H1N1 Exploration

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1 Introduction

The goal of this project is to create a visualization of the progression of past epidemic or pandemic viruses throughout their lifetimes. In doing this, we hope to be able to provide a better understanding of not only the rate at which these types of viruses can spread throughout the population, but also the time it takes for scientists to develop and distribute a vaccine or cure for the spreading virus.

2 Dataset Exploration

```
##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union

##
## Attaching package: 'geojsonio'

## The following object is masked from 'package:base':
##
##     pretty
```

```
## here() starts at /Users/josefigueroa/Documents/Interactive Visualization/Project
```

Dimensions:

```
H1N1.df <- here("Data", "Pandemic (H1N1) 2009.csv") %>%
    read.csv()
H1N1.df$Country <- as.character(H1N1.df$Country)
```

```r
Grand.total.df <- H1N1.df %>% filter(Country == "Grand Total")
H1N1.df <- H1N1.df %>% filter(Country != "Grand Total")
```

Dataframe Summary:

```r
glimpse(H1N1.df)
```

```
## Observations: 1,801
## Variables: 4
## $ Country     <chr> "Algeria", "Antigua and Barbuda", "Argentina", "Austral...
## $ Cases       <int> 5, 2, 2485, 5298, 19, 7, 15, 18, 12, 54, 1, 416, 1, 737...
## $ Deaths      <int> 0, 0, 60, 10, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0,...
## $ Update.Time <fct> 7/6/09 9:00, 7/6/09 9:00, 7/6/09 9:00, 7/6/09 9:00, 7/6...
```

```r
summary(H1N1.df)
```

```
##    Country              Cases             Deaths              Update.Time
## Length:1801       Min.   :    1.0   Min.   :  0.000   7/6/09 9:00 : 135
## Class :character  1st Qu.:    3.0   1st Qu.:  0.000   7/3/09 9:00 : 125
## Mode  :character  Median :   13.0   Median :  0.000   7/1/09 9:00 : 120
##                   Mean   :  475.3   Mean   :  2.269   6/29/09 9:00: 116
##                   3rd Qu.:   81.0   3rd Qu.:  0.000   6/26/09 7:00: 112
##                   Max.   :33902.0   Max.   :170.000   6/24/09 7:00: 108
##                                     NA's   :1         (Other)     :1085
```

Head:

```r
head(H1N1.df)
```

Country	Cases	Deaths	Update.Time
Algeria	5	0	7/6/09 9:00
Antigua and Barbuda	2	0	7/6/09 9:00
Argentina	2485	60	7/6/09 9:00
Australia	5298	10	7/6/09 9:00
Austria	19	0	7/6/09 9:00
Bahamas	7	0	7/6/09 9:00

Tail:

```r
tail(H1N1.df)
```

	Country	Cases	Deaths	Update.Time
1796	Sweden	3	0	5/23/09 8:00
1797	Switzerland	2	0	5/23/09 8:00
1798	Thailand	2	0	5/23/09 8:00
1799	Turkey	2	0	5/23/09 8:00
1800	United Kingdom	117	0	5/23/09 8:00
1801	United States of America	6552	9	5/23/09 8:00

Unique Dates:

```r
unique.dates <- levels(H1N1.df$Update.Time)
length(unique.dates)
```

```
## [1] 22
```

```
unique.dates
```

```
##  [1] "5/23/09 8:00"   "5/25/09 8:00"   "5/26/09 6:00"   "5/27/09 8:00"
##  [5] "5/29/09 6:00"   "6/1/09 6:00"    "6/10/09 6:00"   "6/11/09 14:00"
##  [9] "6/12/09 7:00"   "6/15/09 17:00"  "6/17/09 12:00"  "6/19/09 7:00"
## [13] "6/22/09 7:00"   "6/24/09 7:00"   "6/26/09 7:00"   "6/29/09 9:00"
## [17] "6/3/09 6:00"    "6/5/09 6:00"    "6/8/09 6:00"    "7/1/09 9:00"
## [21] "7/3/09 9:00"    "7/6/09 9:00"
```

There are 22 unique weeks to account for. We should look into how to plot on a world map style heatmap (I have an idea on this), and then allowing for the option to traverse time on said heatmap. We can also easily transorm this notebook into a webapp with RShiny

3   Single Date Plot

For this week, we can probably focus on having just 1 week plotted (5/23/2009). Then we can generalize to be interactive through time

```r
country.shapes <- here("Data", "countries.geojson") %>%
  geojson_read(what = "sp")
```

```r
CASES <- as.data.frame(country.shapes$ADMIN)
colnames(CASES) <- c("Country")
rownames(CASES) <- CASES$Country
CASES$Cases <- 0
CASES[H1N1.df[H1N1.df$Update.Time == "5/23/09 8:00","Country"], "Cases"] <-
  H1N1.df[H1N1.df$Update.Time == "5/23/09 8:00","Cases"]
pal <- colorNumeric(
  palette = "Reds",
  domain = country.shapes$CASES
)
country.shapes$CASES <- CASES$Cases
```

```r
leaflet(options=leafletOptions(minZoom=2, maxZoom=18)) %>%
  setView(-96.8, 39, 4) %>%
  addTiles()
```
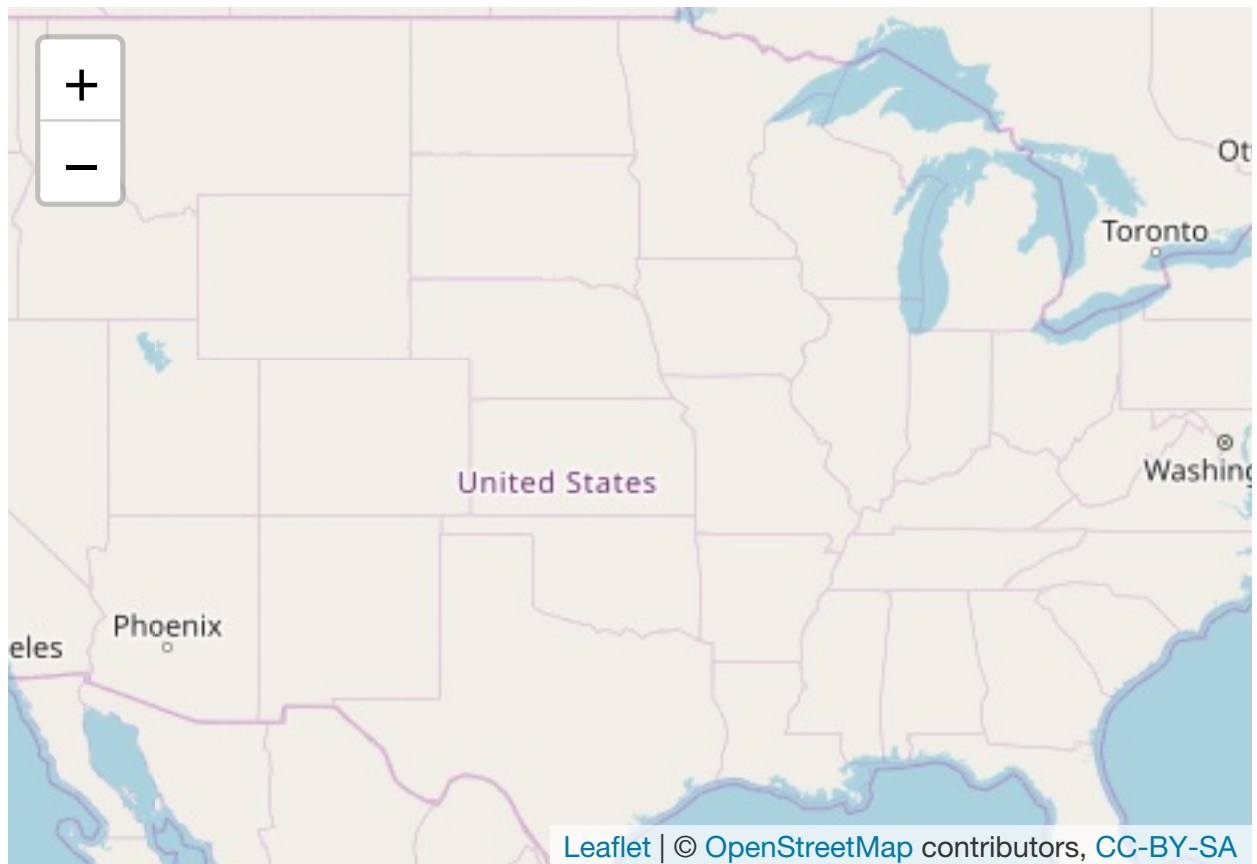
May 23 2009

```r
m <- country.shapes %>%
  leaflet()  %>%
  addPolygons(
    stroke=FALSE,
    smoothFactor = 0.2,
    fillOpacity = 0.7,
    color = ~pal(CASES)
  )%>%
  setView(-96.8, 39, 4)
m
```