Report Title: Example Report

Group 3
Department / Course

November 12, 2025

Contents

##Abstract A short summary of the report — 1 paragraph. Keep it concise and informative. ##Introduction Explain goals, context, dataset, or background. ##Methods Describe methods used. Show code chunks inline as needed.

1 Advantage of current method

simpler model with only one parameter(beta), easier to calculate, suitable for no dataset situations
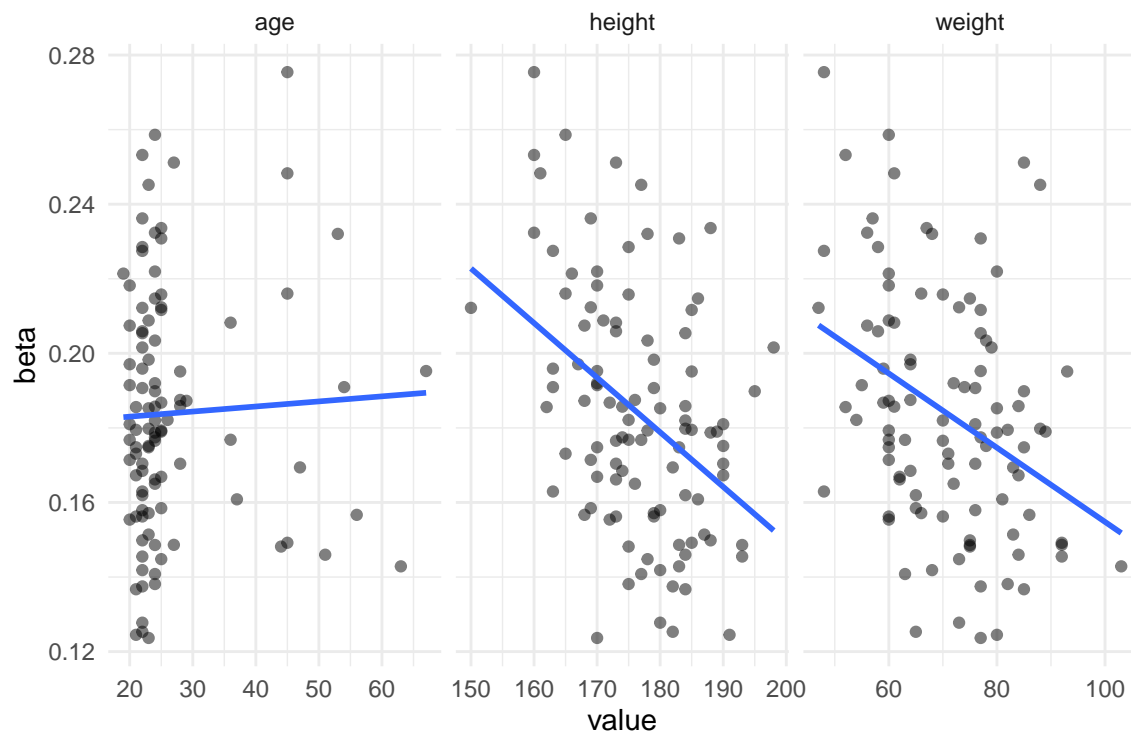
2 Motivations: Need improve? Why?

3 Disadvantage of current method

1. beta is fixed for all individuals, we need to consider the heterogeneity in individuals.
2. Deviated aim: Police Scotland aims at assessing the probabilities that a person is over the limit, while the parameter beta only concentrates on the range between 2.5% and 97.5%.

4 New method: build a linear regression model for beta

Check if age, weight and height have linear relationships with beta. Or have any patterns?

#

Model selection: use drop(), look into AIC and R^2

5 Hypothesis test(70yr female example-better use 2.5th quantile?):

H0: C0 < limit, H1: C0 > limit

6 Calculate V_d:

in the Widmark's equation assumption, beta and V_d are independent, so we need to check whether Cov(V_d, beta) = 0

7 Further research:

casual effect: biased data selection, (e.g. inner correlations between sex and height)