowling style were added manually. This task was a lot more challenging for the female aspect of the game.

The following statistical calculations were completed in excel: Averages, standard deviation (STDEV), XY scatterplots, linear regression and Pearson's correlation coefficient ( $R^2$ ). All data is available in the project booklet.

### Comparative Data Analysis

Most of the findings were the same between the male and the female leagues such as Bowling run rate economy and the correlation between the amount of wickets taken and the amount of runs conceded to the batting team.

There were a number of statistical findings different to that of the male leagues such as Pace bowlers in the male leagues took more wickets than that of spin bowlers, but in the female leagues it was the complete opposite in both the WBBL and the WWC, with spin bowlers taking more wickets than Pace bowlers.

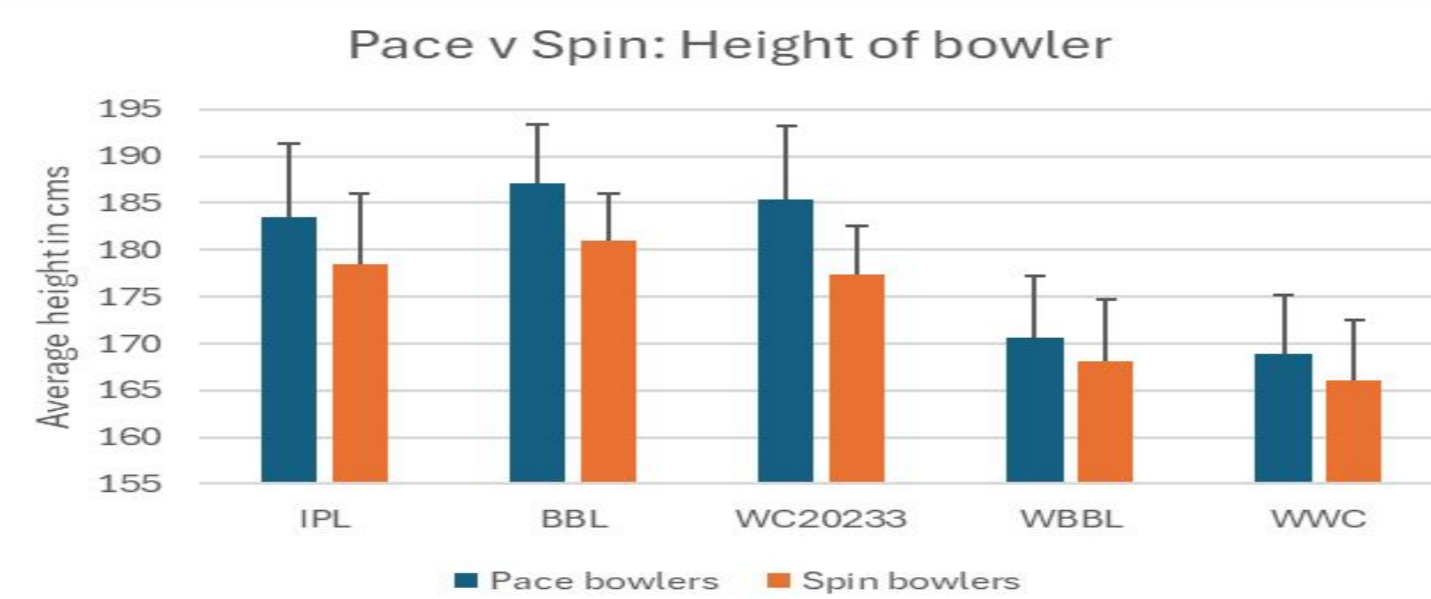
In the three male leagues pace bowlers had lower strike rates than their spin bowling counterparts. The lower the strike rate the better. In both female leagues pace bowlers had higher strike rates, but in their defence, the difference was marginal.

### Results and Data Analysis

#### 1. Does height affect the bowling style of a bowler?

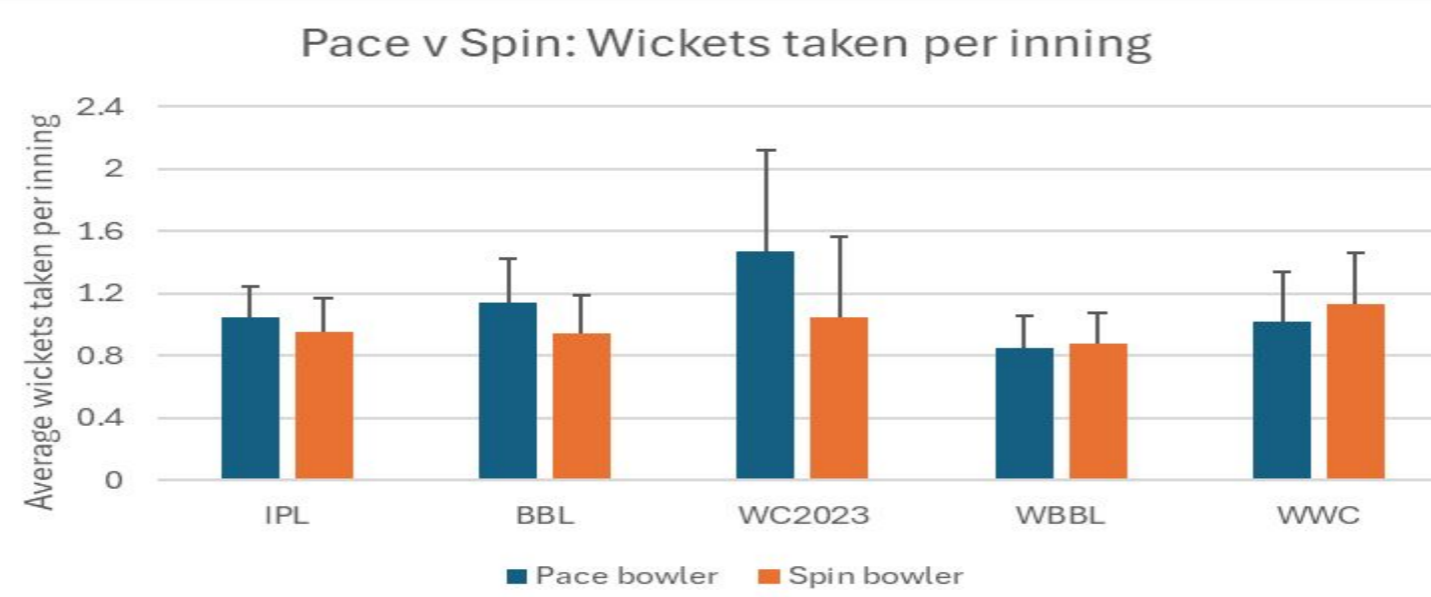
Pace bowlers are taller on average than spin bowlers across all 5 leagues. In the female leagues the difference was much smaller when compared to the male leagues. This is not surprising as pace bowlers rely on the speed and swing of the ball which is generated by the height of the release point of the ball and speed upon release. The taller the bowler is, the higher the release point. A longer stride increases running speed and the ball is released at a faster pace.

BBL bowlers were taller on average than IPL bowlers. The BBL is the Australian national league and the IPL is the Indian cricket league. The average height of an Australian man is 175cm and the average height of an Indian man is 165cm.



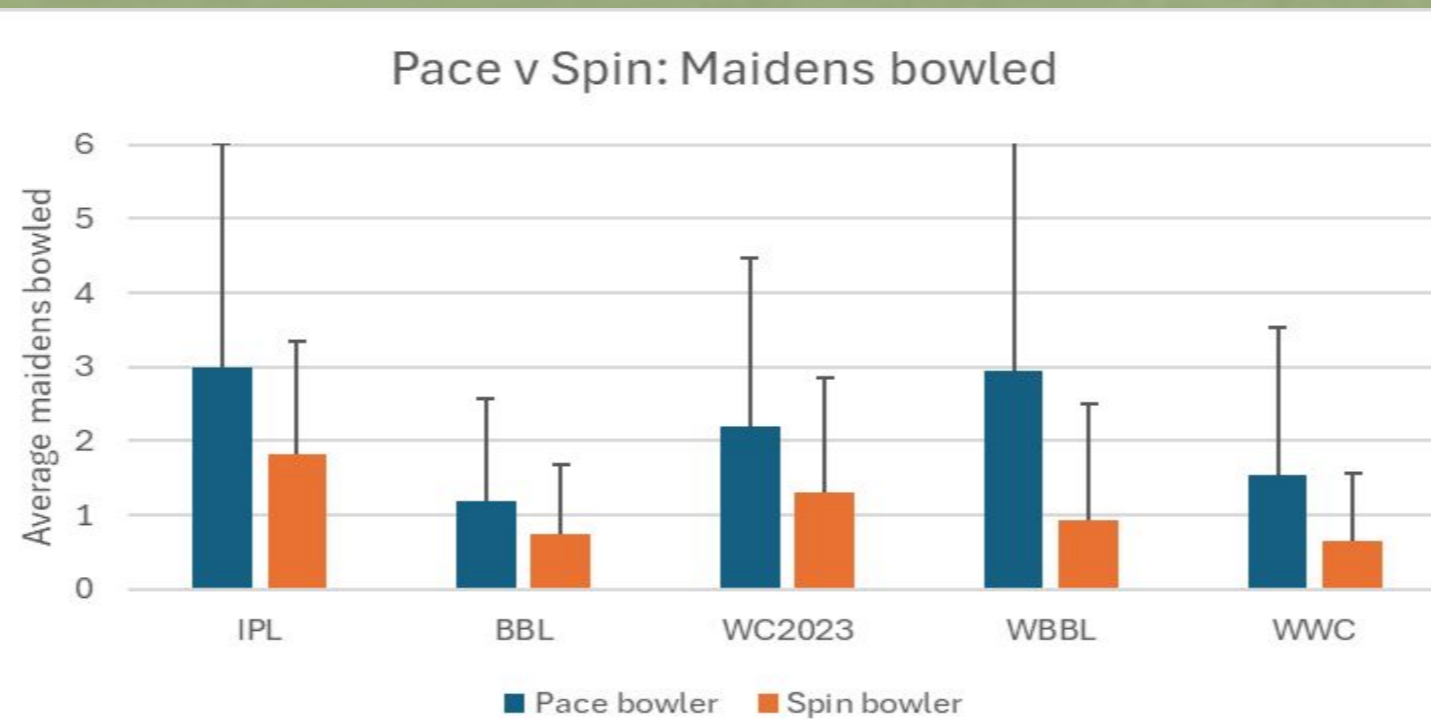
#### 2. Does bowling style affect the number of wickets taken by a bowler?

Male pace bowlers took more wickets than spin bowlers across all 3 leagues. Female spin bowlers took more wickets than pace bowlers, albeit the difference was marginal.



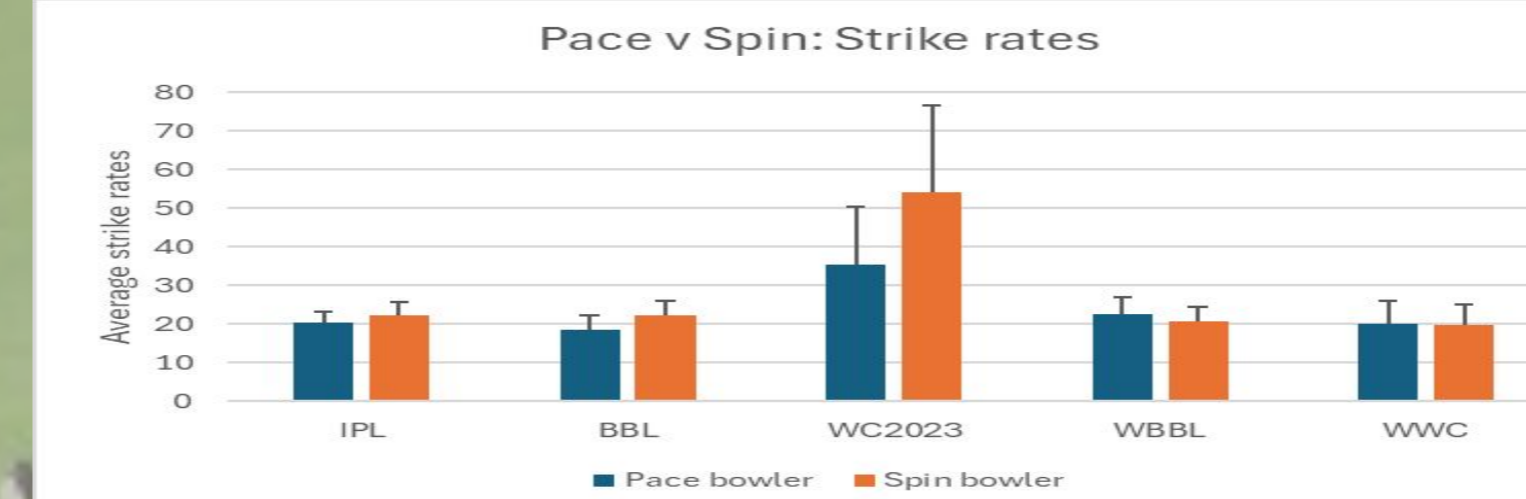
#### 3. Does bowling style affect the number of maidens bowled by a bowler?

On average, pace bowlers bowled more maidens than spin bowlers across all 5 leagues. The difference was most notable in the IPL and WBBL. The IPL and WBBL are considered the highest standard cricket leagues for each gender in the world and attract the best players.



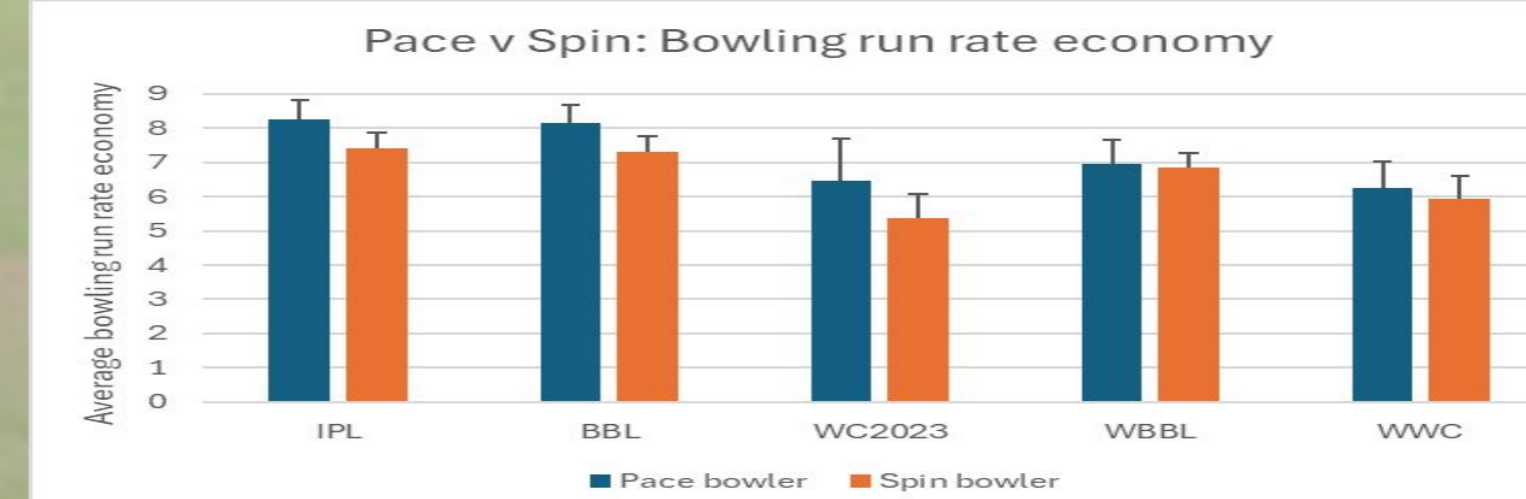
#### 4. Does bowling style affect the strike rate of a bowler?

Pace bowlers had lower average strike rates than spin bowlers across all 3 male leagues. The IPL and BBL average strike rates are considerably lower than the WC2023 average strike rates. A possible cause for the higher strike rates in the WC2023 is the varying skill levels between teams in the 2023 World Cup, whereas in both the IPL and the BBL the teams would be of similar skill standard levels. In the female leagues spin bowlers had a lower strike rate than pace bowlers. Reduced height is likely a contributing factor to less speed generated by female pace bowlers.



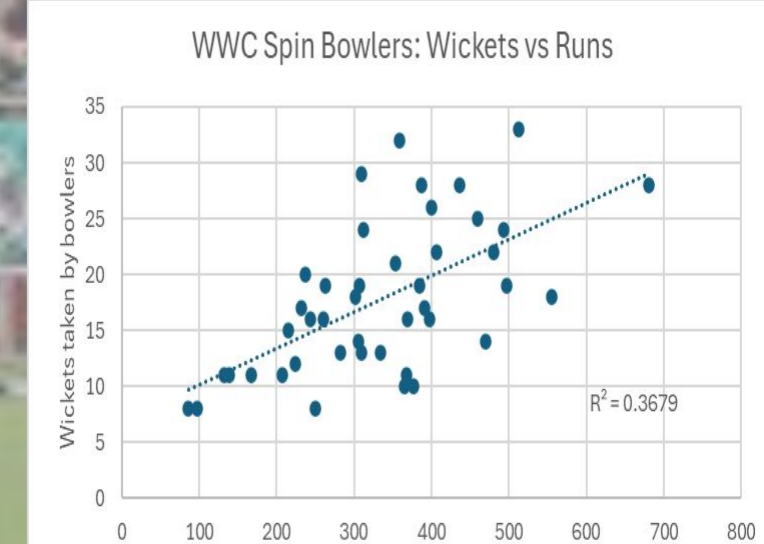
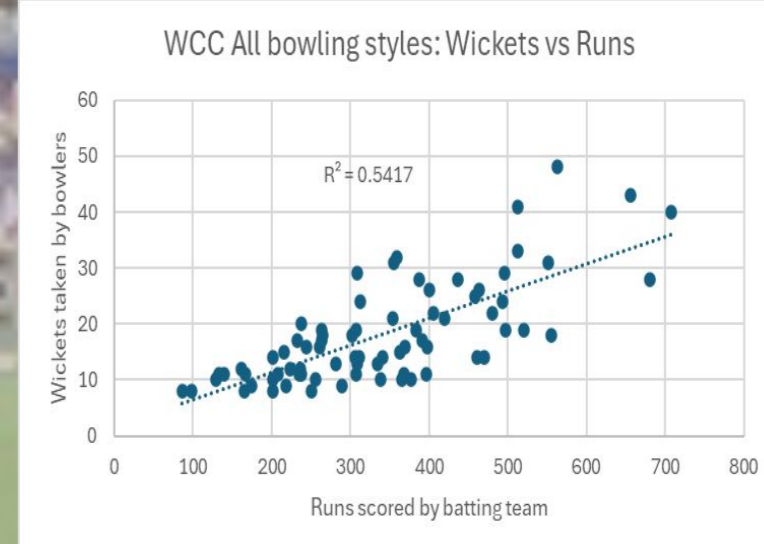
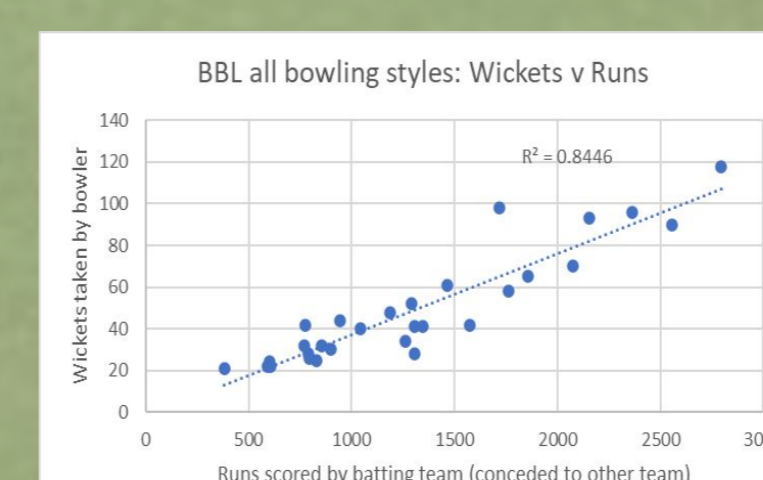
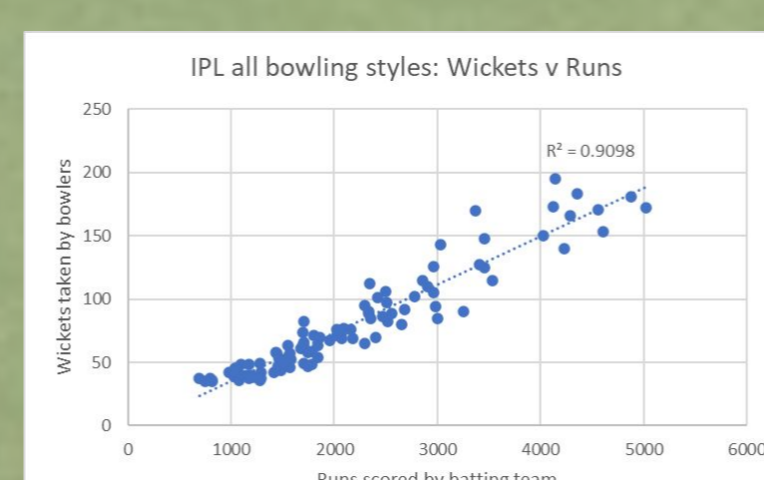
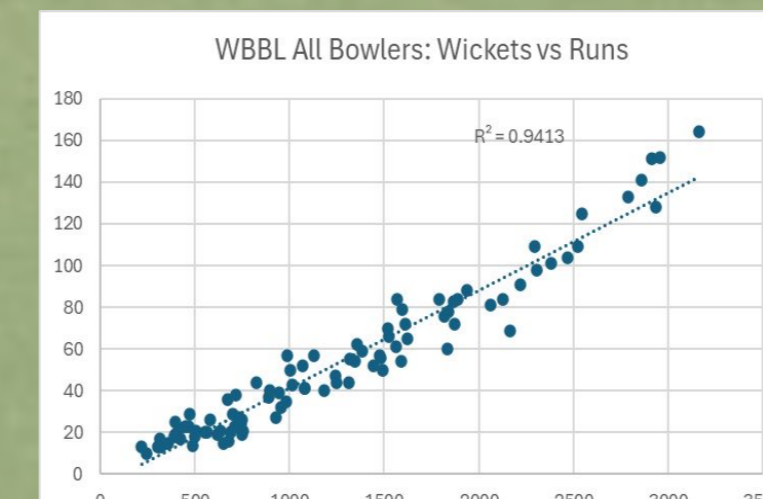
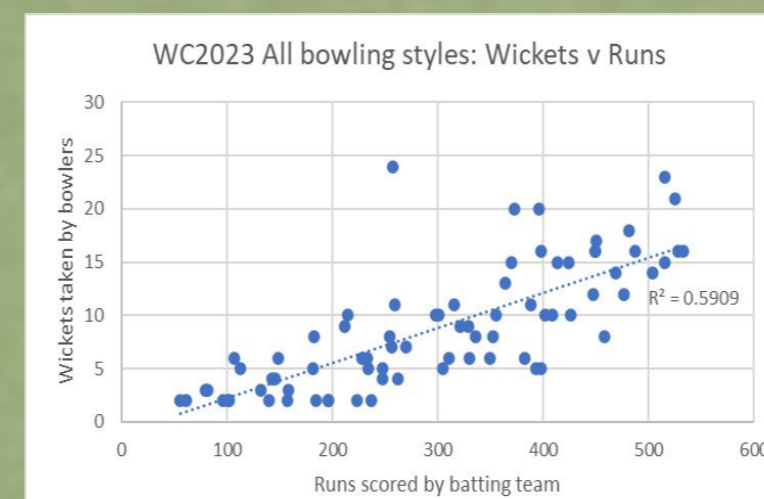
#### 5. Does bowling style affect the bowling run rate economy of a bowler?

Spin bowlers had a slightly lower bowling run rate economy across all 5 leagues. There was a greater difference in the male leagues.



#### 6. Is there a correlation between the number of wickets taken by a bowler and the number of runs conceded to the batting team by the bowler? Does this correlation vary with bowling style?

Using XY scatterplots, linear regression and Pearson's correlation coefficient ( $R^2$ ) there was a strong correlation (0.7-0.9) between the number of wickets taken by the bowler versus the runs scored by the batting team against that bowler in both the IPL ( $R^2=0.9098$ ), BBL ( $R^2=0.8446$ ) and WBBL ( $R^2=0.9413$ ) when all bowling styles were included in the analysis. However, in the World Cups (WC2023) there was only moderate correlation (0.4 - 0.6) with  $R^2=0.5909$  in the WC2023 and  $R^2=0.5417$  in the WWC.



### Implications for cricket

These statistical findings can be used to influence managerial decision making to ensure strategic use of bowlers. The choice of bowler can be tailored to the situation in a match.

In T20 cricket it is important for opening bowlers to take more wickets quickly (so that the opening, likely better, batters are dismissed quickly), even if this means sacrificing more runs. The risk is that aiming to hit the stumps is in the swing arc of the batter which therefore means the higher chance of boundaries (4 or 6 runs). However the reward is dismissing top class batters quickly before they have a chance to make a large impact on the score.

Male pace bowlers should be used at the start of a T20 game to dismiss top order batters quickly. However, the spin bowlers might be beneficial to open in female T20.

In general, spin bowlers are better to use in a situation where you want to concede less runs and are willing to sacrifice taking wickets quickly. This would be most useful when the batting side (opposing team) is chasing down a low total when batting second.

Height is a key element of bowling to allow you can generate more bounce and spin upon delivery of the ball.

### Conclusions

I believe that all of these statistics are of vital importance in the cricketing industry, not just with managerial decision making but also for a person that is new to the game and who is looking for information on what type of bowler to become and what they want to achieve in cricket. I believe that all of these statistics can be used across levels ranging from club to international level.

The statistical analysis of bowling metrics in cricket offers valuable insights into performance trends and influencing factors. Gender-specific studies underscore the need for tailored training approaches, while advanced statistical tools enable deeper understanding and prediction of success factors.

### References

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