statInferenceReport2

BMc

Saturday, February 21, 2015

Overview

The purpose of this report is to analyze the ToothGrowth data from the R datasets package and state any conclusions which can be drawn.

In this case, an analysis was done specifically to determine the better delivery option for vitamin C to stimulate growth of teeth in guinea pigs: orange juice or ascorbic acid.

Data Summary

```
library(ggplot2)
head(ToothGrowth)
```

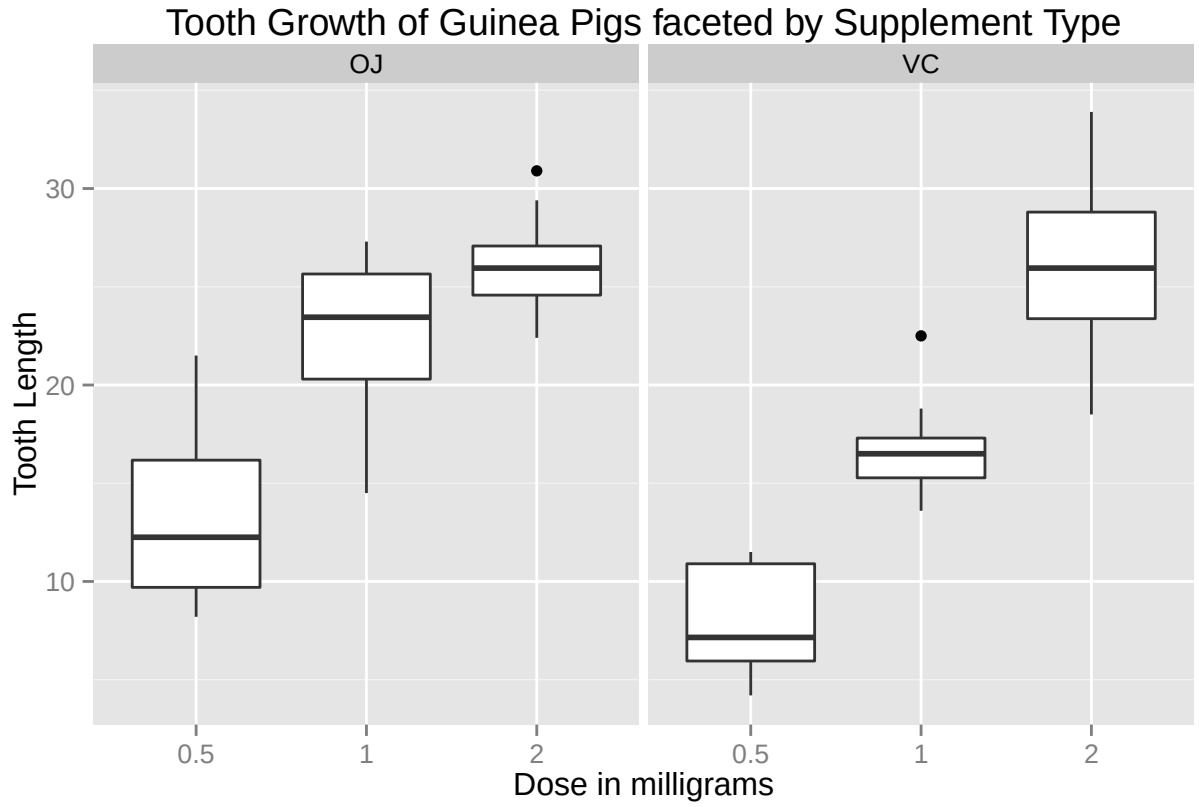
```
##    len supp dose
## 1  4.2   VC  0.5
## 2 11.5   VC  0.5
## 3  7.3   VC  0.5
## 4  5.8   VC  0.5
## 5  6.4   VC  0.5
## 6 10.0   VC  0.5
```

```
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
```

Comparison of tooth growth

```
data_plot <- ggplot(ToothGrowth, aes(factor(dose),len))
data_plot <- data_plot + geom_boxplot() + facet_grid(. ~ supp) + labs(title="Tooth Growth of Guinea Pigs
data_plot
```




```
var(ToothGrowth[ToothGrowth$dose == 2 & ToothGrowth$supp == "VC",1])
```

```
## [1] 23.01822
```

```
var(ToothGrowth[ToothGrowth$dose == 2 & ToothGrowth$supp == "OJ",1])
```

```
## [1] 7.049333
```

Conclusions

As shown above, the tooth growth for lower doses of OJ is much higher than the comparable amount for Ascorbic Acid, with up to three quarters of the readings showing longer tooth length in guinea pigs getting vitamin C from orange juice. However, at a dose of 2 mg, the readings for ascorbic acid show a larger range which may indicate a better delivery mechanism than the comparable amount delivered via orange juice. Unfortunately, due to higher variability, this may not be ideal in a test environment if an expected growth amount is required.

Assumptions for conclusion

It is assumed that the data points collected are independent random observations and that the changes in tooth growth are connected solely to the delivery mechanism of Vitamin C and the dosage amount.