The Big Ben Effect: An Analysis of how Injuries Impact Players in Fantasy Football



Introduction

Fantasy football provides a way for many fans of the NFL to continue their shared interest while still having fun with their friends or even strangers. However, as the season progresses, many rosters run into the issue of losing their best players due to injury. After the player comes back from injury, it's extremely difficult to decide whether to put him in or not, because you don't know how they will perform their first week back. This presentation will help alleviate some of that doubt by performing injury analysis to determine which injuries are most detrimental to fantasy points. The presentation will also show which players are affected most by injury by analyzing their fantasy performances the week after they come back from injury.

Background

Almost every person who plays fantasy football has had injury issues during the year; especially this year. My 1st pick (Michael Thomas) has played half of a game so far. Along with Thomas, Henry Ruggs and Josh Jacobs have been injury plagued this year too. Anyways, for the last few weeks, Michael Thomas has always been questionable, and at the time, I didn't know if I should put him in or not. While it's risky putting someone in who would be playing injured, it might just be worth it if it is someone of Michael Thomas's caliber. This thought caused me to have this idea for this presentation.

Materials and Methods

I scraped five years of injury data from nfl.com, then scraped five years of fantasy football points data from fantasydata.com. The data was made publicly available through those sites. Once downloaded, I imported them both into R and found a way to combine both of them into a single database. The biggest issue I ran into was a way to determine if a player was riding the bench the whole game. The reason this is an issue is because players who are active on game day, but don't see any snaps, are still given a fantasy score of zero points. The reason this is an issue is that it drags down the averages for everyone else. For example, Johnny Holton for the Steelers had o fantasy points most of last season. While he did get some offensive snaps, he wasn't really a part of our offense. The way I fixed the issue of bench-riders was:

How I Decided Which Players to Count

For each of the scoring position groups (only QBs, WRs, RBs, and TEs), I found players who had multiple zeroes, and removed them from the data.

QBs: If they had more than 1 zero, they were removed (Believe it or not, a QB who wasn't injured actually got a zero for their fantasy score). WRs, RBs, and TEs: If they had more than two zeroes, they were removed. It's possible for players to get neutralized or not utilized enough, so they get a little more leniency.

Once I figured out how to separate the data of injured players from non-injured players, the rest was easy. In order to determine whether injured players, I used a paired t-test to compare these two means.

Separately, I was able to use the data and group by injury type, which allowed me to determine the average fantasy points based on the injury type.

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Results

Here are the averages for fantasy points after injury versus when healthy:



As you can see, there is a large difference between post-injury and when healthy for wide receivers, tight ends, and running backs. However, when it comes to quarterbacks, they do better after their injuries than the average healthy quarterback. There are a few explanations I can think of:

1. The small sample size could skew up the results 2. If a starting QB goes down, then the backup comes in and only gets 10 points, that will lower the average healthy QB score

After running the t test, here are the results we get:

Position	p-value
QBs	0.8021
WRs	1.391E-12
RBs	2.16E-05
TEs	3.097E-08

All 3 of WRs, RBs, and TEs have a p-value that is lower than 0.05, which means that these results are statistically significant. What that means is that there is a noticeable difference between the average healthy receiver and the average post-injury receiver. I believe that receivers, running backs, and tight ends suffer more is due to the speed and/or strength that is needed for all 3 of those positions.

As for QBs, with a p-value=0.8021, that means there is almost no significance between healthy QBs and post-injury QBs. Quarterbacks have a lower sample size than the other positions, which could be another reason that their p-value is much higher than the rest.



As you can see from the data, players with right shoulder injuries tend to play better when coming back from injury, while players and pectoral and elbow injuries tend to play poorly.

Some issues with this is that there isn't enough data to determine if this data is accurate. As every single statistician will ever tell you, more data is needed to make sure this is accurate.

In conclusion, wide receivers, running backs, and tight ends aren't a smart option to start on your fantasy team the first game they come back from an injury. They often score significantly less fantasy points than a healthy wide receiver/running back/tight end. Quarterbacks, on the other hand, can come back from injury and not skip a beat. They tend to score a normal number of fantasy points, and sometimes even more. As for specific injuries, there isn't enough data to make definitive conclusions, but from the data I have, it seems as if players with a right shoulder injury tend to recover better, whereas players with elbow and pectoral injuries tend to recover poorly from injury in their first game back.

1. Using Pro Football Focus (PFF) grades, you could also apply this to defensive players and offensive linemen. 2. Adding more data. Having 10+ years of data would make this study have more definitive conclusions. 3. Having more complete data. Sometimes players who are injured didn't have anything listed under injury, so there were incomplete data points.

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Injury Types

Here are the average fantasy points based on the first game back from each injury:

Conclusion

Future Extensions