Global Terrorism Data Analysis

Matthew Terribile

August 2017

Objective

Analyze the Global Terrorism Database (http://start.umd.edu/gtd/) which includes data on terrorist attacks between 1970 and 2016, excluding 1993.
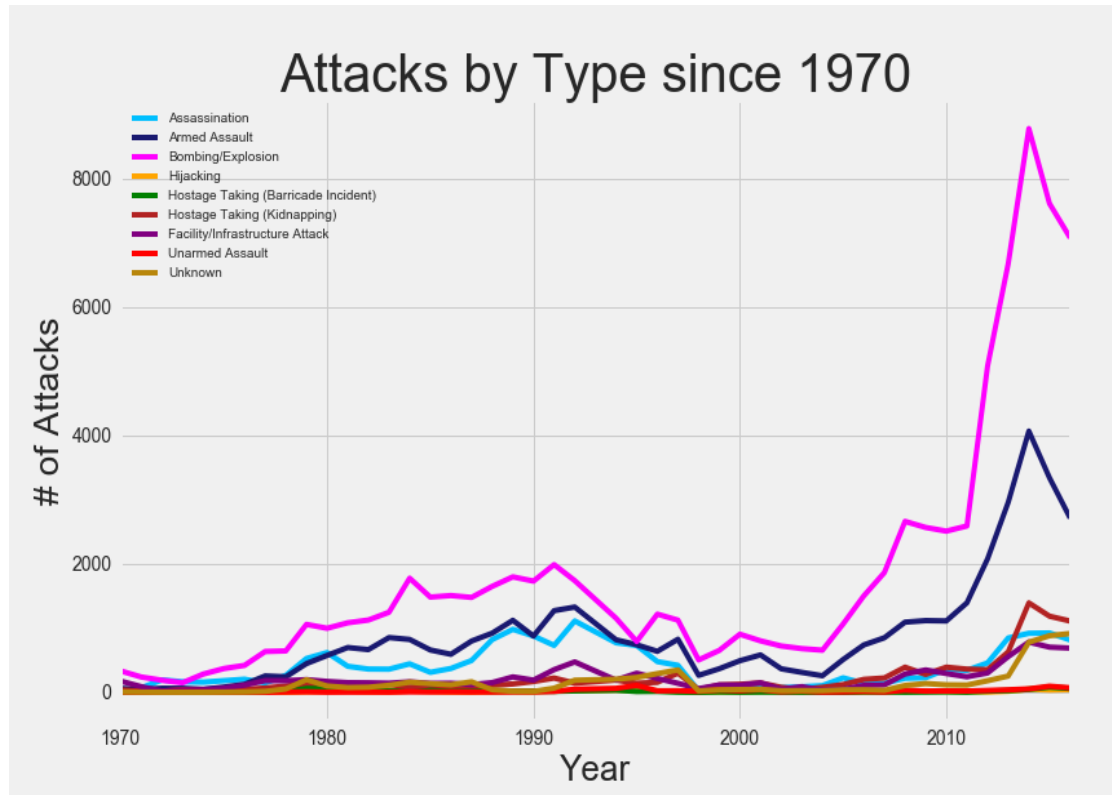

- Perform exploratory data analysis
- Examine differences in frequency of attacks using Bayesian techniques
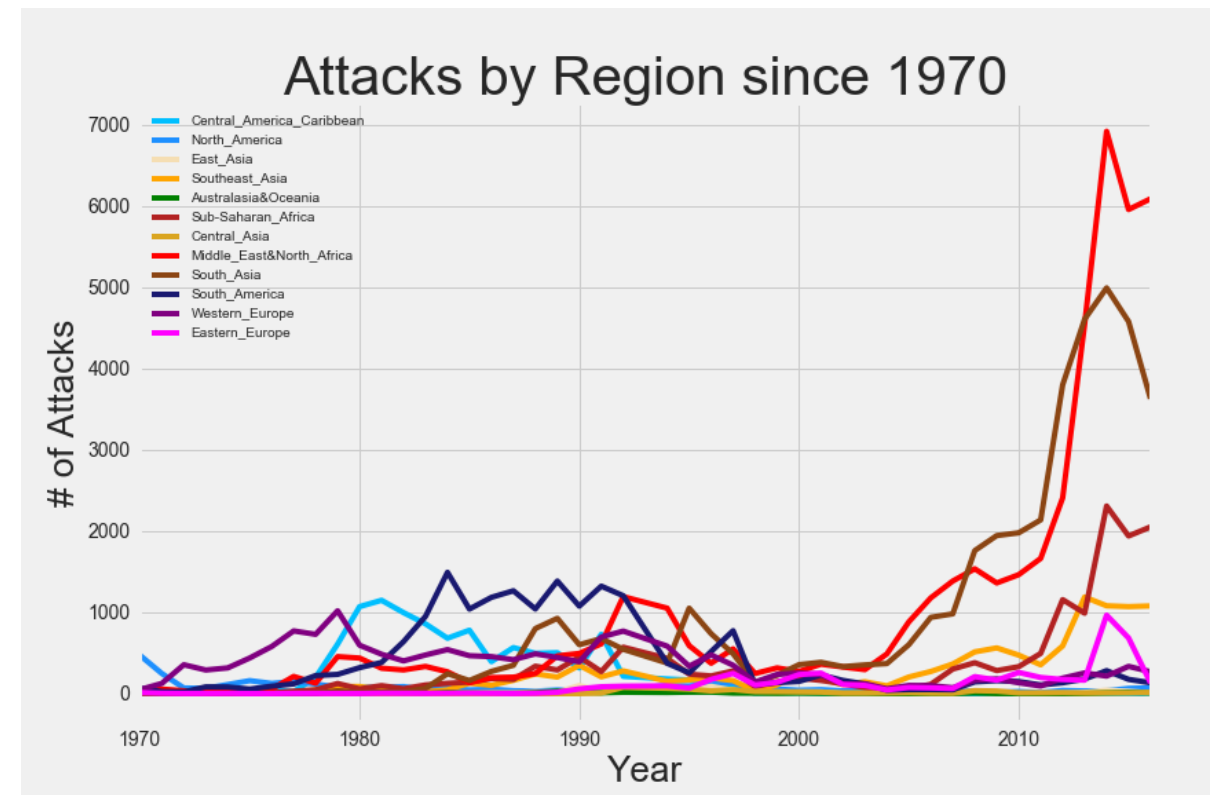- Impute missing 1993 values

Agenda

- Exploratory Data Analysis – spatiotemporal aspects of data

- Impact of 1996 Guatemala Peace Accord on # of Attacks

- Procedure for Imputing Missing 1993 data

- Conclusions

Exploratory Data Analysis
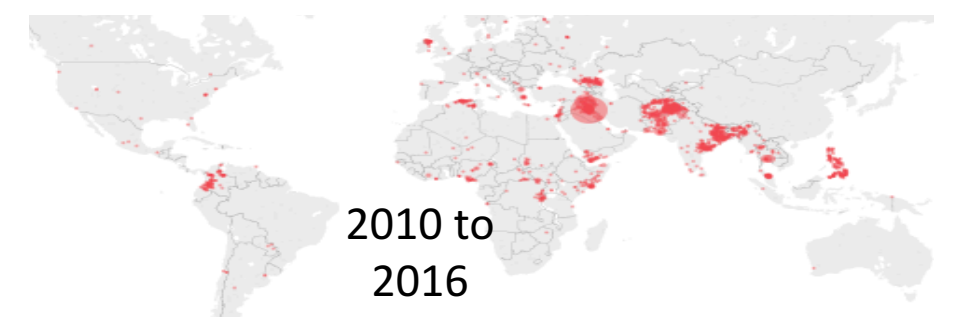
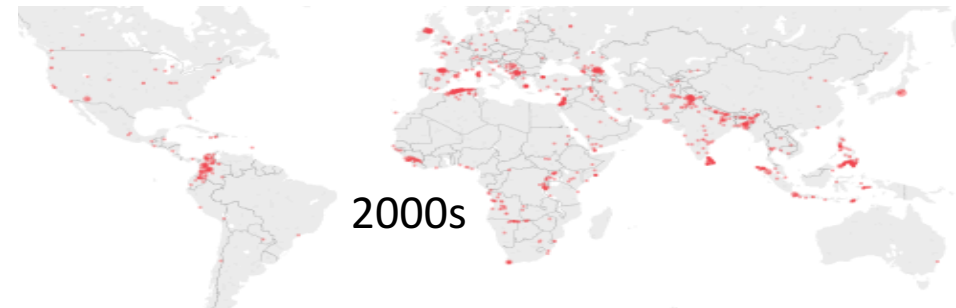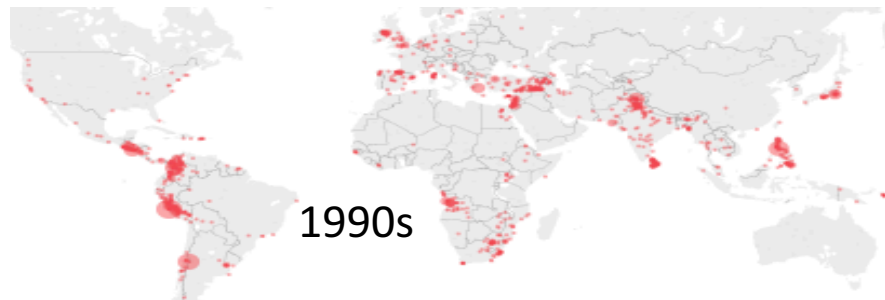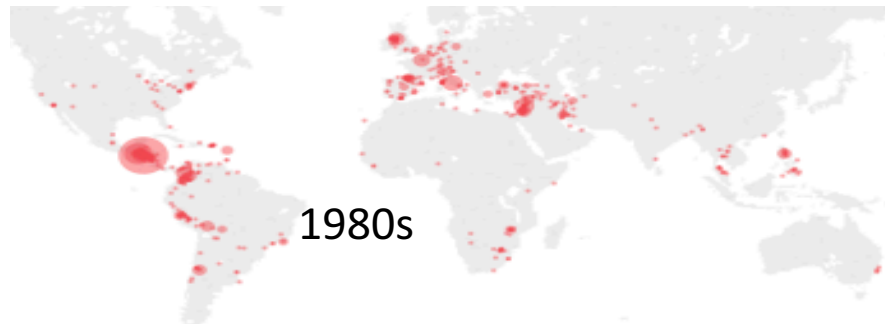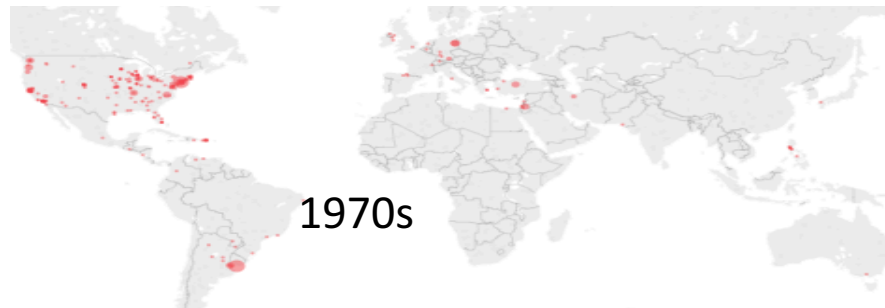## 1. Number of attacks are changing over time

Different types of attacks show similar trends over time

Trends by region vary over time

Exploratory Data Analysis
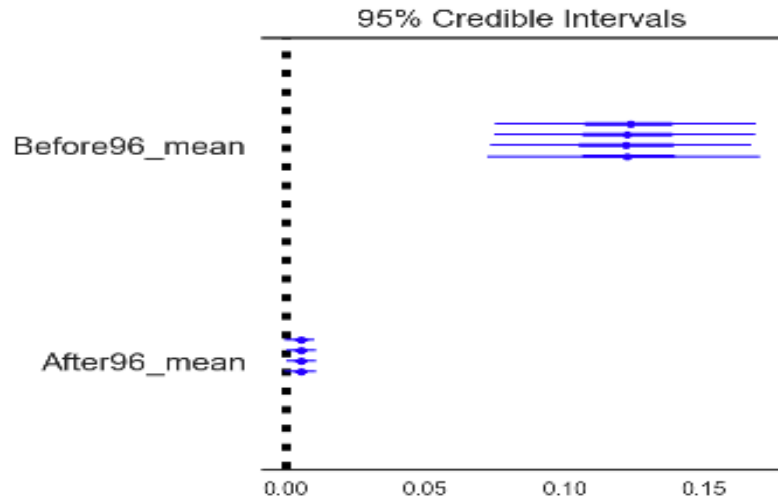
2. Location of attacks by decade

1970s

2000s

1980s

2010 to 2016

1990s

Location of attacks are moving by time

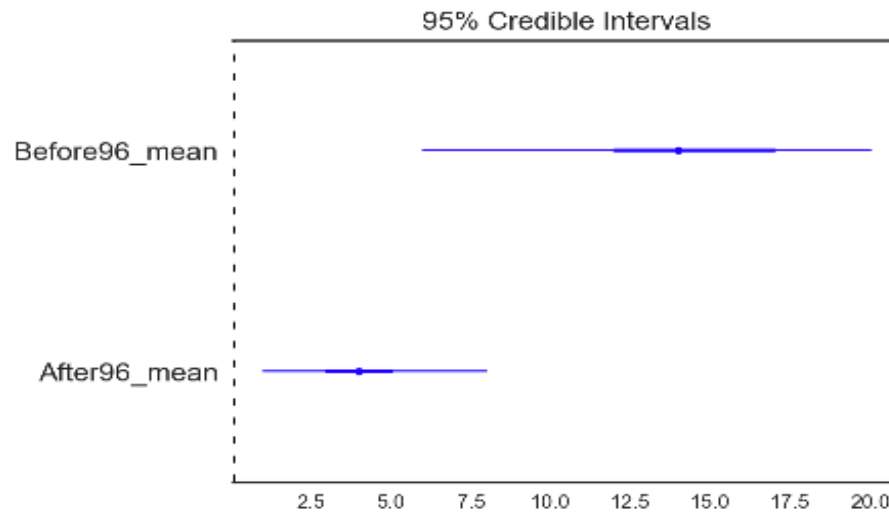# Impact of 1996 Guatemala Peace Accord

Two Bayesian tests:

Ratio of attacks in Central America vs. world before accords vs. after

# of attacks in Guatemala for 10 years before and after

Analysis:

- Clear difference in % of attacks in Central America for 17 years before accord vs. 18 years after

- Difference in # of attacks, but less clear, in Guatemala for 10 years before vs. after

Imputing 1993 Bombings

Investigated time series properties:

Total Attacks Partial Autocorrelation
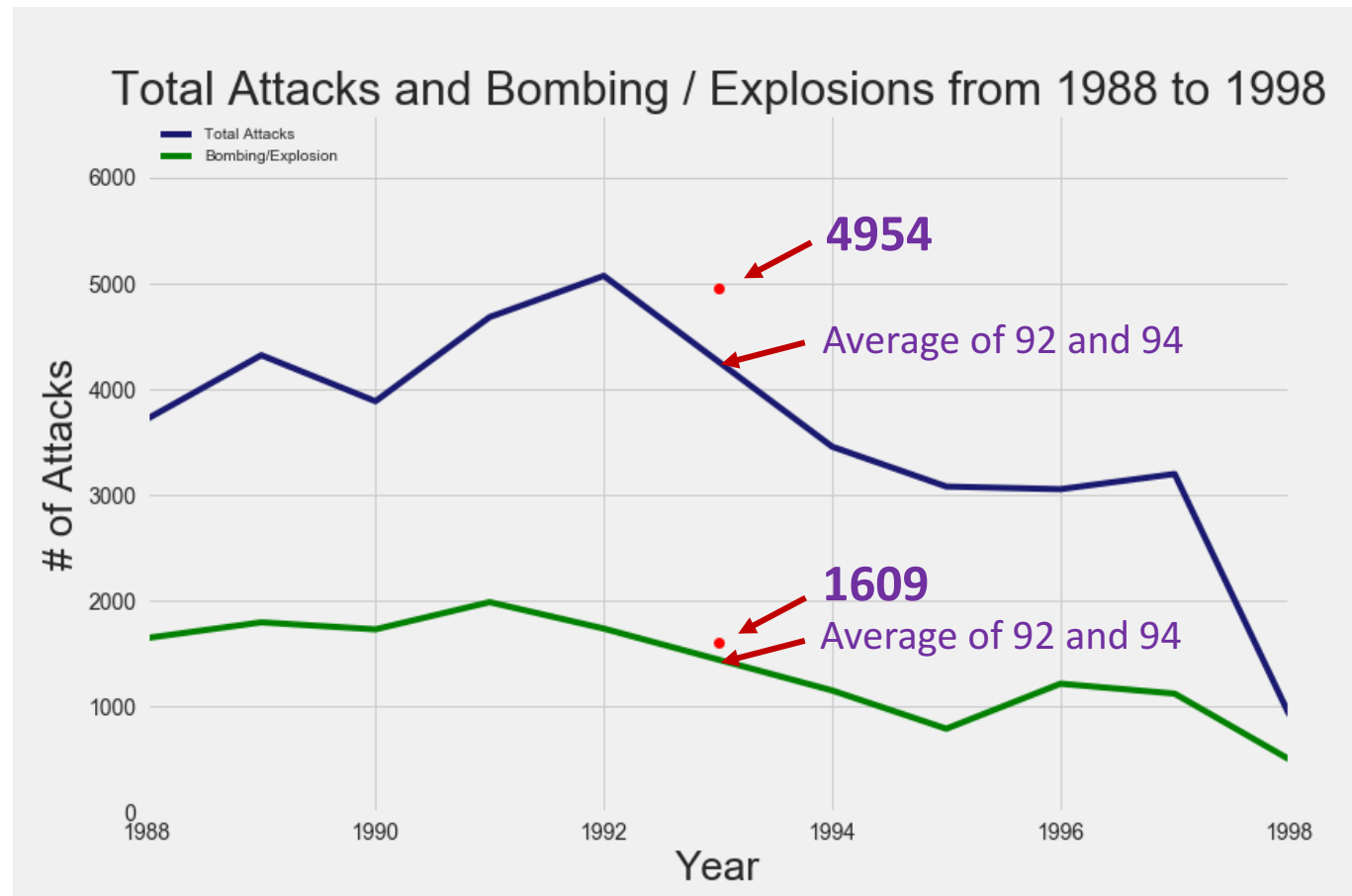

Bombings Partial Autocorrelation
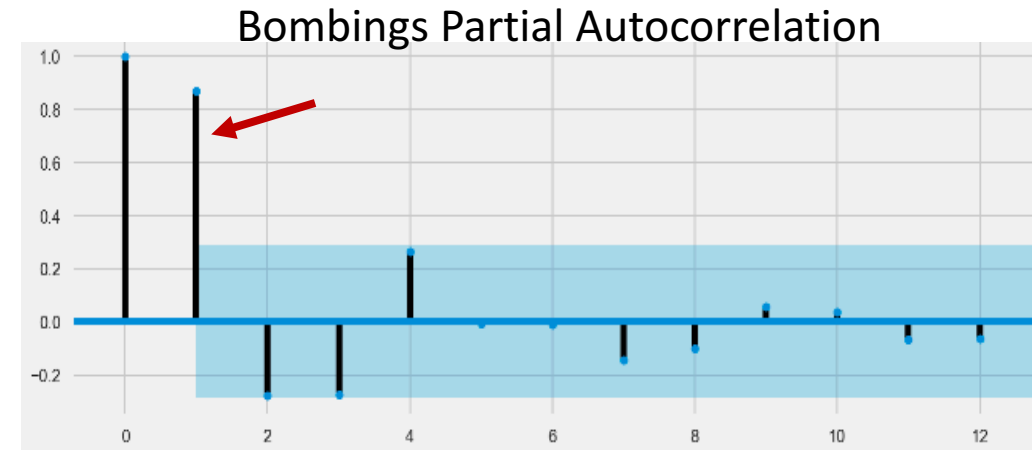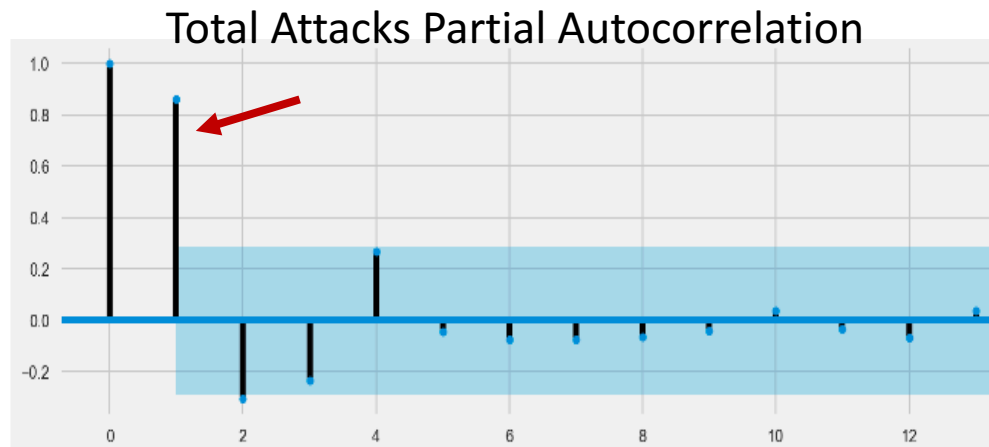
Analysis:

- Most dependence is on previous year's value

- Indicates that averaging adjacent years is a good method

Imputing 1993 Bombings (continued)

Further analysis:

- Codebook appendix indicates that there were **4954** attacks in 1993

- This is 92.6% of 1992 attacks

- Estimate 1993 bombings as 92.6% of 1992 bombings = **1609**

- This seems reasonable since bombings are about 1/3 of total attacks and show similar trends over time as total attacks

Total Attacks and Bombing / Explosions from 1988 to 1998

- Total Attacks
- Bombing/Explosion

4954
Average of 92 and 94

1609
Average of 92 and 94

# of Attacks

Year

Conclusions

- Global Terrorism varies by both time and location

- Significant events, like peace accords in Guatemala, appear to lesson terrorism in that area

- The amount of terrorism over time can most closely be modeled by an AR=1 autoregressive model, i.e.- the previous year's value is most useful for predicting the current year's value.