



# Modeling Batted Passes in Football

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# Intro

- Exploring the factors that go into causing batted passes
  - Batted pass: defender hits the ball down shortly after QB releases it
  - Typically results in incomplete pass, no yards gained
- Initial characters
  - QB height,
  - Defender height
  - Defense formation
  - Pass type
  - Overall related more to defense or offense



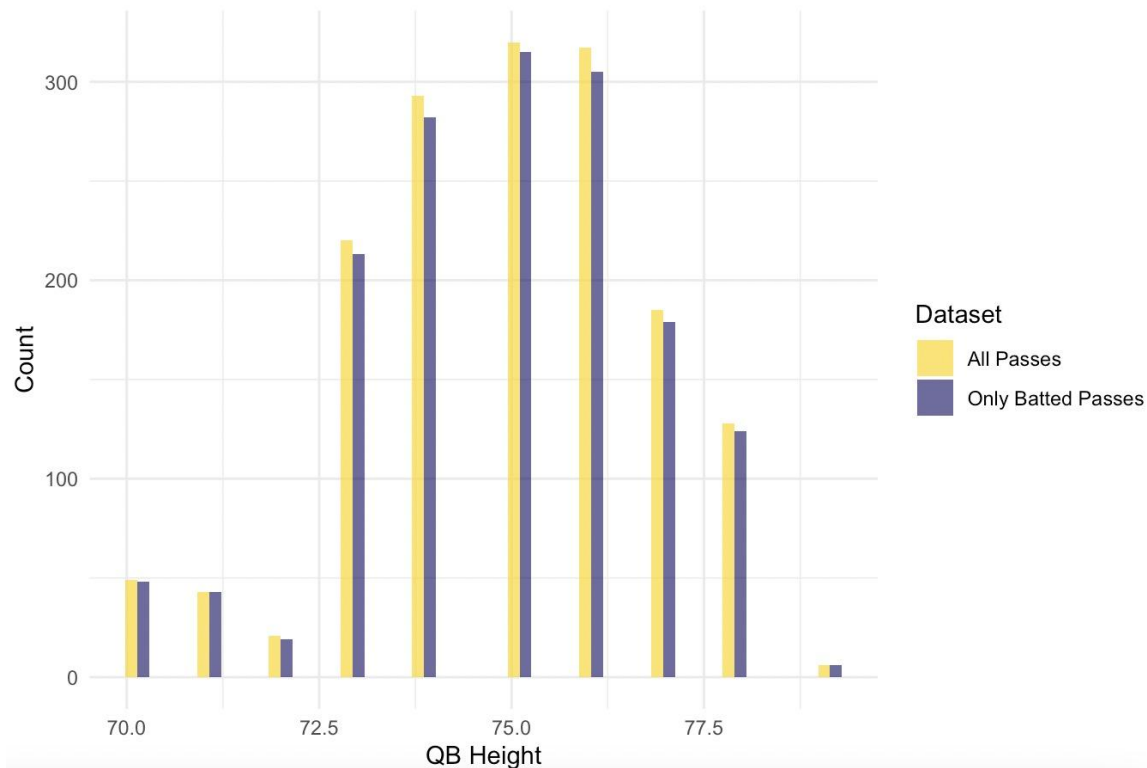
# Data

- Data from nflreadr
  - All plays - 372 columns
  - Did not have information on which passes were batted
- For The Numbers (FTN)
  - Included tipped and batted passes from 2019 - 2023
- Merged the two to find all batted passes
  - Merged on week, year, home/away teams, play ID
  - Gave context to the batted pass plays
- Kaggle NFL Big Data Bowl 2023
  - Some tracking and defensive formation data

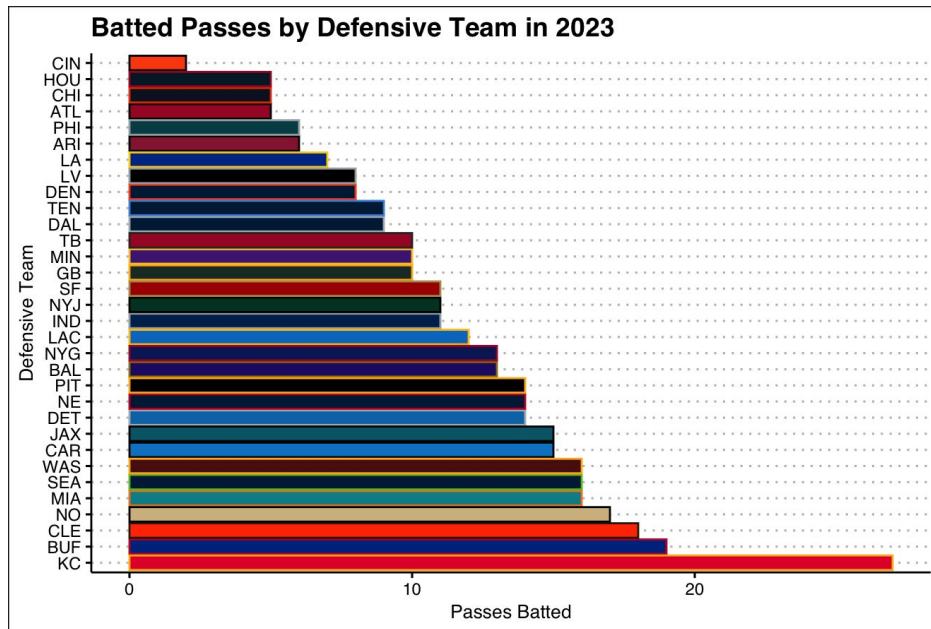
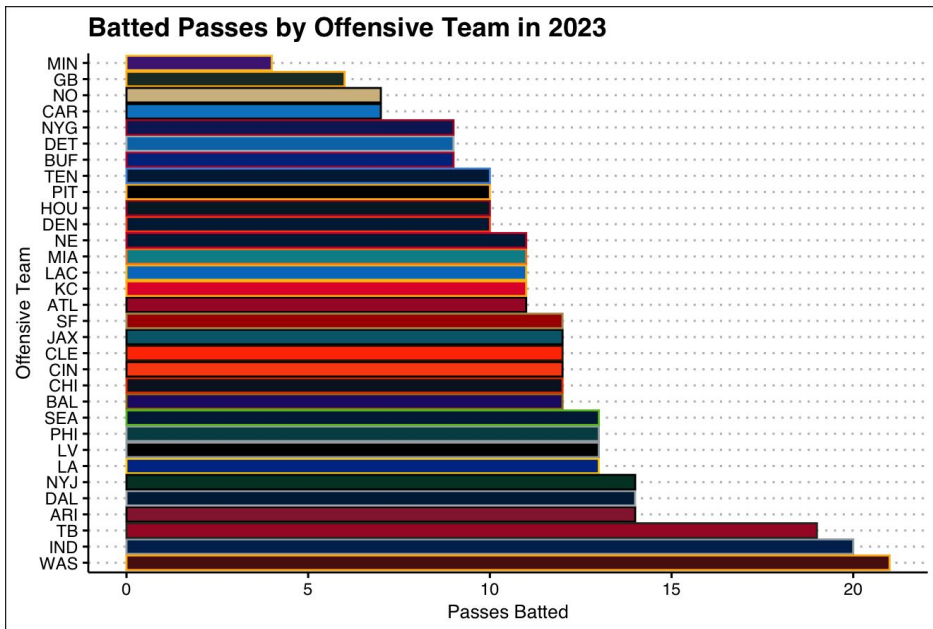
# QB Height Appears to Have No Impact on Batted Passes

## Comparison of QB Heights Influence (2019-2023)

Including vs Excluding Complete Passes



# Batted Passes Vary Based on Offensive and Defensive Team





## Methods

- Create models to determine
  - Which factors influence batted passes most
  - If certain players on the defensive line have bigger impacts
- Try clustering each NFL team based on characteristics of their defensive coverage
- Incorporate tracking data features such as speed off the line for linemen, angle of throw in relation to line of scrimmage
- Estimate probability of a particular pass being batted



## Plan of Action

- Explore QB pass tendencies to see if QBs with very consistent tendencies have more batted passes
- Look at batted passes from the defensive and offensive angle for the 2019-2023 seasons to explore changes
- Bring in tracking data features to dive deeper into defensive line characteristics