Title: "Which type of weather events are most harmful for public health and economy in USA"

Synopsis

Storms and other severe weather events can cause both public health and economic problems for communities and municipalities. Many severe events can result in fatalities, injuries, and property damage, and preventing such outcomes to the extent possible is a key concern.The goal of this study was to find out which type of weather events are most harmful for public health and economy in USA. This study involves exploring the U.S. National Oceanic and Atmospheric Administration's (NOAA) storm database. This database tracks characteristics of major storms and weather events in the United States, including when and where they occur, as well as estimates of any fatalities, injuries, and property damage.The data for the analysis covers the period from 1950 to November 2011. The influence of weather events on public health was done by assessment of the total number of reported victims.The estimation of economic consequences was assessed taking into consideration the amount of losses of property damage and crop damage. The analysis shows that tornado is most harmful for public health as well as property damage, while hail is most harmful for crop damage.

Data processing

Load needed libraries and file

```
library(dplyr)
```

```
##
## 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
```

```
Storm <- read.csv(file = "repdata_data_StormData.csv")
```

Look at data

```
head(Storm)
```

```
##   STATE__           BGN_DATE BGN_TIME TIME_ZONE COUNTY COUNTYNAME STATE  EVTYPE
## 1       1  4/18/1950 0:00:00     0130       CST     97     MOBILE    AL TORNADO
## 2       1  4/18/1950 0:00:00     0145       CST      3    BALDWIN    AL TORNADO
## 3       1  2/20/1951 0:00:00     1600       CST     57    FAYETTE    AL TORNADO
## 4       1   6/8/1951 0:00:00     0900       CST     89    MADISON    AL TORNADO
## 5       1 11/15/1951 0:00:00     1500       CST     43    CULLMAN    AL TORNADO
```

```
## 6       1 11/15/1951 0:00:00     2000       CST     77 LAUDERDALE    AL TORNADO
##   BGN_RANGE BGN_AZI BGN_LOCATI END_DATE END_TIME COUNTY_END COUNTYENDN
## 1         0                                               0         NA
## 2         0                                               0         NA
## 3         0                                               0         NA
## 4         0                                               0         NA
## 5         0                                               0         NA
## 6         0                                               0         NA
##   END_RANGE END_AZI END_LOCATI LENGTH WIDTH F MAG FATALITIES INJURIES PROPDMG
## 1         0                      14.0   100 3   0          0       15    25.0
## 2         0                       2.0   150 2   0          0        0     2.5
## 3         0                       0.1   123 2   0          0        2    25.0
## 4         0                       0.0   100 2   0          0        2     2.5
## 5         0                       0.0   150 2   0          0        2     2.5
## 6         0                       1.5   177 2   0          0        6     2.5
##   PROPDMGEXP CROPDMG CROPDMGEXP WFO STATEOFFIC ZONENAMES LATITUDE LONGITUDE
## 1          K       0                                         3040      8812
## 2          K       0                                         3042      8755
## 3          K       0                                         3340      8742
## 4          K       0                                         3458      8626
## 5          K       0                                         3412      8642
## 6          K       0                                         3450      8748
##   LATITUDE_E LONGITUDE_ REMARKS REFNUM
## 1       3051       8806              1
## 2          0          0              2
## 3          0          0              3
## 4          0          0              4
## 5          0          0              5
## 6          0          0              6
```

Subset necessary data

```
Storm1 <- Storm[, c("EVTYPE", "FATALITIES", "INJURIES", "PROPDMG", "CROPDMG")]
```

Missing values identification

```
sum(is.na(Storm1)) # There are no NA's.
```

```
## [1] 0
```

Results

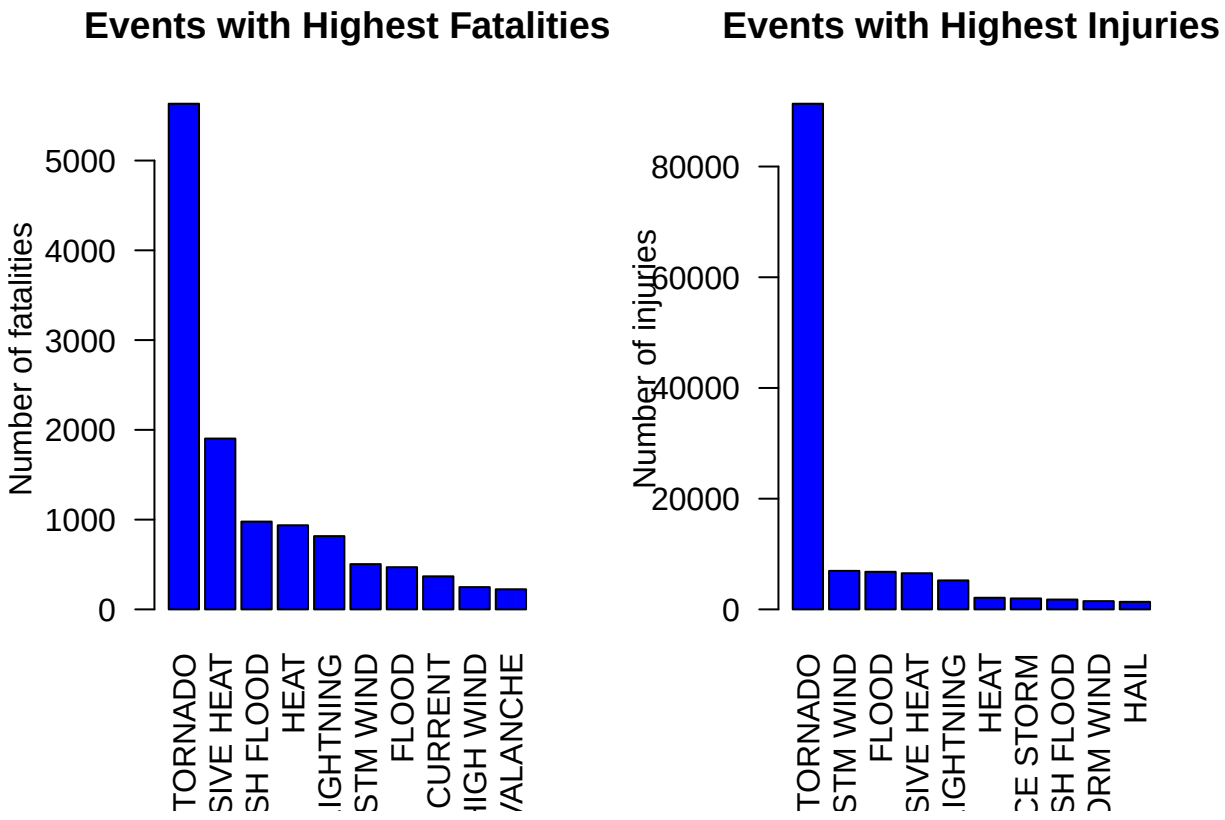
Answering the question *"Which type of event are more harmful for population health?"*

```
fatal <- aggregate(FATALITIES~EVTYPE, Storm1, sum)
injur <- aggregate(INJURIES~EVTYPE, Storm1, sum)

top10_fatal <- arrange(fatal, desc(fatal$FATALITIES))[1:10,]
```

```
top10_injur <- arrange(injur, desc(injur$INJURIES))[1:10,]

par(mfrow = c(1, 2))
barplot(top10_fatal$FATALITIES, las=2, names.arg = top10_fatal$EVTYPE, main = "Events with Highest Fatal
barplot(top10_injur$INJURIES, las=2, names.arg = top10_injur$EVTYPE, main = "Events with Highest Injuri
```



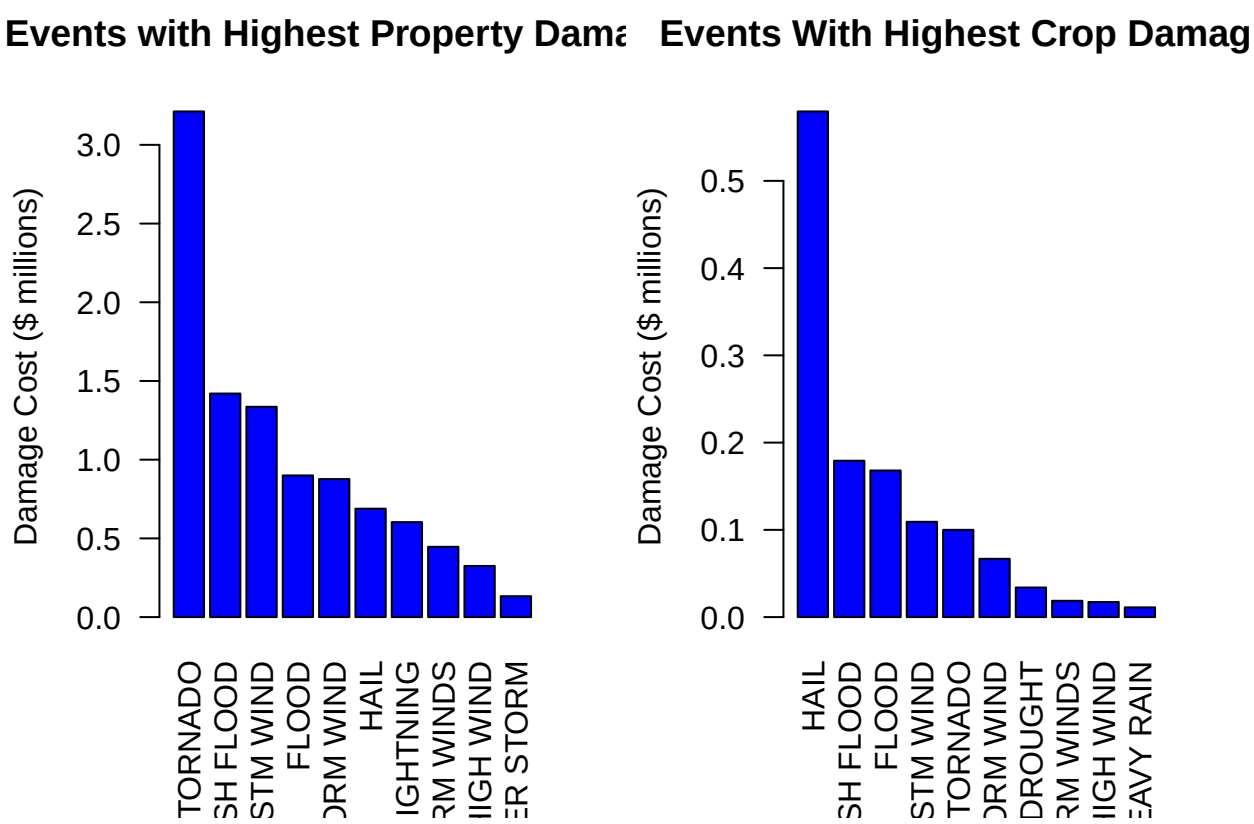
The most harmful for population health is tornado.

Answering the question *"Which types of events have the greatest economic consequences?"*

```
prop <- aggregate(PROPDMG~EVTYPE, Storm1, sum)
crop <- aggregate(CROPDMG~EVTYPE, Storm1, sum)

top10_prop <- arrange(prop, desc(prop$PROPDMG))[1:10,]
top10_crop <- arrange(crop, desc(crop$CROPDMG))[1:10,]

par(mfrow = c(1,2))
barplot(top10_prop$PROPDMG/(10^6), las=2, names.arg = top10_prop$EVTYPE, col="blue", main = "Events wit
barplot(top10_crop$CROPDMG/(10^6), las=2, names.arg = top10_crop$EVTYPE, col="blue", main = "Events Wit
```



The greatest reatest economic consequences has tornado for property damage, while hail is most harmful for crop damage.