Write-up for the Beat the Blues Data

Eric Reed, Sarah Nunez, Yiding Zhang, Kostis Gourgoulius
University of Massachusetts, Amherst

February 3, 2014

1 Background

This is a dataset containing information from a clinical trial with "Beat the Blues", an interactive multimedia program of cognitive-behavioural techniques. Since there are way more patients suffering from anxiety and depression than therapists, the study of the dataset makes the case that this program can indeed help with the treatment. One of the metrics used to gauge depression levels was BDI or Beck Depression Inventory.

The dataset contains one hundred observations of one hundred patients and eight variables. BDI was tracked before treatment, after two months and then after one, three and six month follow-ups. Two groups are studied, one that uses the BtB program and one that has the usual anti-depression treatment. Those can be further splitted to sub-groups of patients that were taking anti-depressant drugs.

Here is a summary of the dataset.

```
library(ggplot2)
library(MASS)
library(HSAUR2)

## Loading required package:  tools


BtheB <- BtheB
attach(BtheB)
summary(BtheB)

##   drug    length   treatment     bdi.pre          bdi.2m          bdi.3m
##  No :56   <6m:49   TAU  :48   Min.   : 2.0   Min.   : 0.0   Min.   : 0.0
##  Yes:44   >6m:51   BtheB:52   1st Qu.:15.0   1st Qu.: 8.0   1st Qu.: 6.0
##                               Median :22.0   Median :15.0   Median :13.0
##                               Mean   :23.3   Mean   :16.9   Mean   :14.8
##                               3rd Qu.:30.2   3rd Qu.:23.0   3rd Qu.:20.0
##                               Max.   :49.0   Max.   :48.0   Max.   :53.0
```

```
##                                                 NA's   : 3.0   NA's   :27.0
##      bdi.5m         bdi.8m
##  Min.   : 0.0   Min.   : 0.0
##  1st Qu.: 3.0   1st Qu.: 3.0
##  Median :10.0   Median :10.5
##  Mean   :12.8   Mean   :11.1
##  3rd Qu.:20.0   3rd Qu.:15.2
##  Max.   :47.0   Max.   :40.0
##  NA's   :42.0   NA's   :48.0
```

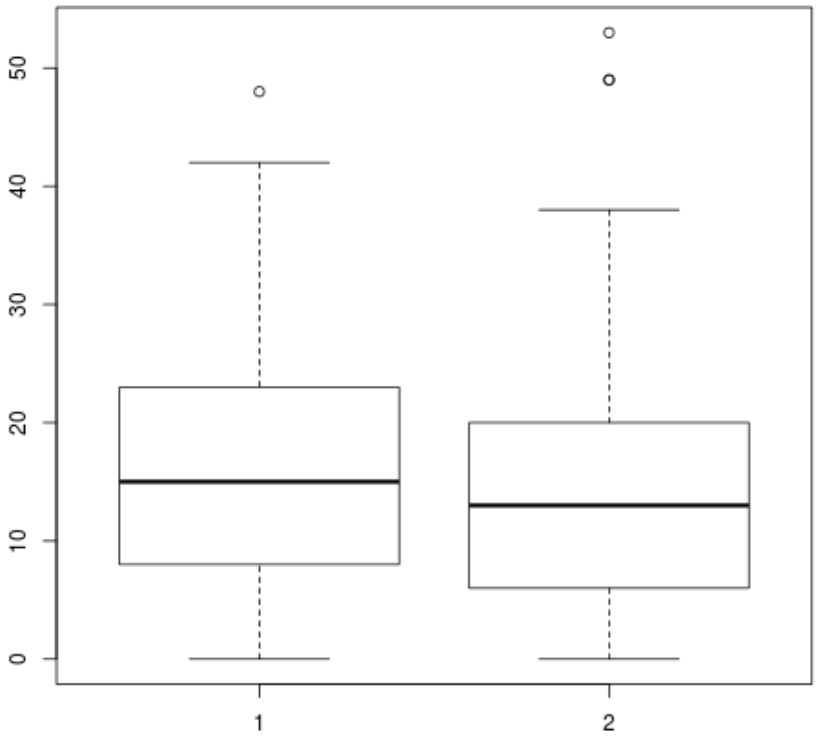
2 Variables and Hypothesis

The variables we chose to work with were bdi.2m and bdi.3m, which were the Beck Depression Inventory II test results of the 100 patients after two months and after three months, respectively.

“‘r library(ggplot2) library(MASS) library(HSAUR2)

BtheB ¡- BtheB attach(BtheB) “‘ The following summarizes all 8 variables and displays side-by-side boxplots of the two variables bdi.2m and bdi.3m. “‘r summary(BtheB) boxplot(bdi.2m, bdi.3m) “‘ As displayed in the boxplots, the median score on the BDI test at the two month follow-up was slightly higher than that at the three month follow-up.

```
plot(bdi.3m ~ bdi.2m)
m2m3m <- lm(bdi.3m ~ bdi.2m, data = BtheB)
abline(m2m3m)
```




```
summary(m2m3m)

##
## Call:
## lm(formula = bdi.3m ~ bdi.2m, data = BtheB)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -24.261  -4.697  -0.338   2.585  22.534
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)   0.9784     1.5321    0.64     0.53
## bdi.2m        0.8718     0.0802   10.87   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
## Residual standard error: 7.29 on 71 degrees of freedom
##   (27 observations deleted due to missingness)
## Multiple R-squared: 0.625,Adjusted R-squared: 0.619
## F-statistic:  118 on 1 and 71 DF,  p-value: <2e-16
```

3 Missing Data

```
##       bdi.2m bdi.3m Both
## TAU        3     12    3
## BtheB      0     15    0
## Total      3     27    3
## [1] 73
## [1] 36
## [1] 37
```

The 3 that are missing from the m2 data are also missing from the m3 data, so we have 73 useuable observations. Of these 73 we have a close number for each treament; 36 had the treatment TAU and 37 had the treatment, "BtheB". It's nice that we have a almost even number of participants in each group. Though the sample size seems too small, it is far better than if we had used either of the last 2 variables.

4 Results and Interpretation