Weather Impact on Population Health and Economics in USA

Synopsis

The weather can create a lot of dangerous events with consequences in health and economic areas. This study deals with them in accordance with dataset from the U.S. National Oceanic and Atmospheric Administration's (NOAA) storm database.

Data Processing

1. Reading a Data

   The data have to be in a current directory. Then it is read into variable “rawData”

```
displayResults<-FALSE

rawData<-read.csv("repdata-data-StormData.csv")
if (displayResults){
    View(rawData)
    head(rawData)
    summary(rawData)
}
```

   There is needed only columns “EVTYPE”,“INJURIES”,“FATALITIES”, and “PROPDMG” for our analysis. That is why a new variable “selectedData” is created.

```
selectedData<-
rawData[,c("EVTYPE","INJURIES","FATALITIES","PROPDMG")]

if (displayResults){
    View(selectedData)
}
```

2. Processing a data

   Creating a most harmful weather event - fatal and injuries - and weather events with the greatest economic consequences.

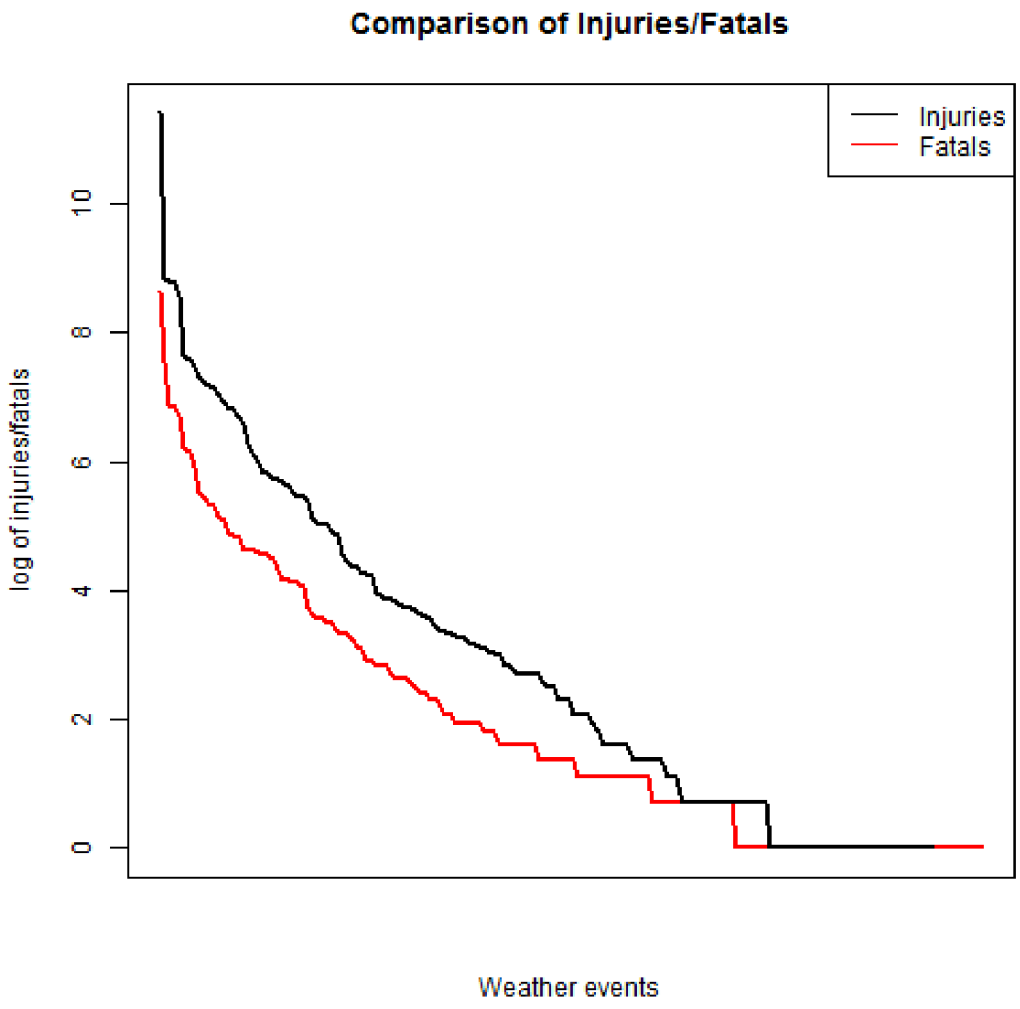
```
    fatal<-aggregate(FATALITIES ~ EVTYPE, data =
selectedData, sum, na.rm = TRUE)
    fatal <- fatal[order(fatal$FATALITIES,decreasing
= TRUE, na.last=TRUE) , ]
    if (displayResults){
        View(fatal)
    }

    injur<-aggregate(INJURIES ~ EVTYPE, data =
selectedData, sum, na.rm = TRUE)
    injur<-injur[order(injur$INJURIES,decreasing =
TRUE, na.last=TRUE), ]
    if (displayResults){
        View(injur)
    }

    econ<-aggregate(PROPDMG ~ EVTYPE, data =
selectedData, sum, na.rm = TRUE)
    econ<-econ[order(econ$PROPDMG,decreasing = TRUE,
na.last=TRUE), ]
    if (displayResults){
        View(econ)
    }
```

Results

1. Most harmful weather events

   Figure 1: Comparison of injuries/fatals.

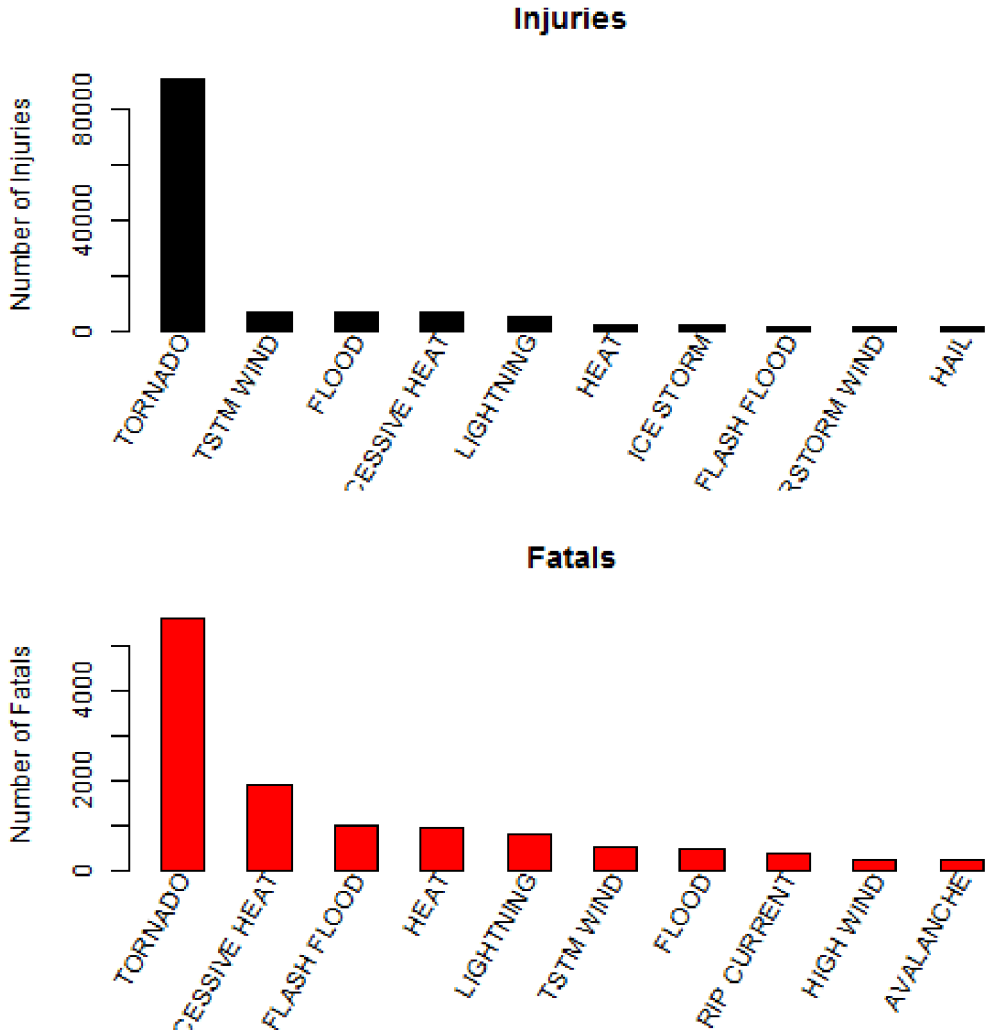
```
    plot(log(fatal[,2]),
        type="l",
        col="red",
        xaxt="n",
        ylim=c(0,max(log(injur[,2]))),
        xlim=c(1,sum(fatal[,2]>0)),
        xlab="Weather events",
        ylab="log of injuries/fatals",
        main="Comparison of Injuries/Fatals",
        lwd=2)
    lines(log(injur[,2]),col="black",lwd=2)
    legend("topright",
        legend=c("Injuries","Fatals"),
        col=c(rgb(0,0,0),"red"),
        lty=c(1,1,1),
        cex=1, pt.cex = 2)
```



First of all, the Figure 1 compare the number of injuries/fatals in decreasing order.

Figure 2: Detailed wiev on injuries/fatals - top 10.

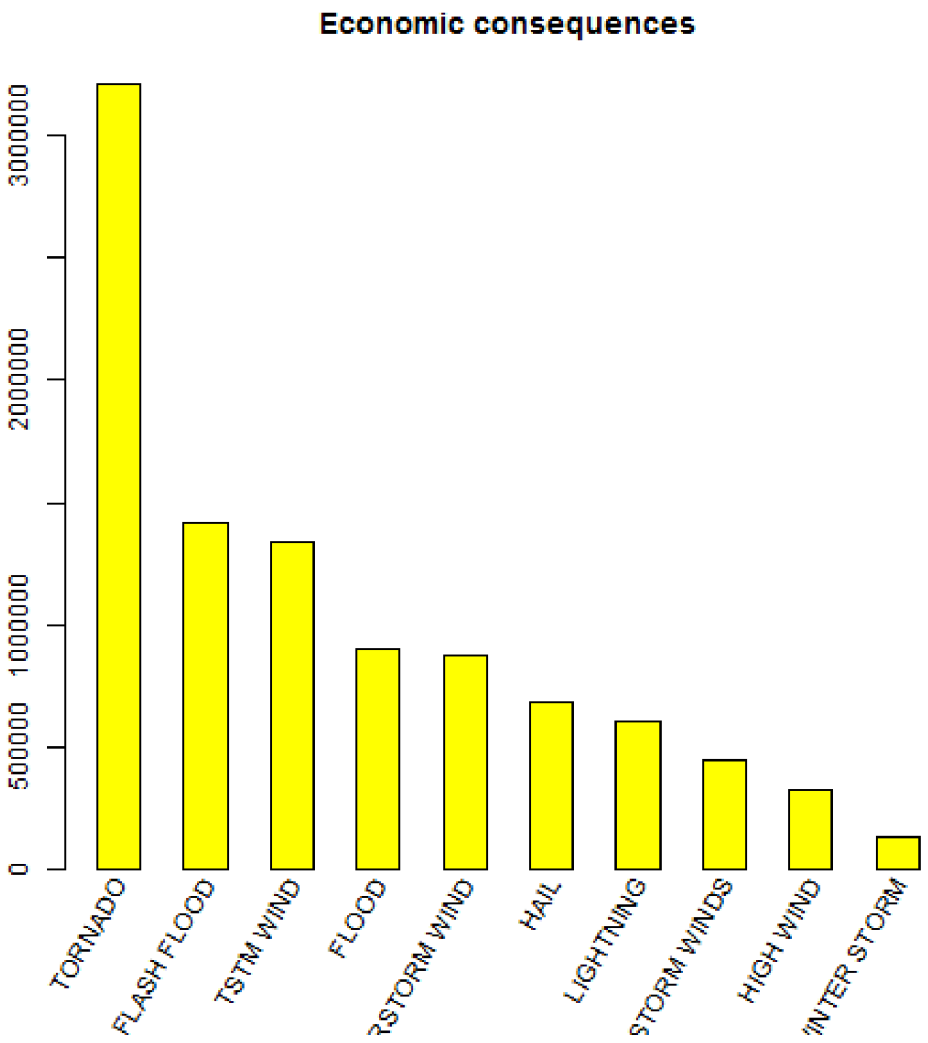
```
    par(mfrow=c(2,1))

    barplot(injur[1:10,2],
        names=injur[1:10,1],
        main="Injuries",
        xlab="",
        ylab="Number of Injuries",
        col="black",
        xaxt="n",
        space=1)
    text(seq(1.5,19.5,by=2),
        par("usr")[3]-0.25,
        srt = 60,
        adj= 1,
        xpd = TRUE,
        labels = injur[1:10,1],
        cex=1)

    barplot(fatal[1:10,2],
        names=fatal[1:10,1],
        main="Fatals",
        xlab="",
        ylab="Number of Fatals",
        col="red",
        xaxt="n",
        space=1)
    text(seq(1.5,19.5,by=2),
        par("usr")[3]-0.25,
        srt = 60,
        adj= 1,
        xpd = TRUE,
        labels = fatal[1:10,1],
        cex=1)
```



There is a detailed wiev in Figure 2 with ten most impactful weather events. It can be easily seen that the most heatlh-impac weather event is tornado.

2. Events with the greatest economic consequences

```
par(mfrow=c(1,1))
barplot(econ[1:10,2],
    names=econ[1:10,1],
    main="Economic consequences",
    xlab="",
    ylab="",
    col="yellow",
    xaxt="n",
    space=1)
text(seq(1.5,19.5,by=2),
    par("usr")[3]-0.25,
    srt = 60,
    adj= 1,
    xpd = TRUE,
    labels = econ[1:10,1],
    cex=1)
```



Similar situation is in the field of economic consequences.