Statistical Inference: Project - Part 2

Piotr Brdeja

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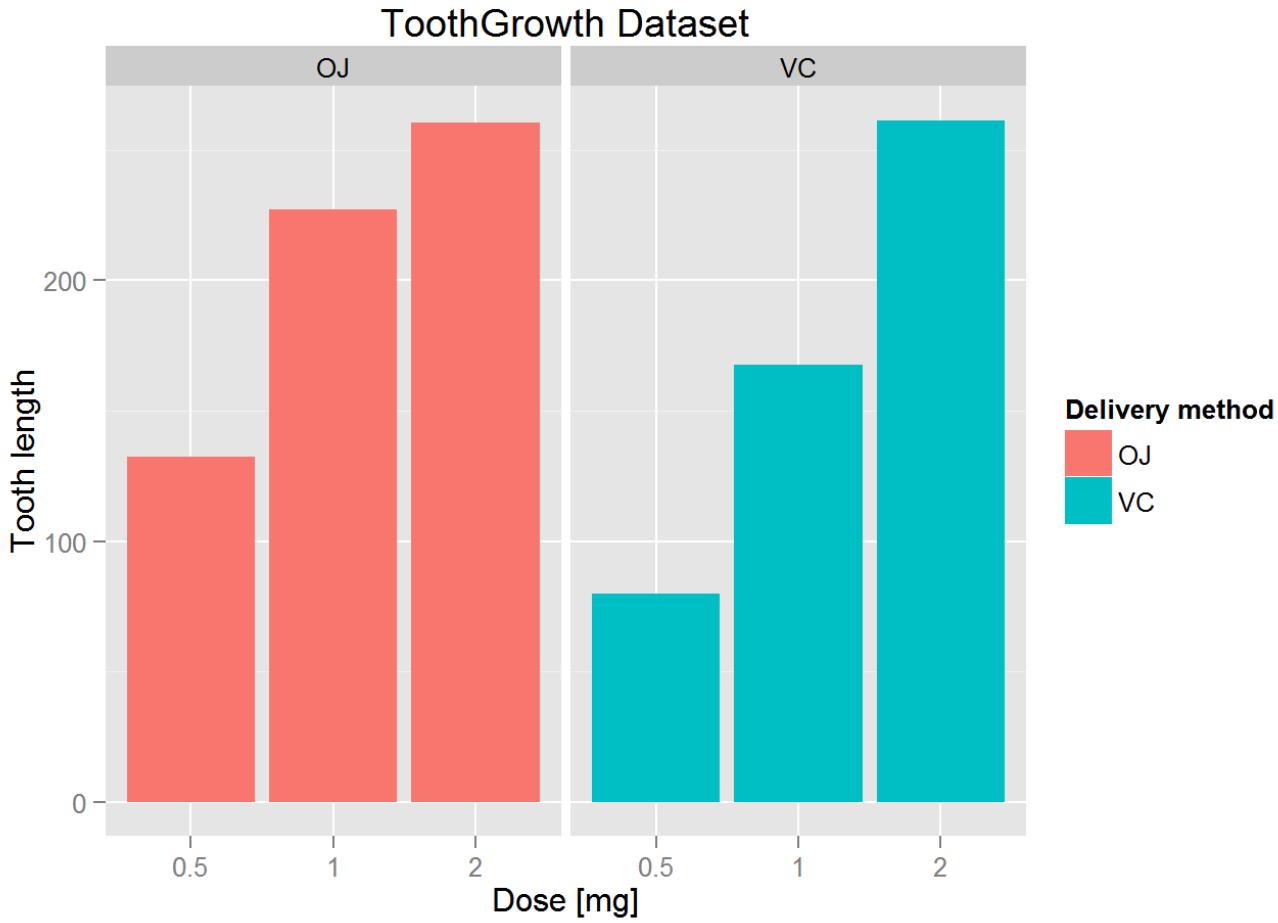
Overview

The analysed data set contains the response is the length of odontoblasts (teeth) in each of 10 guinea pigs at each of three dose levels of Vitamin C (0.5, 1, and 2 mg) with each of two delivery methods (orange juice or ascorbic acid).

```
head(ToothGrowth)
```

```
##    len supp dose
## 1  4.2   VC  0.5
## 2 11.5   VC  0.5
## 3  7.3   VC  0.5
## 4  5.8   VC  0.5
## 5  6.4   VC  0.5
## 6 10.0   VC  0.5
```

Basic exploratory analysis



It is very easy to notice that dose of the Vitamin C has an impact on the tooth length of guinea pigs. It's unclear which delivery method is better. For this we need to verify hypothesis and find out which delivery method is better.

Summary

```
summary(ToothGrowth)
```

```
##       len        supp         dose
##  Min.   : 4.20   OJ:30   Min.   :0.500
##  1st Qu.:13.07   VC:30   1st Qu.:0.500
##  Median :19.25           Median :1.000
##  Mean   :18.81           Mean   :1.167
##  3rd Qu.:25.27           3rd Qu.:2.000
##  Max.   :33.90           Max.   :2.000
```

Tooth growth by supp and dose comparison

```
OJ <- ToothGrowth[ToothGrowth$supp == "OJ",]
VC <- ToothGrowth[ToothGrowth$supp == "VC",]
t.test(x = OJ$len, y = VC$len)
```

```
##
##  Welch Two Sample t-test
##
## data:  OJ$len and VC$len
## t = 1.9153, df = 55.309, p-value = 0.06063
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -0.1710156  7.5710156
## sample estimates:
## mean of x mean of y
##  20.66333  16.96333
```

The null hypothesis states that the delivery method has no impact on tooth growth. The alternative hypothesis says that true difference in means is not equal to 0, hence one method is better than the other. With results from the above and p-value = 0.06063 with alfa = 0.05 we fail to reject the null hypothesis.