

# An analysis of 2016 election turnout

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```
platform      _  
x86_64-apple-darwin16.0.0  
version.string R version 3.3.1 (2016-06-21)
```

I plot raw vote numbers cast for the Democratic and Republican presidential candidate in each state. The baseline is the 2008 election. I compare it with the 2012 and 2016 elections. The 2008 and 2012 data are the final certified vote counts downloaded from <https://www.archives.gov/federal01register/electoral01college/2008/index.html> and <https://www.archives.gov/federal01register/electoral01college/2012/index.html>. The 2016 data are preliminary counts from <http://uselectionatlas.org/RESULTS/>. The analyses can be reproduced by running `Sweave()` on the `turnout.Rnw` file in R.

I start by reading in the data.

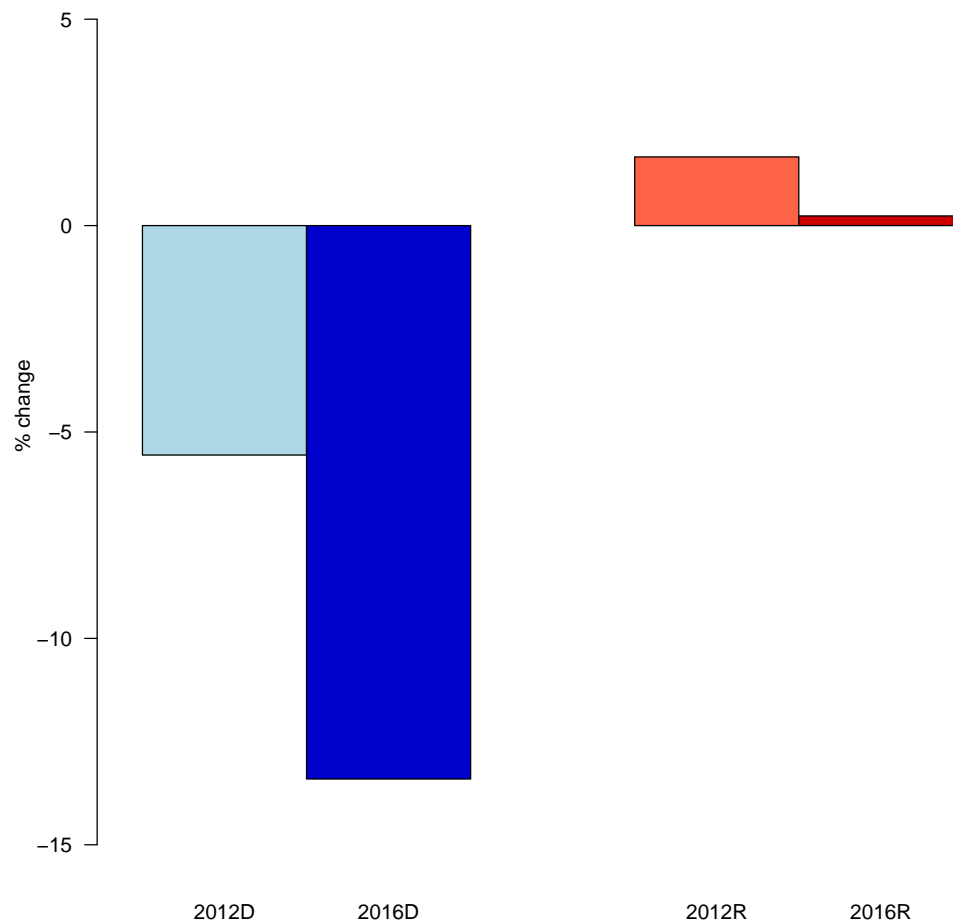
```
> res2008 <- read.table("results2008.txt", header = T, sep = "\t", comment.char = "#")  
> res2012 <- read.table("results2012.txt", header = T, sep = "\t", comment.char = "#")  
> res2016 <- read.table("results2016.txt", header = T, sep = "\t", comment.char = "#")
```

Calculate the percent change from 2008.

```
> dm <- rbind((res2012$Dem/res2008$Dem - 1.0)*100, (res2016$Dem/res2008$Dem - 1.0)*100)  
> rp <- rbind((res2012$Rep/res2008$Rep - 1.0)*100, (res2016$Rep/res2008$Rep - 1.0)*100)  
> rg <- range(c(dm, rp))  
> nSt <- nrow(res2016) - 1
```

Now plot the nation-wide data.

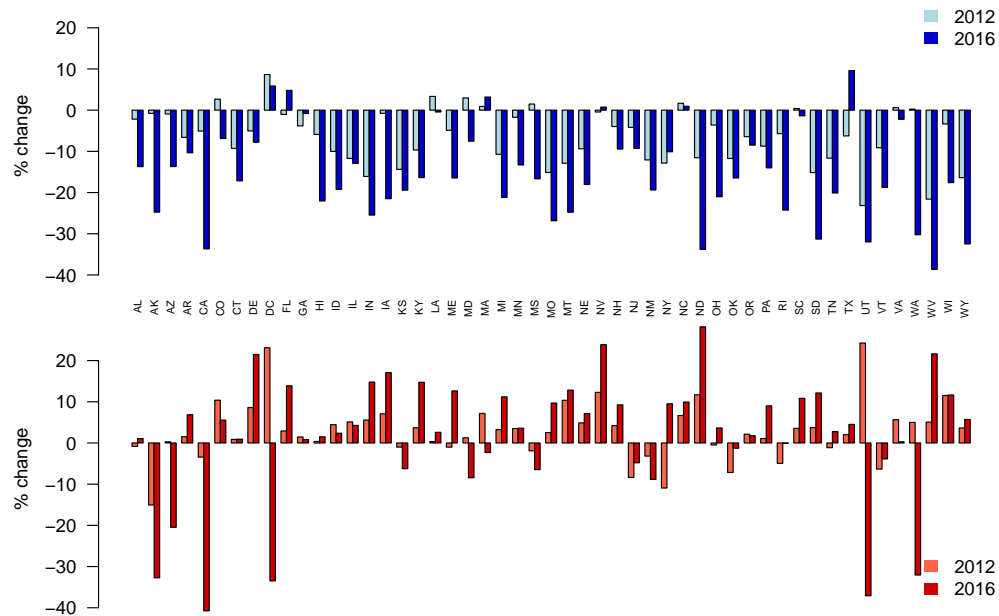
```
> par(mar = c(3.0, 4.0, 0.5, 0.5), mgp = c(3, 1, 0.5))  
> bp1 <- barplot(cbind(dm[,nSt+1], rp[,nSt+1]), beside = T,  
+   ylim = range(c(dm[,nSt+1], rp[,nSt+1])) + c(-2, 5),  
+   col = c("lightblue", "blue3", "tomato", "red3"), las = 1, ylab = "% change")  
> axis(1, las = 1, at = c(bp1), c("2012D", "2016D", "2012R", "2016R"),  
+   lwd = 0.0, tick = F)
```



Next, I plot data for each state. I group them into “red” (Republican), “blue” (Democratic) and “purple” (swing).

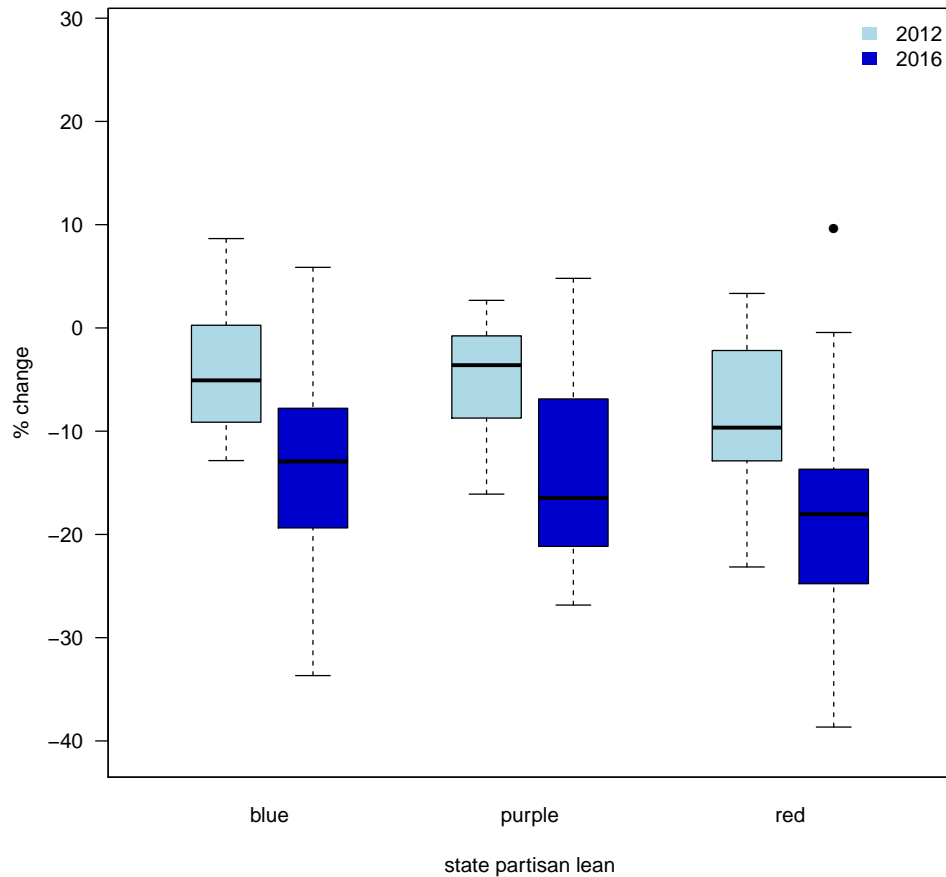
```
> stateNam <- as.character(res2012$State[1:nSt])
> stateCol <- c("red", "red", "red", "red", "blue", "purple", "blue", "blue",
+   "blue", "purple", "red", "blue", "red", "blue", "purple", "purple",
+   "red", "red", "red", "purple", "blue", "blue", "purple", "blue", "red",
+   "purple", "red", "red", "purple", "purple", "blue", "blue", "blue", "purple",
+   "red", "purple", "red", "blue", "purple", "blue", "red", "red", "red",
+   "red", "red", "blue", "blue", "blue", "red", "purple", "red")
> stateGrp <- factor(stateCol)
> par(mfrow = c(2,1), mar = c(0.2, 4, 2, 0.2), mgp = c(3,1,0))
> bp1 <- barplot(dm[,1:nSt], beside = T, col = c("lightblue", "blue3"),
+   ylim = rg, las = 1, ylab = "% change")
> axis(1, at = colMeans(bp1), stateNam, lwd = 0.0, tick = F, cex.axis = 0.6, las = 2)
> legend("topright", c("2012", "2016"), fill = c("lightblue", "blue3"),
+   border = NA, bty = "n")
```

```
> barplot(rp[, 1:nSt], beside = T, col = c("tomato", "red3"),
+       ylim = rg, las = 1, ylab = "% change")
> legend("bottomright", c("2012", "2016"), fill = c("tomato", "red3"),
+       border = NA, bty = "n")
```

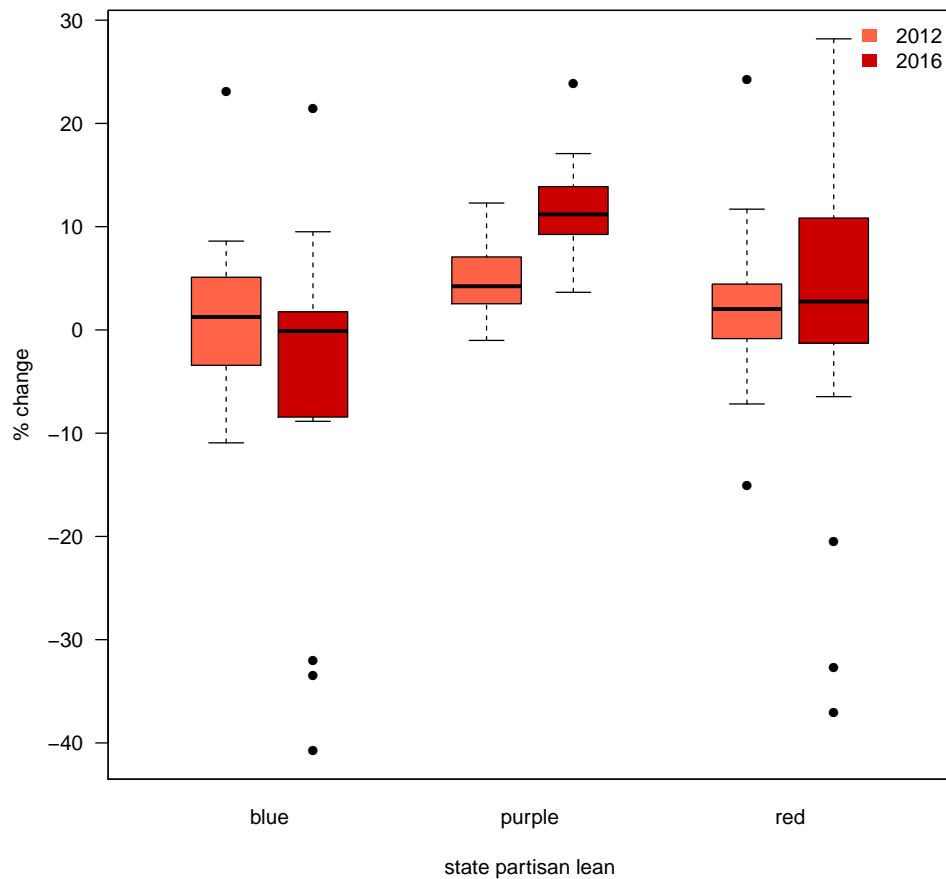


I check the effects of state partisan lean.

```
> boxplot(dm[1, 1:nSt]~stateGrp, pch = 16, las = 1, ylim = rg, xlim = c(0, 9),
+       at = seq(1, 7, 3), col = "lightblue", xaxt = "n", ylab = "% change",
+       xlab = "state partisan lean")
> boxplot(dm[2, 1:nSt]~stateGrp, pch = 16, add = T, at = seq(2, 8, 3), col = "blue3",
+       xaxt = "n", yaxt = "n")
> axis(1, at = seq(1.5, 7.5, 3), c("blue", "purple", "red"), tick = F)
> legend("topright", c("2012", "2016"), fill = c("lightblue", "blue3"),
+       border = NA, bty = "n")
```

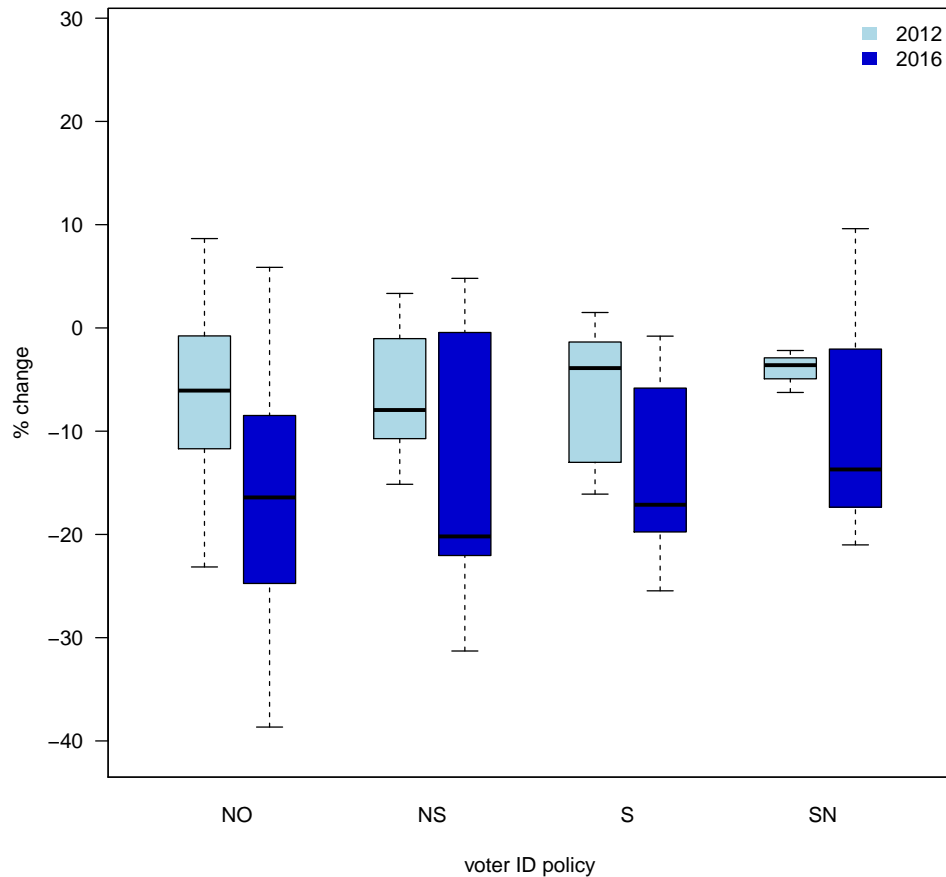


```
> boxplot(rp[1, 1:nSt]~stateGrp, pch = 16, las = 1, ylim = rg, xlim = c(0, 9),
+   at = seq(1, 7, 3), col = "tomato", xaxt = "n", ylab = "% change",
+   xlab = "state partisan lean")
> boxplot(rp[2, 1:nSt]~stateGrp, pch = 16, add = T, at = seq(2, 8, 3), col = "red3",
+   xaxt = "n", yaxt = "n")
> axis(1, at = seq(1.5, 7.5, 3), c("blue", "purple", "red"), tick = F)
> legend("topright", c("2012", "2016"), fill = c("tomato", "red3"),
+   border = NA, bty = "n")
```



Check voter-ID law effects (taken from [https://ballotpedia.org/Voter\\_identification\\_laws\\_by\\_state#tab=Map](https://ballotpedia.org/Voter_identification_laws_by_state#tab=Map)).

```
> voteID <- read.table("photoID.txt", header = T, sep = "\t", comment.char = "#")
> boxplot(dm[1, 1:nSt]~voteID$IDlaw, pch = 16, las = 1, ylim = rg, xlim = c(0, 12),
+   at = seq(1, 10, 3), col = "lightblue", xaxt = "n", ylab = "% change",
+   xlab = "voter ID policy")
> boxplot(dm[2, 1:nSt]~voteID$IDlaw, pch = 16, add = T, at = seq(2, 11, 3), col = "blue3",
+   xaxt = "n", yaxt = "n")
> axis(1, at = seq(1.5, 10.5, 3), levels(voteID$IDlaw), tick = F)
> legend("topright", c("2012", "2016"), fill = c("lightblue", "blue3"),
+   border = NA, bty = "n")
```



```
> boxplot(rp[1, 1:nSt]~voteID$IDlaw, pch = 16, las = 1, ylim = rg, xlim = c(0, 12),
+   at = seq(1, 10, 3), col = "tomato", xaxt = "n", ylab = "% change",
+   xlab = "voter ID policy")
> boxplot(rp[2, 1:nSt]~voteID$IDlaw, pch = 16, add = T, at = seq(2, 11, 3), col = "red3",
+   xaxt = "n", yaxt = "n")
> axis(1, at = seq(1.5, 10.5, 3), levels(voteID$IDlaw), tick = F)
> legend("topright", c("2012", "2016"), fill = c("tomato", "red3"),
+   border = NA, bty = "n")
```

