

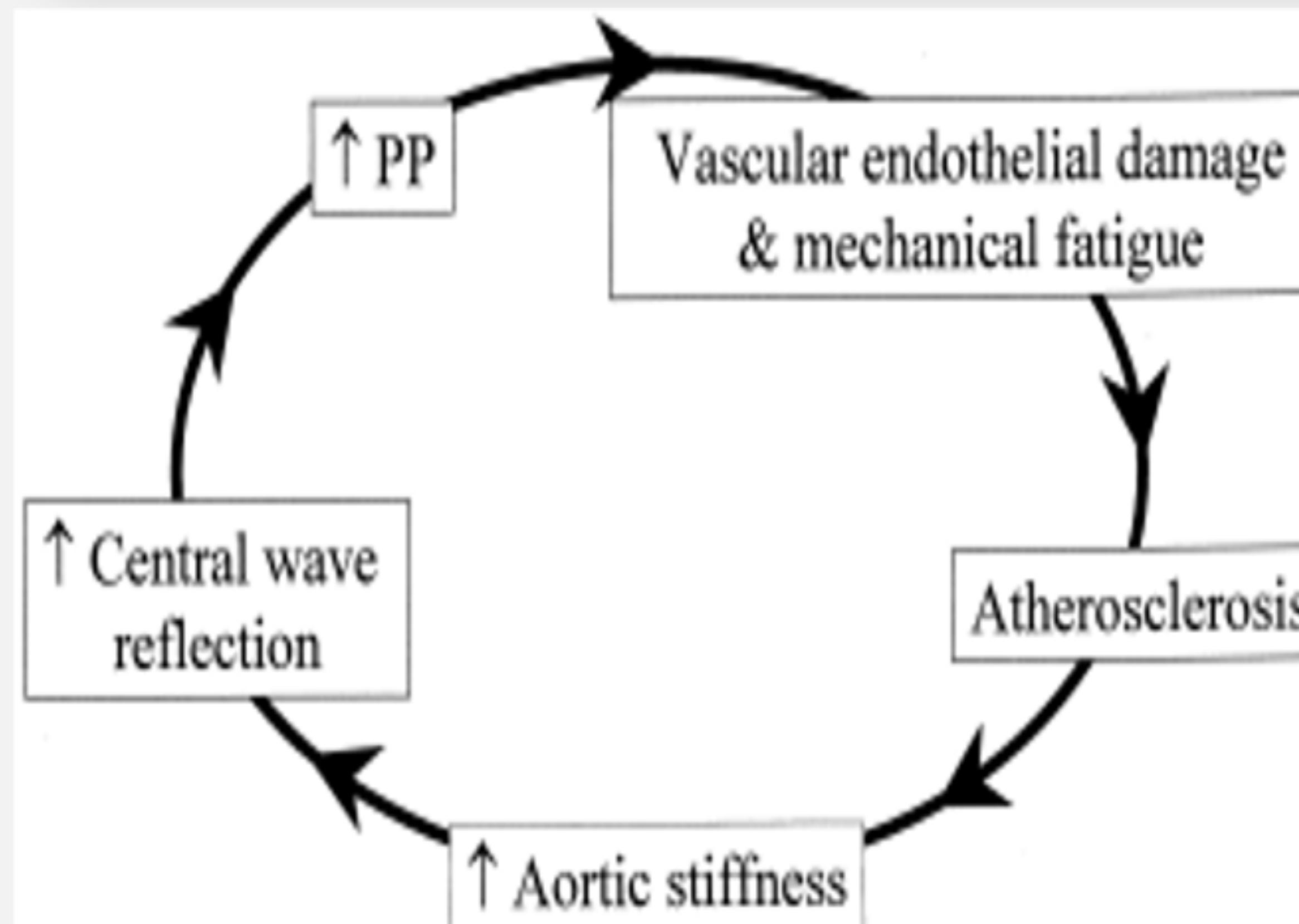
Age-specific Association Between Standing Height and Pulse Pressure in Adults

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Abstract/Intro/Motivation

Nearly half of the adults in the US have hypertension, which is more commonly known as high blood pressure. Hypertension is widely considered to be one of the most important risk factors of heart diseases and its repercussions could be fatal. While standing height is positively associated with blood pressure in the pediatric population, studies have suggested an inverse relationship in adults. Our goal was to analyze the age-specific association between height and pulse pressure.



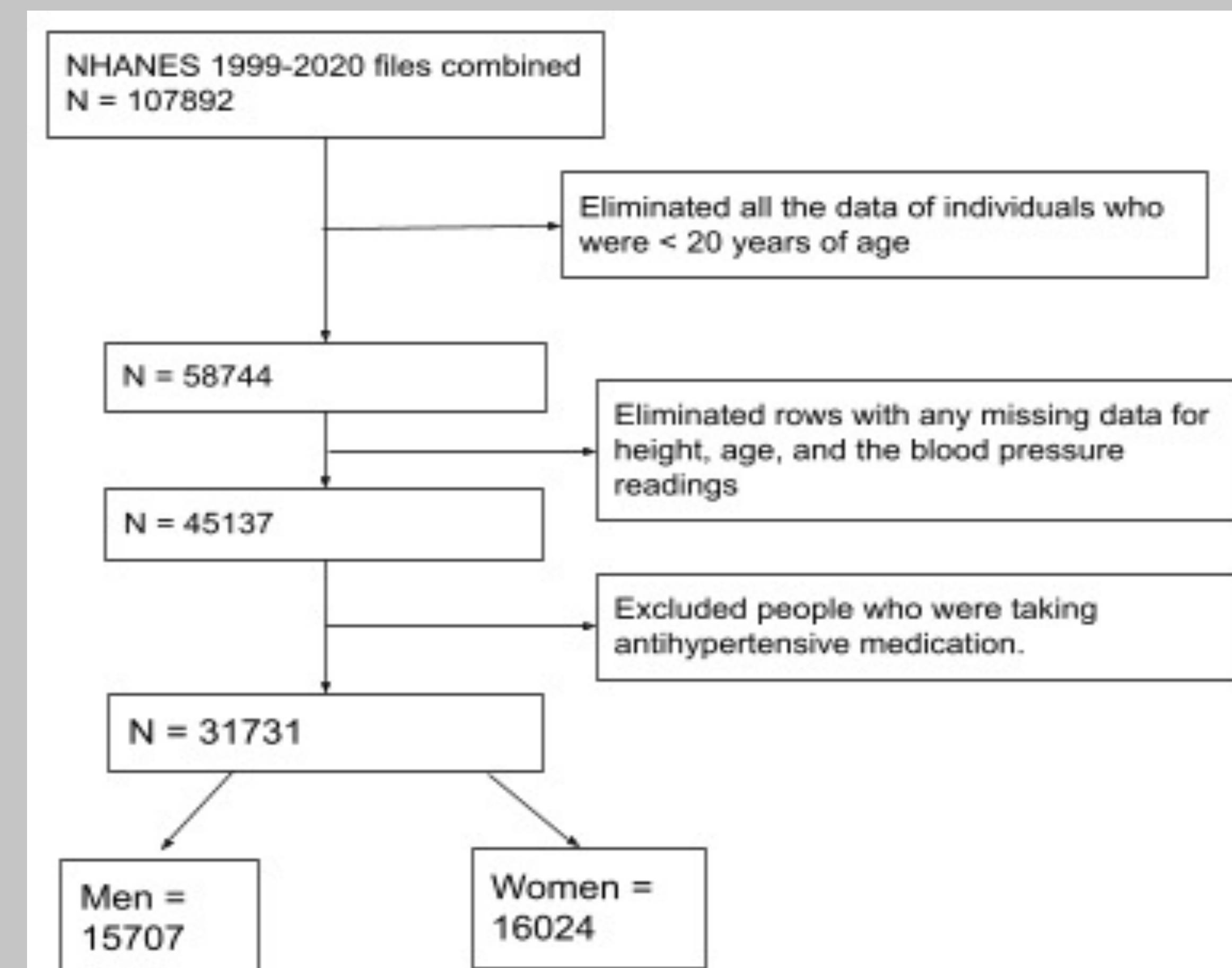
Objectives

The goal of this research were:

- Clean the raw dataset from NHANES into a file that can be used of statistical analysis
- Explore any factors associated with blood pressure, such as age, height, sex, smoking and alcohol consumption
- to determine whether age modified this association between standing height and hypertension

Methods

This study used the National Health and Nutrition Survey (NHANES) to obtain the raw data spanning from 1999-2020. NHANES is a nationally representative survey of the non-institutionalized, civilian U.S. population. It employs a multistage, probability design. The datasets were in two-year cycles.



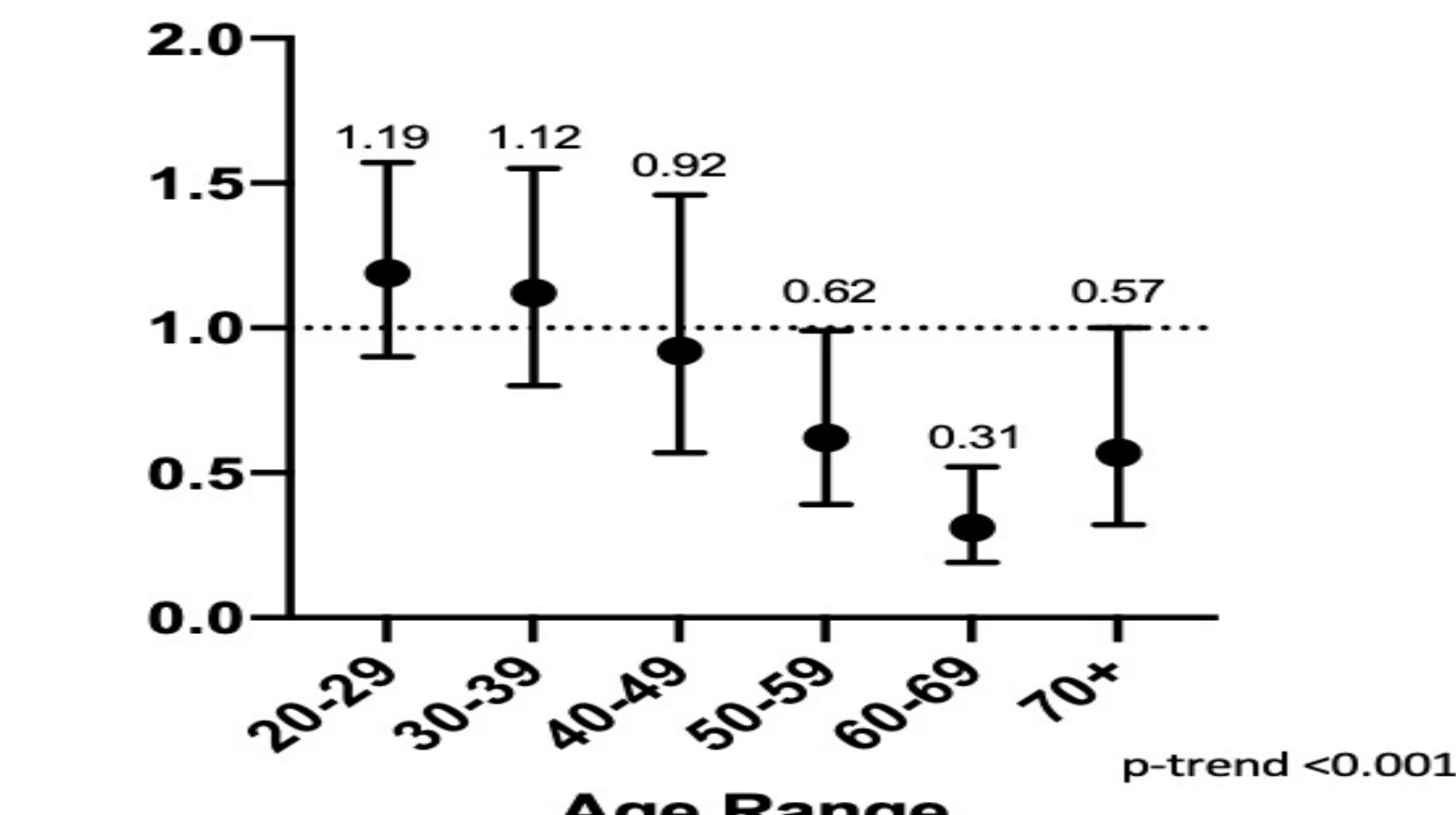
In order to determine the age specific difference, we categorized standing height into sex-specific quartiles. We modelled the correlation and estimated the ratios using multivariate logistic regression, adjusting for covariates, accounting for the complex survey design, and stratifying by 10-year age group

Future Directions

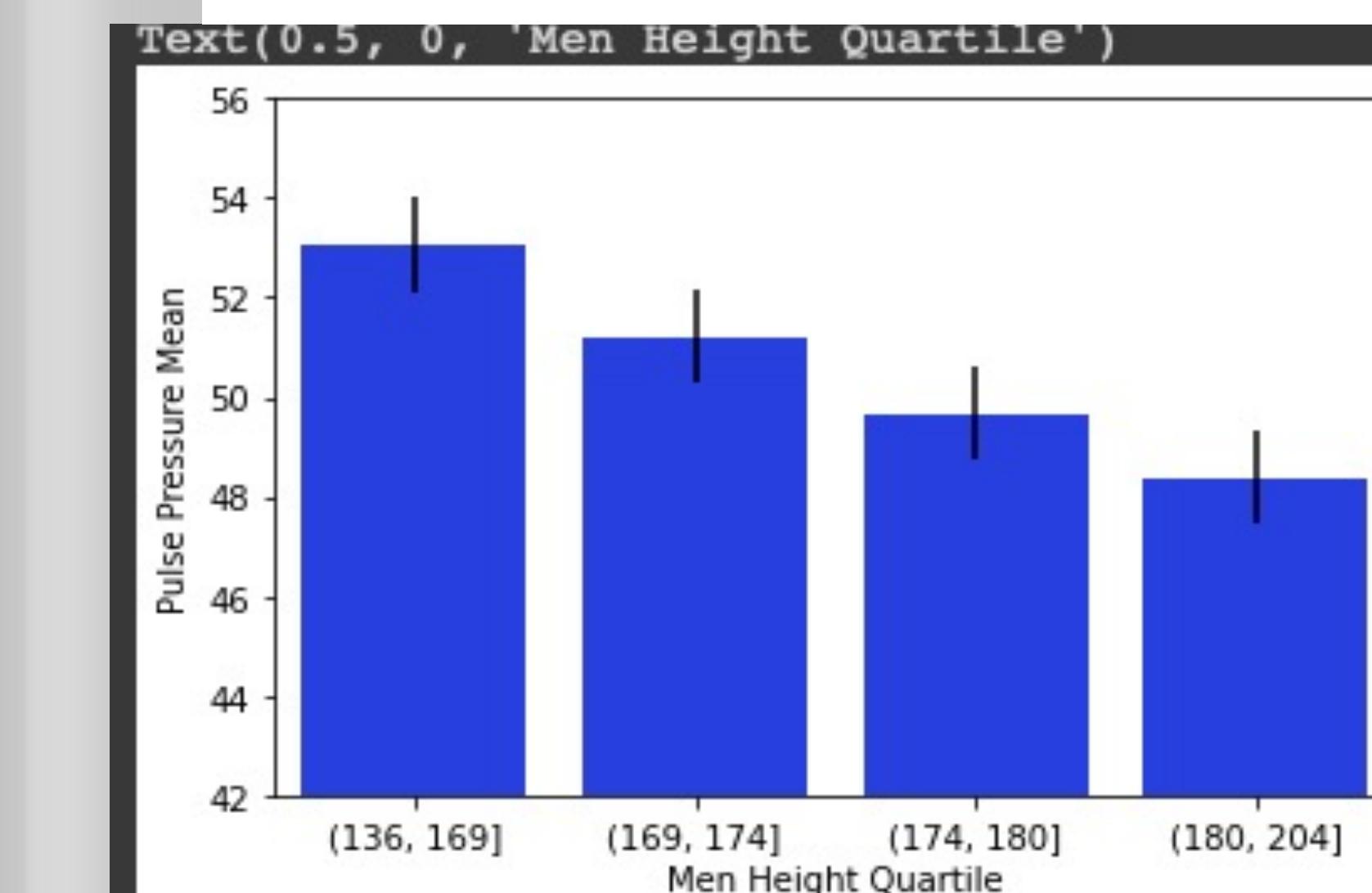
For further directions, we will determine whether potential confounders (demographics, social-behavioral characteristics, comorbidities, and health service factors) attenuate the association between height and pulse pressure and look to see how age will modify this effect. After analyzing the important associations and factors for hypertension, we plan to build a machine learning model that could provide the probability of an individual being diagnosed with blood pressure given his specific characteristics.

Results/Discussion

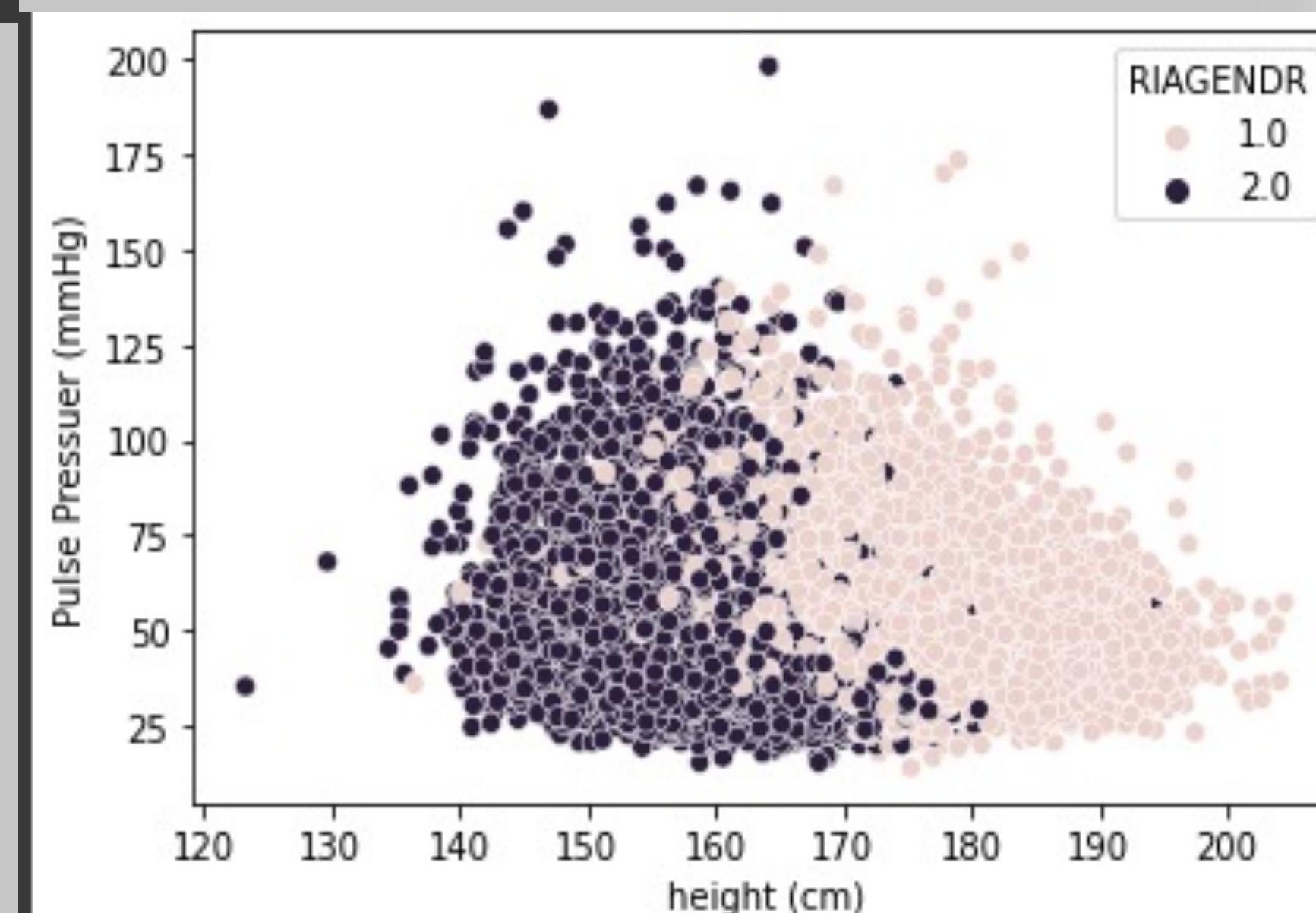
Q4 vs. Q1 Height Odds Ratio (95% CI)



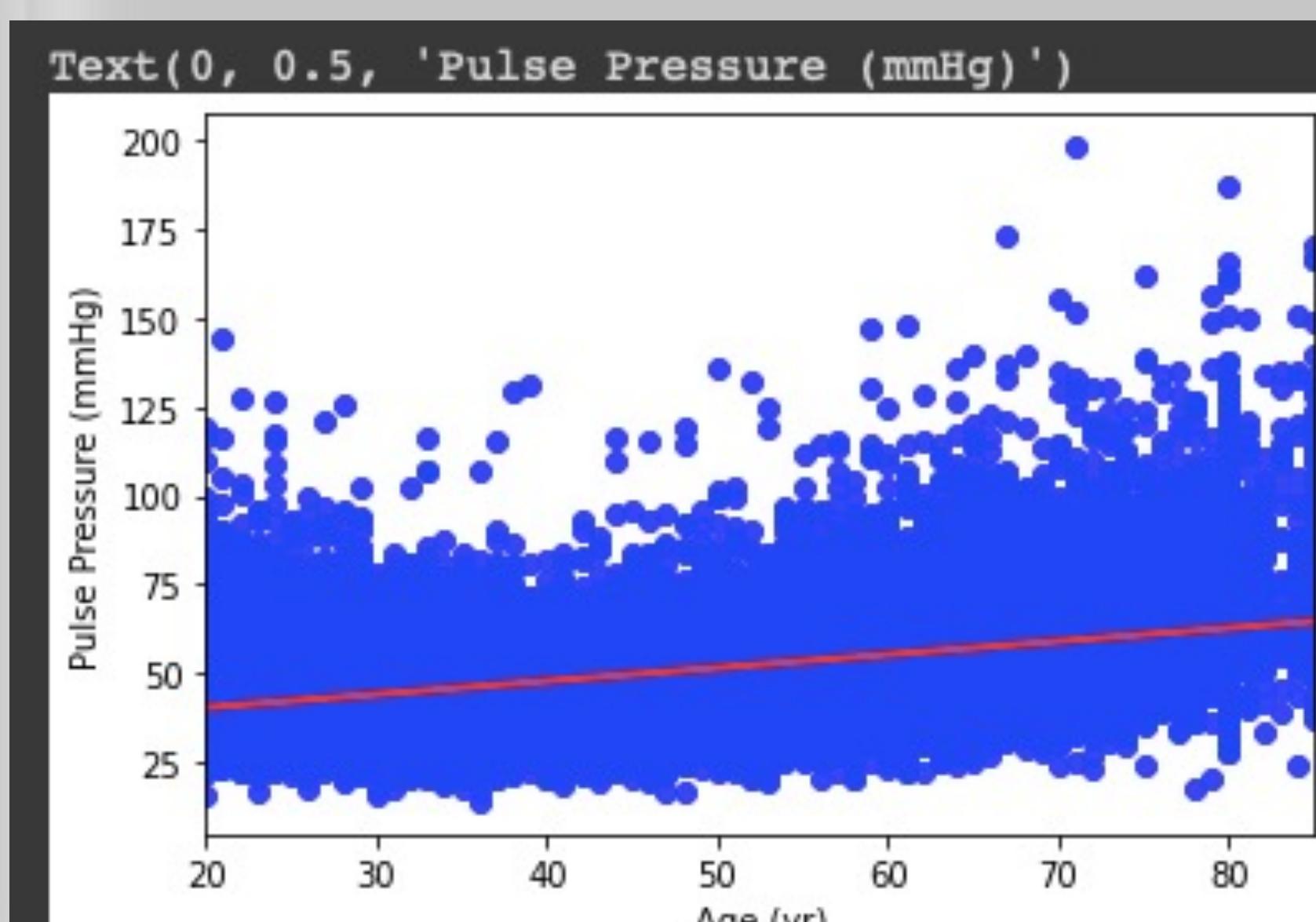
20-29 yrs': 1.19 [0.9 1.57], '30-39': 1.12 [0.80, 1.55], '40-49': 0.92 [0.57, 1.46],
'50-59': 0.62 [0.39, 0.99], '60-69': 0.31 [0.19, 0.52], '70+'. 0.57 [0.32, 1.00];



The chart on the left indicates the inverse relationship between height and pulse pressure when comparing the first quartile to the fourth quartile of standing height. The pulse pressure mean ranges from 45mmHg to 53mmHg from the quartiles.



The height vs. pulse pressure scatter plot, specified by gender, indicates how the two clusters form in this relationship. While there is no clear linear association, there is a slight downward trend as height increases



The chart on the left represents the age vs. pulse pressure relationship. As the graph demonstrates, there exists a slight positive association between the two variables, given the correlation coefficient of 0.409.