ToothGrowth

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Introduction

In this report we will examine the effect of Vitamin C on Tooth Growth in Guinea Pigs. Each animal received one of three dose levels of vitamin C (0.5, 1, and 2 mg/day) by one of two delivery methods, orange juice or ascorbic acid.

Basic data exploration

60 Guinea pigs were followed in the study. These 60 pigs were randomly assigned to one of the six combinations of dose and delivery method.

```
library(datasets)
str(ToothGrowth)
```

```
## 'data.frame':    60 obs. of  3 variables:
##  $ len : num  4.2 11.5 7.3 5.8 6.4 10 11.2 11.2 5.2 7 ...
##  $ supp: Factor w/ 2 levels "OJ","VC": 2 2 2 2 2 2 2 2 2 2 ...
##  $ dose: num  0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 ...
```

```
table(ToothGrowth$supp,ToothGrowth$dose)
```

```
##
##      0.5  1  2
##   OJ  10 10 10
##   VC  10 10 10
```

There are no missing values for the toothlength recordings. The tooth length varied from 4.20 to 33.90 with an average of 18.81.

```
sum(is.na(ToothGrowth$len))
```

```
## [1] 0
```

```
summary(ToothGrowth$len)
```

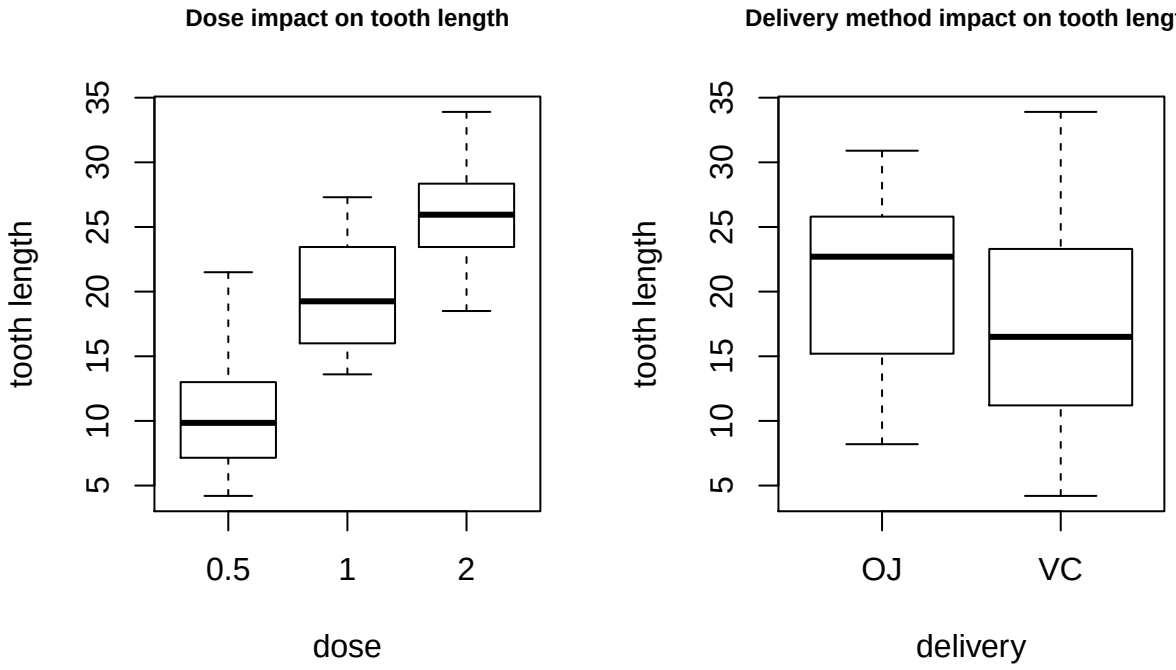
```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    4.20   13.08   19.25   18.81   25.28   33.90
```

Data summary

Higher doses of Vitamin C lead to higher tooth lengths. Although the median tooth length of asorbic acid is lower than the median tooth length of vitamin C supplied via orange juice, it also has a larger variability in outcome. Therefore it is at this stage unclear whether one can conclude that vitamin C delivery via orange juice leads to larger teeth than vitamin C supplied by asorbic acid.

boxplot maken van length per supp & dose

```
par(mfrow=c(1,2),cex.main=0.75)
boxplot(len ~dose, data=ToothGrowth, xlab="dose", ylab="tooth length", main="Dose impact on tooth lengt
boxplot(len ~supp, data=ToothGrowth, xlab="delivery", ylab="tooth length", main="Delivery method impact
```



Is tooth growth dependent onn supp and dose ?

Conclusions