

Storm Report

lsantric

September 27, 2015

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.

This project 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 basic goal of this assignment is to explore the NOAA Storm Database and answer some basic questions about severe weather events.

Data analysis will try to address the following questions:

Across the United States, which types of events (as indicated in the EVTYPE variable) are most harmful with respect to population health?

Across the United States, which types of events have the greatest economic consequences?

Data Processing

After loading the data from csv file, it is grouped by their type and its impact to population health and property aggregated:

```
library(data.table)
library(ggplot2)

stormData <- fread("repdata-data-StormData.csv")
stormData <- data.table(stormData)
setkey(stormData, EVTYPE)

fatal <- stormData[,sum(FATALITIES), by=EVTYPE]
setkey(fatal, V1)
setorder(fatal,-V1)
setnames(fatal, c("Type", "Fatalities"))

injury <- stormData[,sum(INJURIES), by=EVTYPE]
setkey(injury, V1)
setorder(injury,-V1)
setnames(injury, c("Type", "Injuries"))

setkey(stormData, PROPDMGEXP)
stormData["K", PROPDMGEXP := "3"]
setkey(stormData, PROPDMGEXP)
stormData["M", PROPDMGEXP := "6"]
setkey(stormData, PROPDMGEXP)
stormData["B", PROPDMGEXP := "9"]
damage <- stormData[,absDMG := PROPDMG * 10 ^ as.numeric(PROPDMGEXP)]
```

```
damage <- damage[,sum(absDMG, na.rm = TRUE), by=EVTTYPE]
setkey(damage, V1)
setorder(damage,-V1)
setnames(damage, c("Type", "Damage"))
```

Results

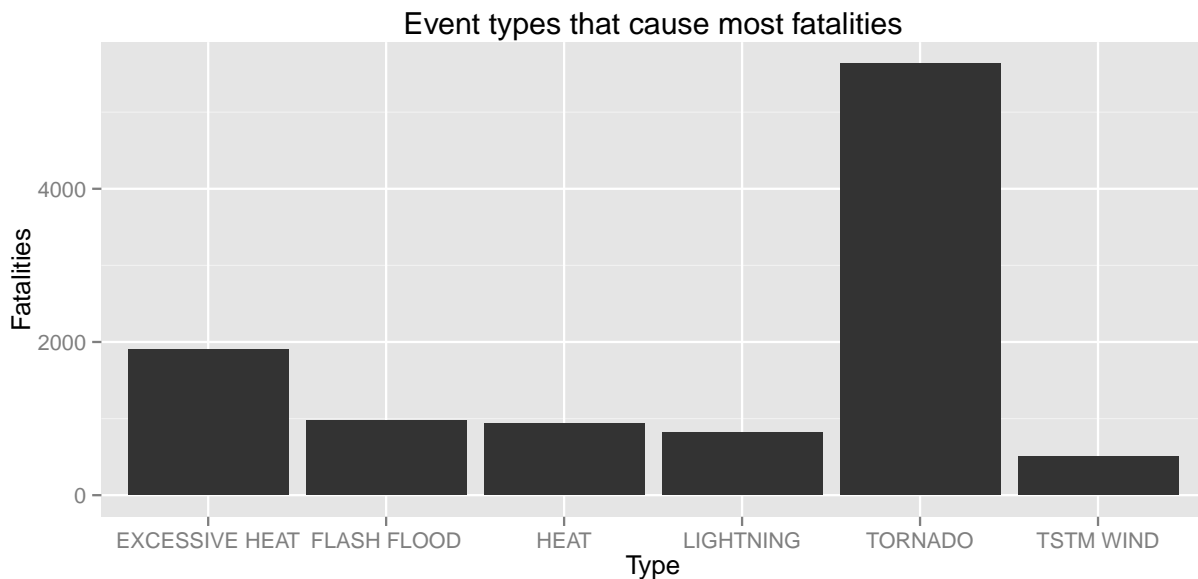
Impact on population health

The following r code plots number of injuries and fatalities by event type:

```
head(fatal)
```

```
##           Type Fatalities
## 1:    TORNADO      5633
## 2: EXCESSIVE HEAT     1903
## 3:  FLASH FLOOD      978
## 4:        HEAT       937
## 5:    LIGHTNING      816
## 6:    TSTM WIND      504
```

```
ggplot(data.table(head(fatal)), aes(x=Type, y=Fatalities)) +
  geom_bar(stat="identity") +
  ggtitle("Event types that cause most fatalities")
```

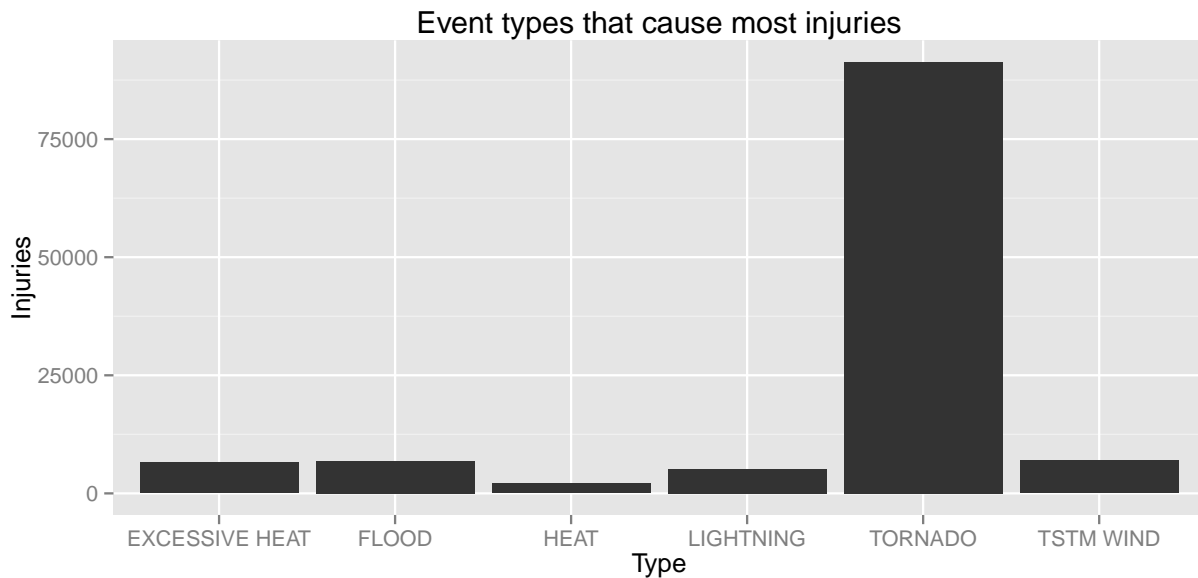


```
head(injury)
```

```
##           Type Injuries
## 1:    TORNADO    91346
## 2:    TSTM WIND   6957
## 3:     FLOOD     6789
```

```
## 4: EXCESSIVE HEAT      6525
## 5:      LIGHTNING      5230
## 6:      HEAT          2100
```

```
ggplot(data.table(head(injury)), aes(x=Type, y=Injuries)) +
  geom_bar(stat="identity") +
  ggtitle("Event types that cause most injuries")
```



It is clear from the data that tornadoes present greatest threat to the population by far.

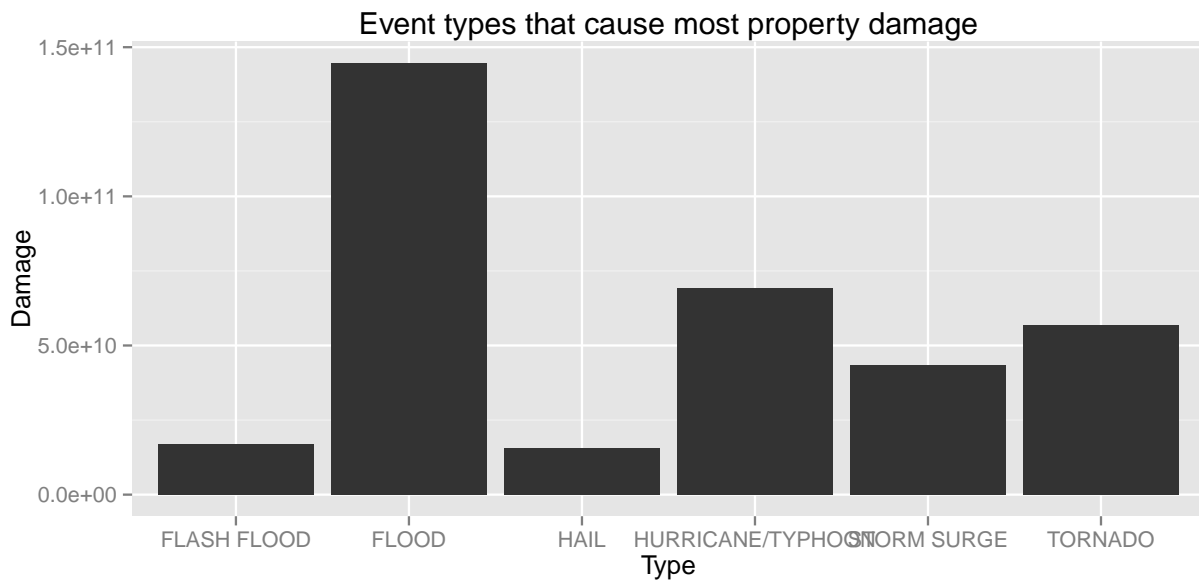
Impact on property

The following r code plots property damage in dollars by event type:

```
head(damage)
```

```
##           Type      Damage
## 1:      FLOOD 144657709800
## 2: HURRICANE/TYPHOON 69305840000
## 3:      TORNADO 56935880614
## 4:    STORM SURGE 43323536000
## 5:    FLASH FLOOD 16822673772
## 6:      HAIL 15730366956
```

```
ggplot(data.table(head(damage)), aes(x=Type, y=Damage)) +
  geom_bar(stat="identity") +
  ggtitle("Event types that cause most property damage")
```



Weather events that make most damage to property are floods, hurricanes, tornadoes and storm surges. Floods are responsible the most.