Google Trends Analysis

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Figure 1

Load the data and store in a data frame.

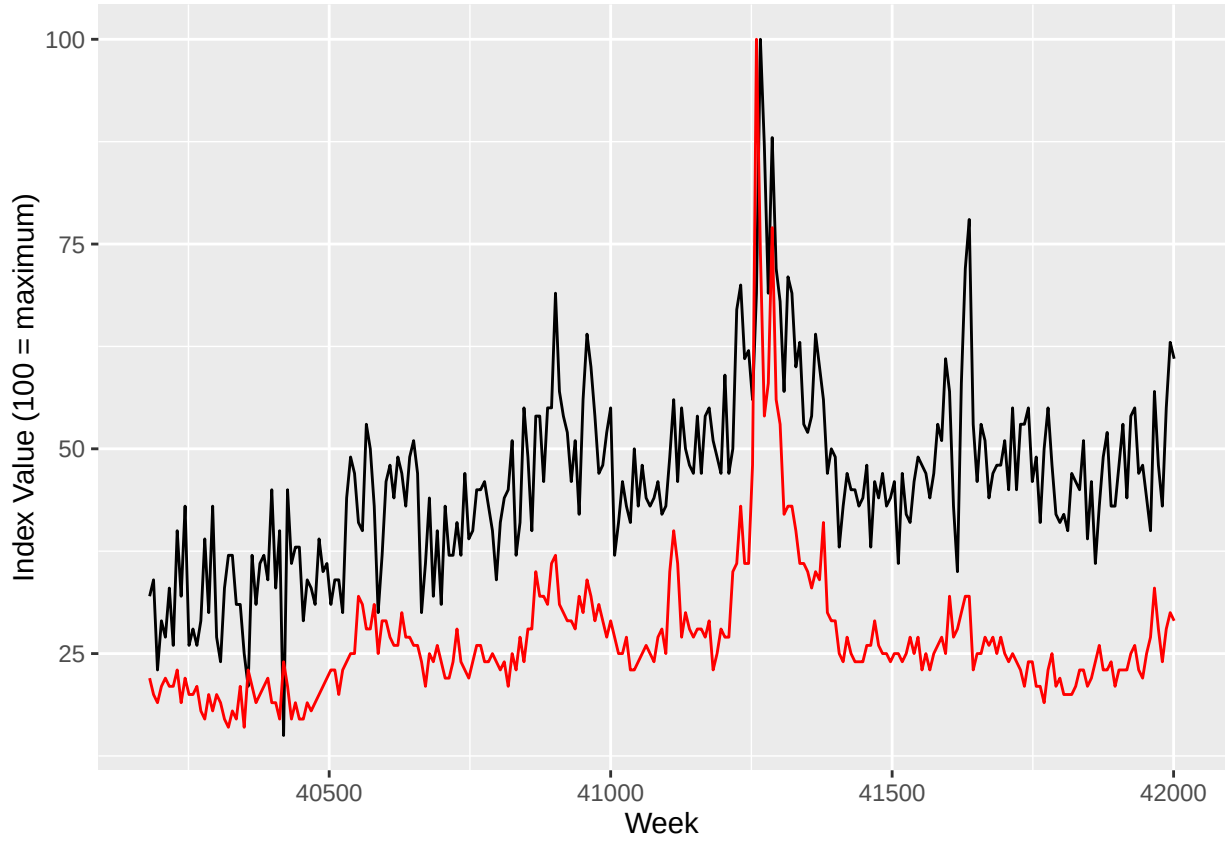
```
load("../data/raw/Google Trends data for Figure 1.RData")
google_trends <- data.frame(x[3:nrow(x),]) # extrude misellaneous header data
colnames(google_trends) <- c("week", "clean", "buy")
```

Cast vaulues to be numeric from string format

```
google_trends$week <- as.numeric(google_trends$week)
google_trends$clean <- as.numeric(google_trends$clean)
google_trends$buy <- as.numeric(google_trends$buy)
```

Replicate Figure 1 from the paper:

```
ggplot(data = google_trends) +
  geom_line(aes(x = week, y = clean), color = "black") +
  geom_line(aes(x = week, y = buy), color = "red") +
  xlab("Week") +
  ylab("Index Value (100 = maximum)")
```



```
ggsave("../writing/figures/fig1_generated.PNG")
```

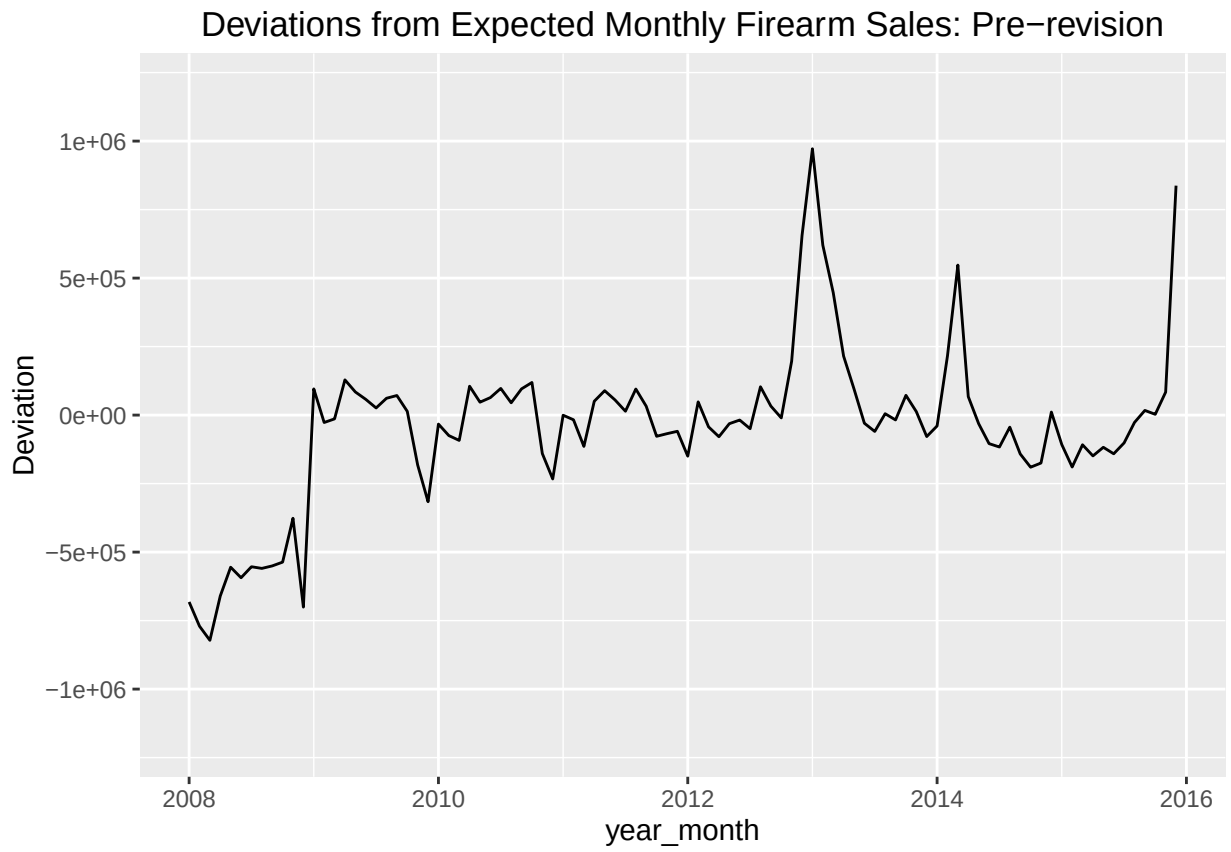
```
## Saving 6.5 x 4.5 in image
```

Figure 2

Figure as-is

```
nat_gun_sales <- read.csv("../output/figure data/fig2_sales.csv")
nat_gun_sales$year_month <- nat_gun_sales$year + (nat_gun_sales$month - 1)/12.0
nat_gun_sales <- filter(nat_gun_sales, year <= 2015)
```

```
ggplot() +
  geom_line(data = nat_gun_sales, aes(x = year_month, y = resid)) +
  ylim(c(-1200000, 1200000)) +
  ylab("Deviation") +
  ggtitle("Deviations from Expected Monthly Firearm Sales: Pre-revision")
```



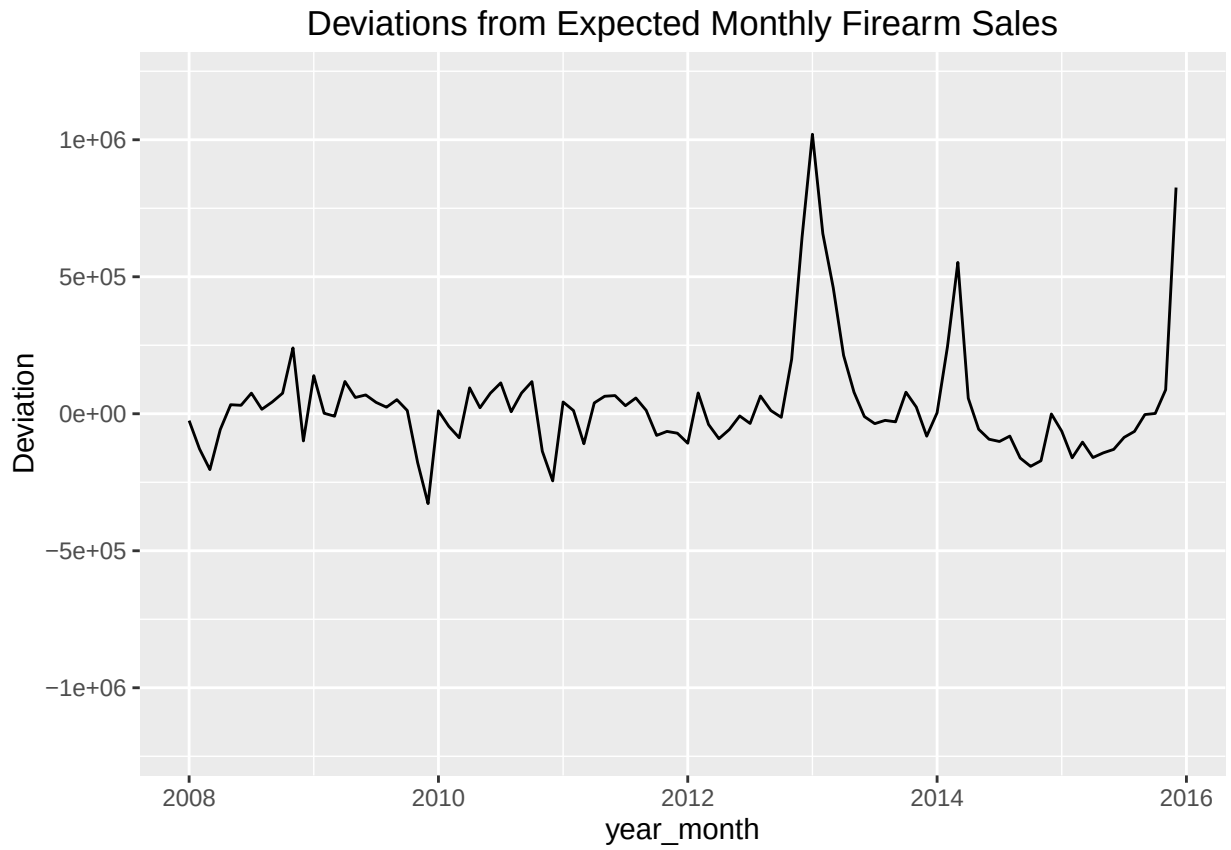

```
ggsave("../writing/figures/fig2_pre_revision.PNG")
```

```
## Saving 6.5 x 4.5 in image
```

Remove 2016 data

```
nat_gun_sales <- read.csv("../output/figure data/fig2_sales_revised.csv")
nat_gun_sales$year_month <- nat_gun_sales$year + (nat_gun_sales$month - 1)/12.0
nat_gun_sales <- filter(nat_gun_sales, year <= 2015)
```

```
ggplot() +
  geom_line(data = nat_gun_sales, aes(x = year_month, y = resid)) +
  ylim(c(-1200000, 1200000)) +
  ylab("Deviation") +
  ggtitle("Deviations from Expected Monthly Firearm Sales")
```




```
ggsave("../writing/figures/fig2_sales.PNG")
```

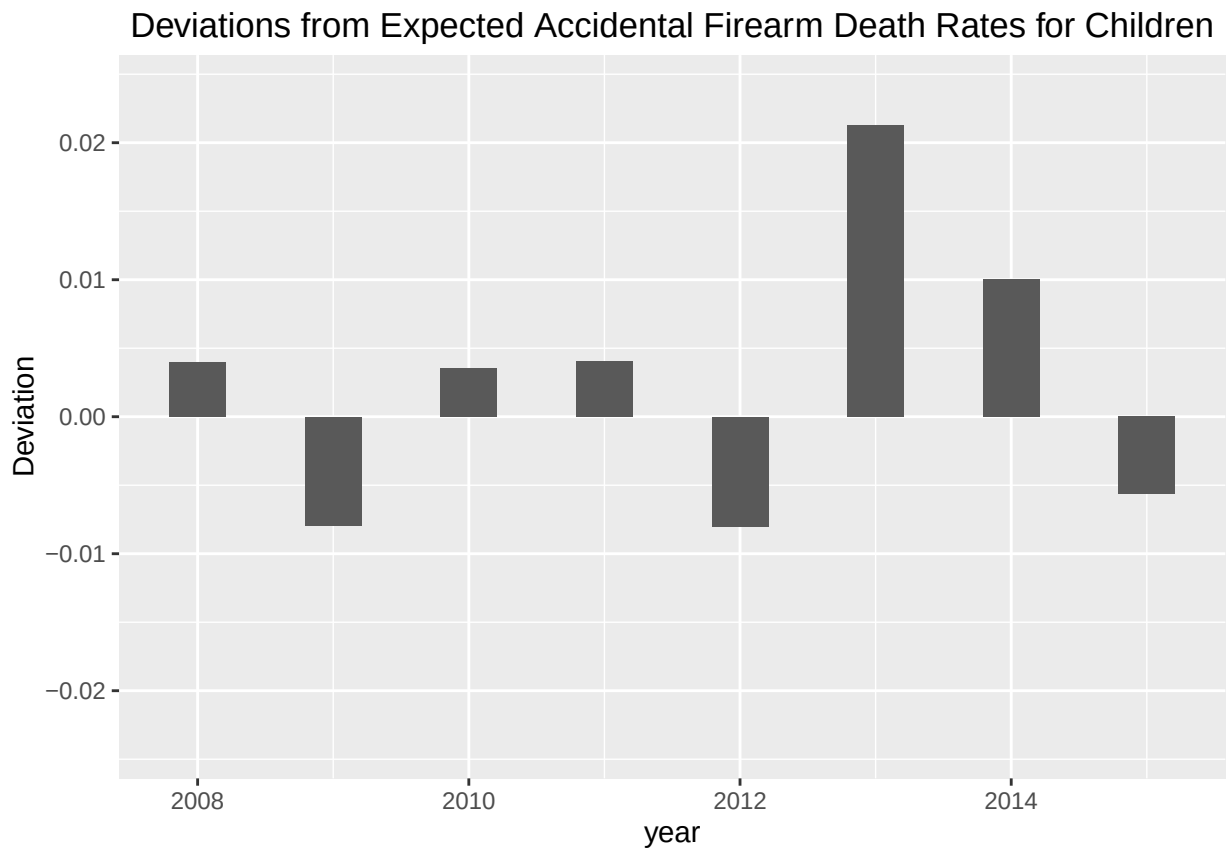
```
## Saving 6.5 x 4.5 in image
```

Load the death data

```
nat_death <- read.csv("../output/figure data/fig2_deaths.csv")
```

```
ggplot(data = nat_death) +
  geom_bar(aes(x = year, weight = resid), width = 0.417) +
  ylim(c(-0.024, 0.024)) +
  ylab("Deviation") +
  ggtitle("Deviations from Expected Accidental Firearm Death Rates for Children")
```

```
## Warning: Stacking not well defined when ymin != 0
```




```
ggsave("../writing/figures/fig2_deaths.PNG")
```

```
## Saving 6.5 x 4.5 in image
```

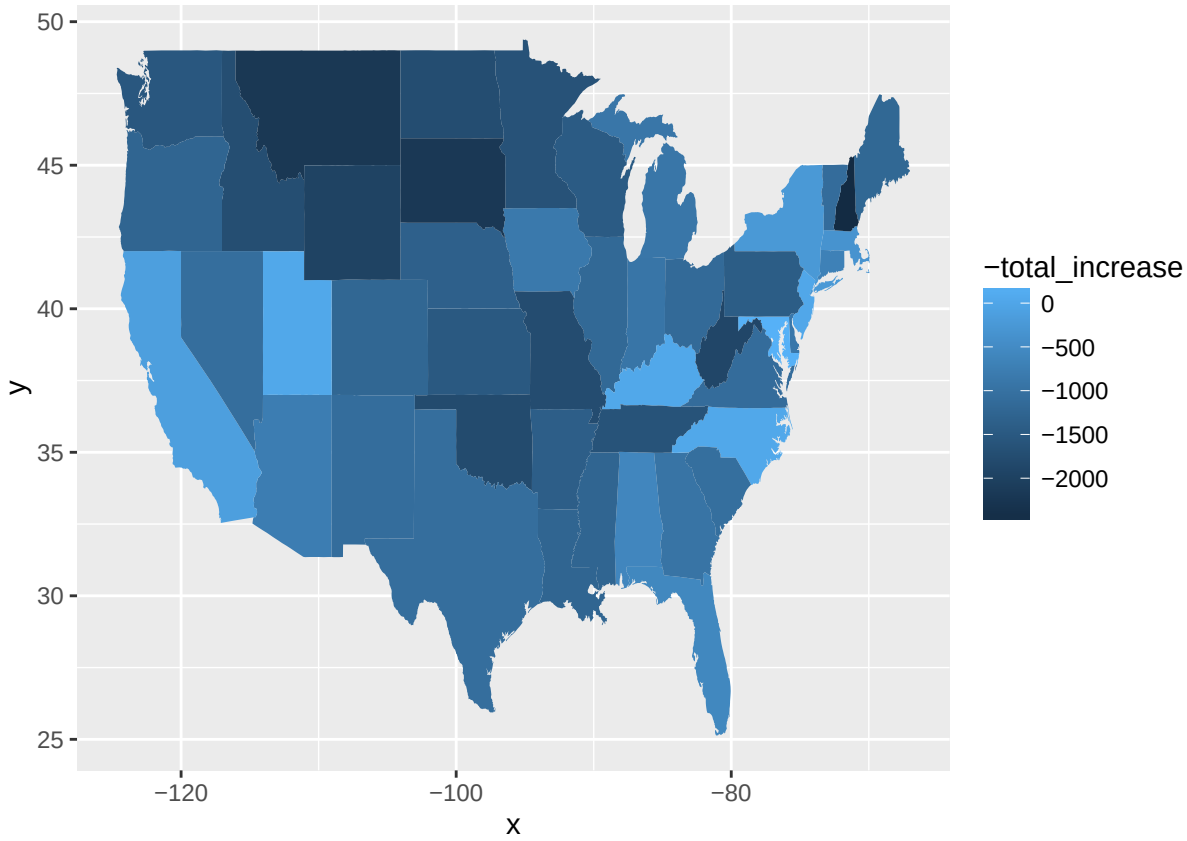
```
## Warning: Stacking not well defined when ymin != 0
```

```
# set bar width to 5 months
```

Figure 3

Setup the dataframe for state level firearm sale increases:

```
states_gun_increase <- read.csv("../output/figure data/fig3.csv")
states_map <- map_data("state")
ggplot(states_gun_increase, aes(map_id = state)) +
    geom_map(aes(fill = -total_increase), map = states_map)+
    expand_limits(x = states_map$long, y = states_map$lat)
```




```
ggsave("../writing/figures/fig3_generated.png")
```

```
## Saving 6.5 x 4.5 in image
```