HW1-Effect of Vitamin C on Tooth Growth in Guinea Pigs

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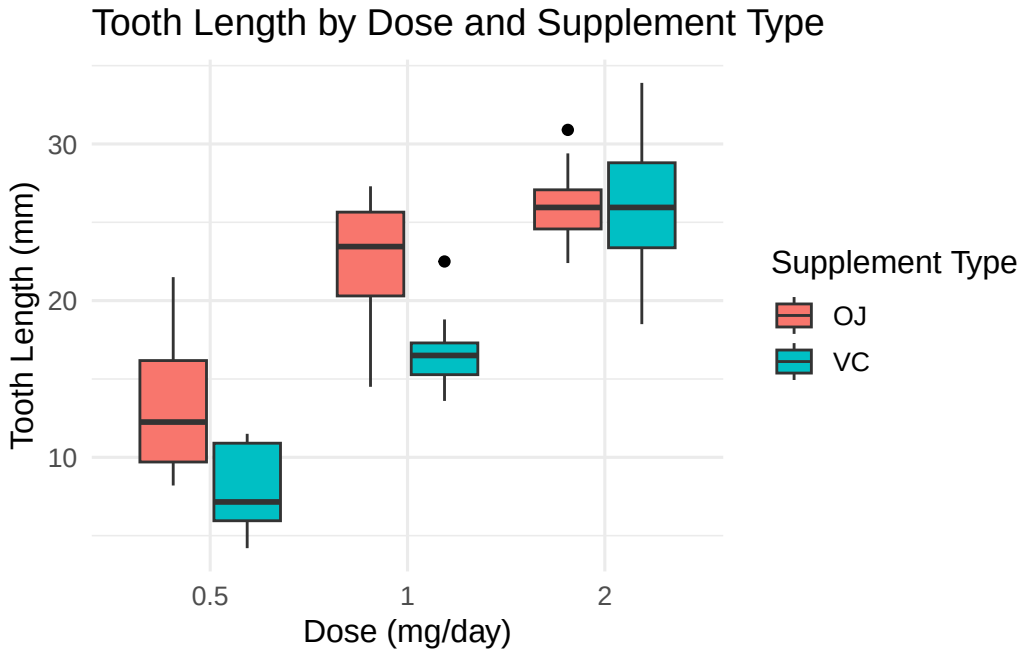
Introduction

The Tooth-Growth dataset, available in R, studies the impact of **vitamin C** on **tooth length** in guinea pigs. Two supplement types were tested: Orange Juice (OJ) and Ascorbic Acid (VC), across three dose levels: 0.5, 1.0, and 2.0 mg/day.

Plotting the Data

Below is a boxplot showing how **tooth length** changes across different **dose levels** and **supplement types**.



The boxplot illustrates how vitamin C dosages is directly proportional to tooth growth. Notably:

- Orange juice seems to work better than ascorbic acid at **0.5 mg per day**.
- At **1.0 mg per day**, the difference decreases.

The effects of both supplements are comparable at **2.0 mg/day**.

These results imply that at low dosages, the mode of distribution is important, but at higher dosages, the total amount of vitamin C becomes the primary consideration.

Descriptive Statistics

Summary of the tooth-length grouped by supplement type and dose:

Table 1: Mean Tooth Length by Supplement and Dose (mg/day)

supp	dose	Mean_Length
OJ	0.5	13.23
OJ	1.0	22.70
OJ	2.0	26.06
VC	0.5	7.98
VC	1.0	16.77
VC	2.0	26.14

Summary Explanation

- **Tooth length increases with dose** for both supplements.
- **Orange Juice (OJ)** consistently leads to **higher tooth growth** than **Ascorbic Acid (VC)** at **0.5 mg** and **1.0 mg** doses.
- At **2.0 mg/day**, both OJ and VC result in **similar mean tooth lengths** (~26 mm), showing that the **effect of dose dominates** at higher levels.