

Capstone Project

Global Terrorism Analysis

Team

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Problem Statement

The Global Terrorism Database (GTD) is an open-source database including information on terrorist attacks around the world from 1970 through 2017. The GTD includes systematic data on domestic as well as international terrorist incidents that have occurred during this time period and now includes more than 180,000 attacks. The database is maintained by researchers at the National Consortium for the Study of Terrorism and Responses to Terrorism (START), headquartered at the University of Maryland.

Explore and analyze the data to discover key findings pertaining to terrorist activities.

Content

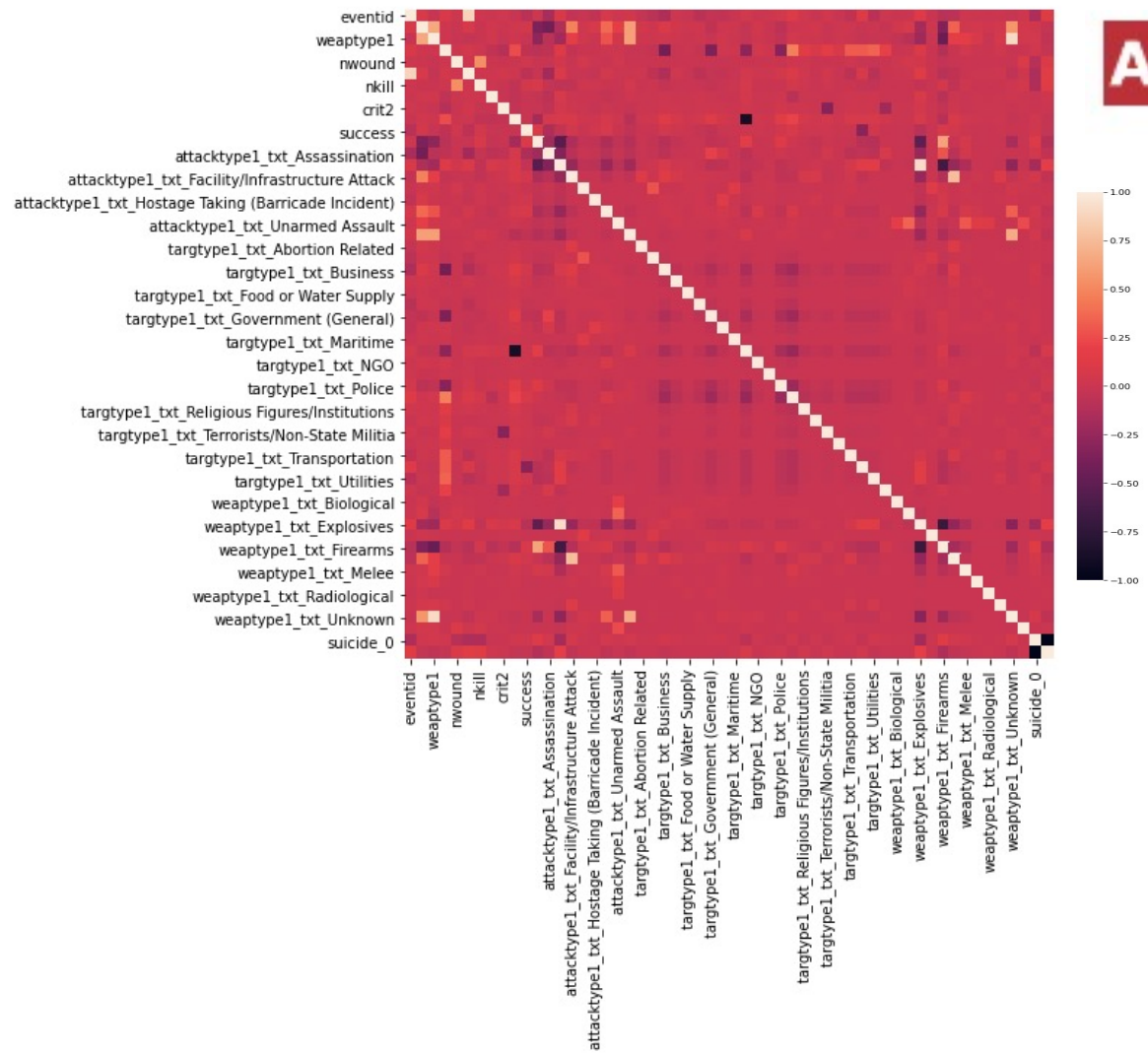
- ❑ Data Summary
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Data Summary

1. attacktype1: Type of the Terror Attack Perpetrated (Categorical)
2. weaptype1: Type of Weapon used to Perpetrate the Terror Attack (Categorical)
3. targtype1: Background of the victim intended to be attacked by perpetrator (Categorical)
4. region_txt: Region the Attack took place in (Categorical)
5. country_txt: Country the Attack took place in (Categorical)
6. city: City the Attack took place in (Categorical)
7. gname: Name of the organisation/group that perpetrated the attack (Categorical)
8. nkill: Number of Fatalities lost after the attack (Numeric)
9. nwound: Number of wounded victims left behind after the attack (Numeric)
10. eventid: Unique ID of each terror attack
11. iyear: The year the terror attack was recorded to have taken place (Categorical)

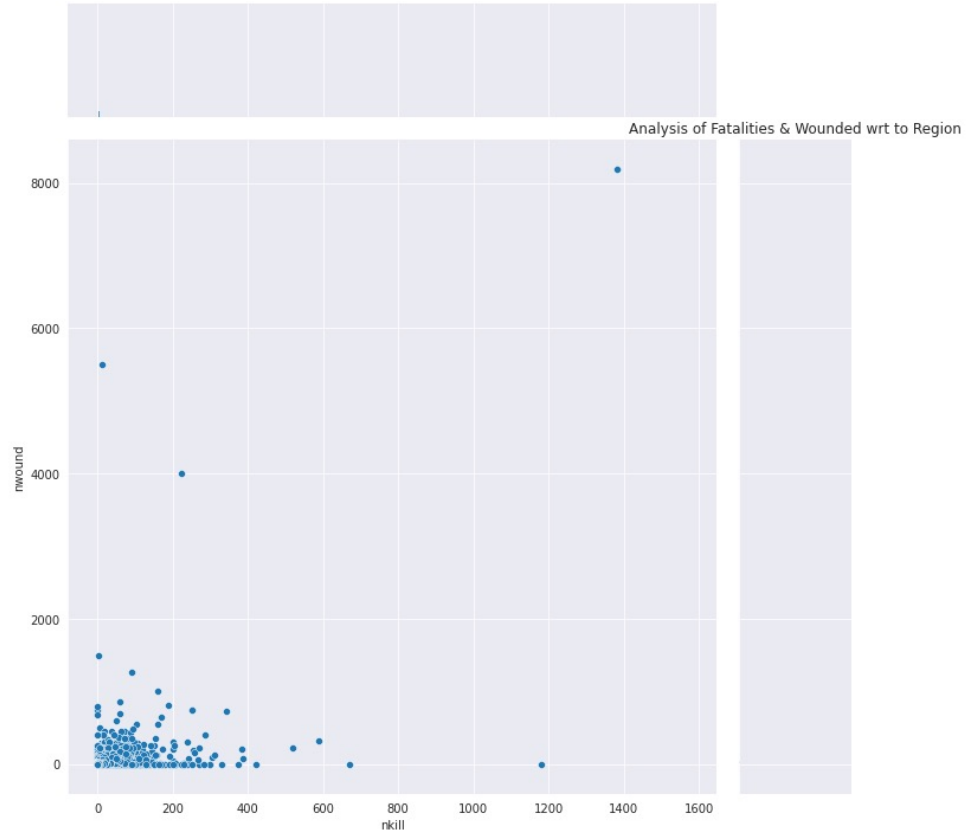
Correlation

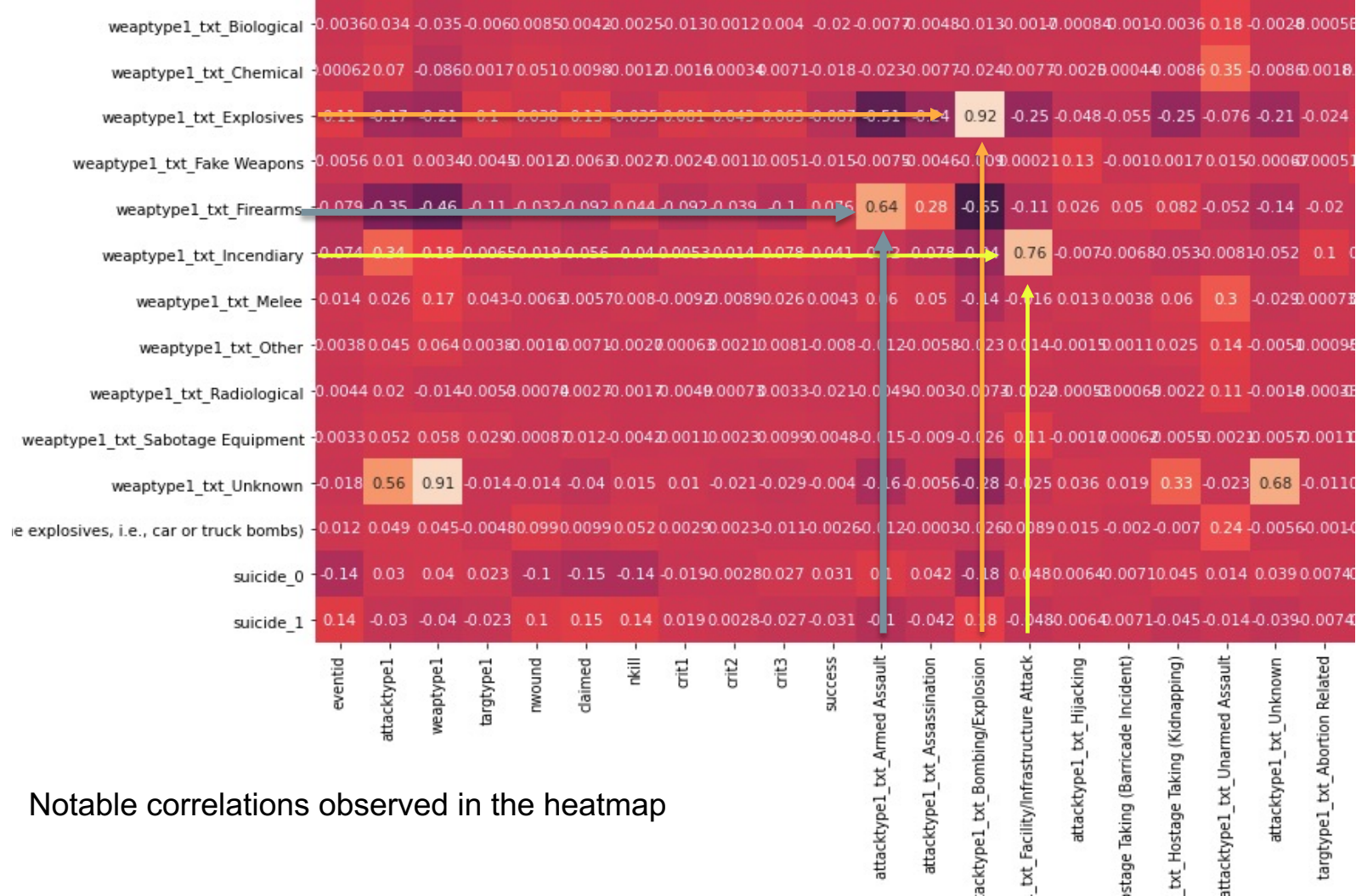
- The Pearson's correlation function couldn't be applied directly because of the presence of categorical variables
- This obstacle is overcome by one-hot encoding the categorical columns.
- We observe positive correlation between weapons and types of attacks
- We observed mild correlation between numerical columns Wounded and Fatalities.



Joint Plot of Numerical Categories Fatalities and Wounded

- The distribution of number of fatalities and number of wounded victims for all attacks is displayed in the plot
- In this we can gather that most of the attacks have less than 200 fatalities and 1000 wounded victims





Notable correlations observed in the heatmap

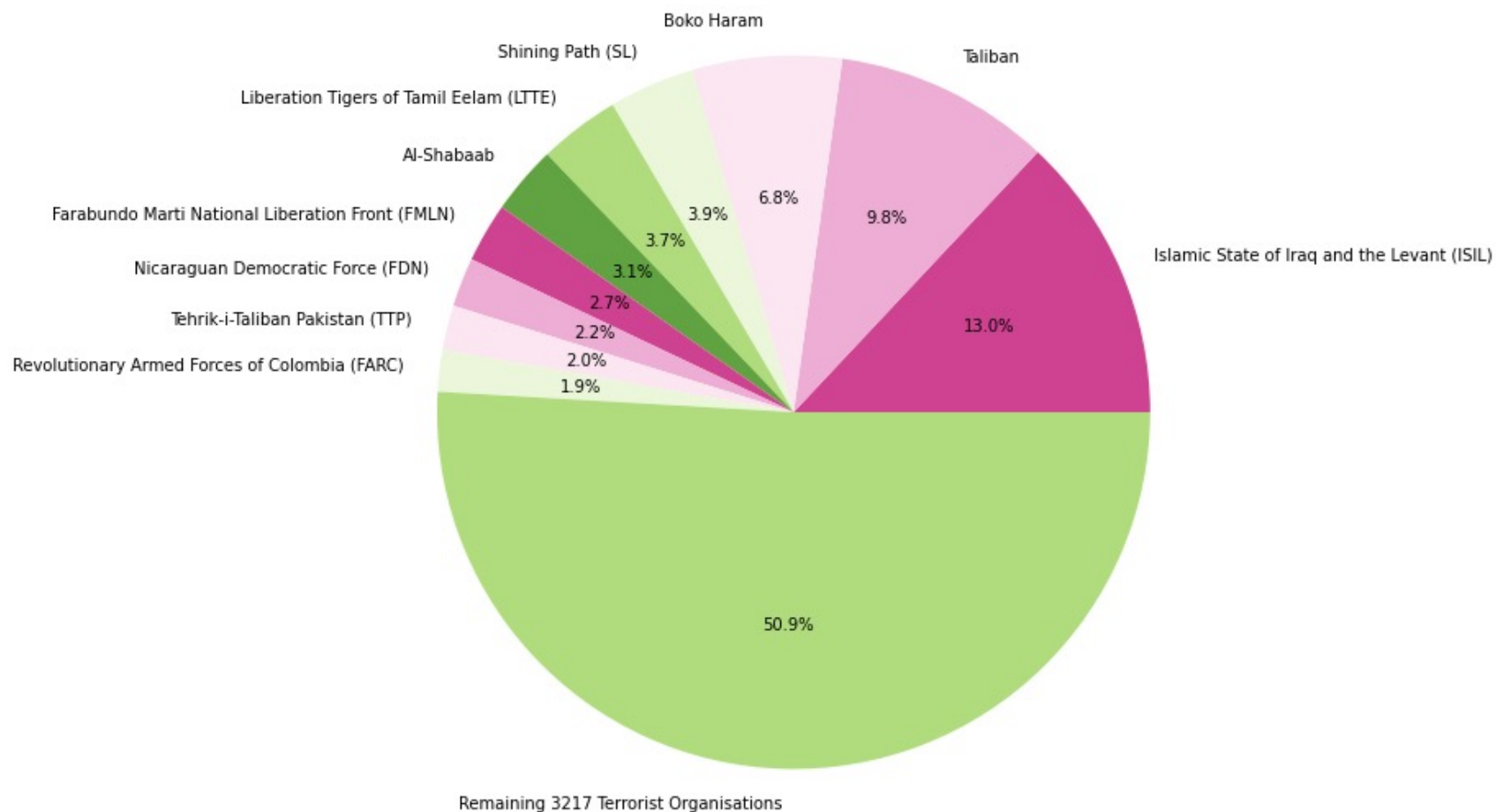
1. Analysis of Terror Attacks by Organisation

- The Pareto Principle, named after esteemed economist Vilfredo Pareto, specifies that 80% of consequences come from 20% of the causes.
- This principle serves as a general reminder that the relationship between inputs and outputs is not balanced.
- Findings: Top 20% of the Terrorist Organisations have contributed to almost 99% of the crimes.
- In this section, we explore the fatalities, attacks and activities to get more insights about Terrorist Groups.

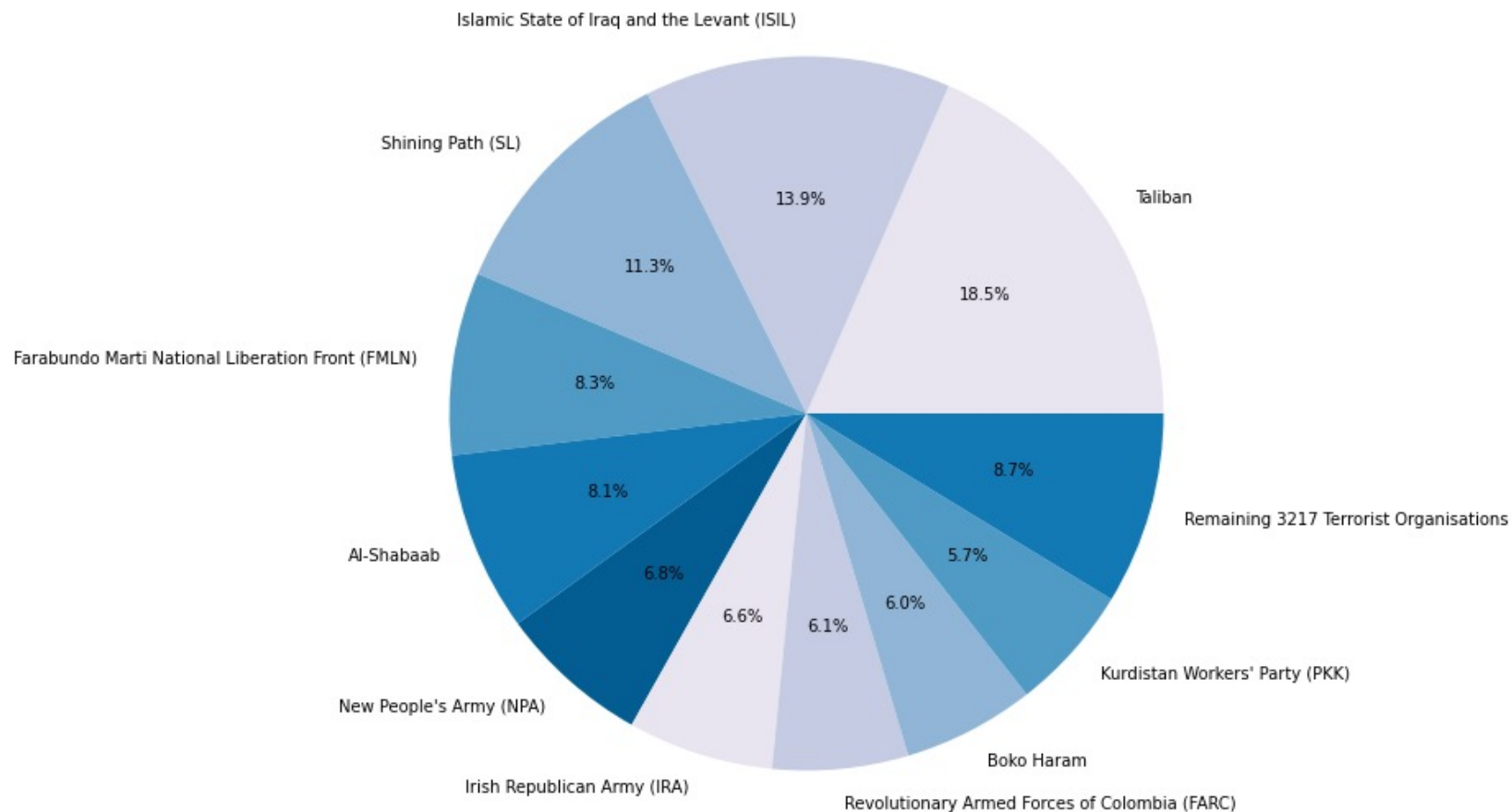
Most Notorious Terrorist Organisations

- The most notorious terrorist organisations are
 - Islamic State of Iraq and the Levant (ISIL)
 - Taliban
 - Boko Haram
 - Shining Path(SL)
- These organisations alone have contributed to more than one third of the total fatalities and almost 50% of the total terror attacks in the world.

Top 10 Terrorist Organisations with highest Fatalities



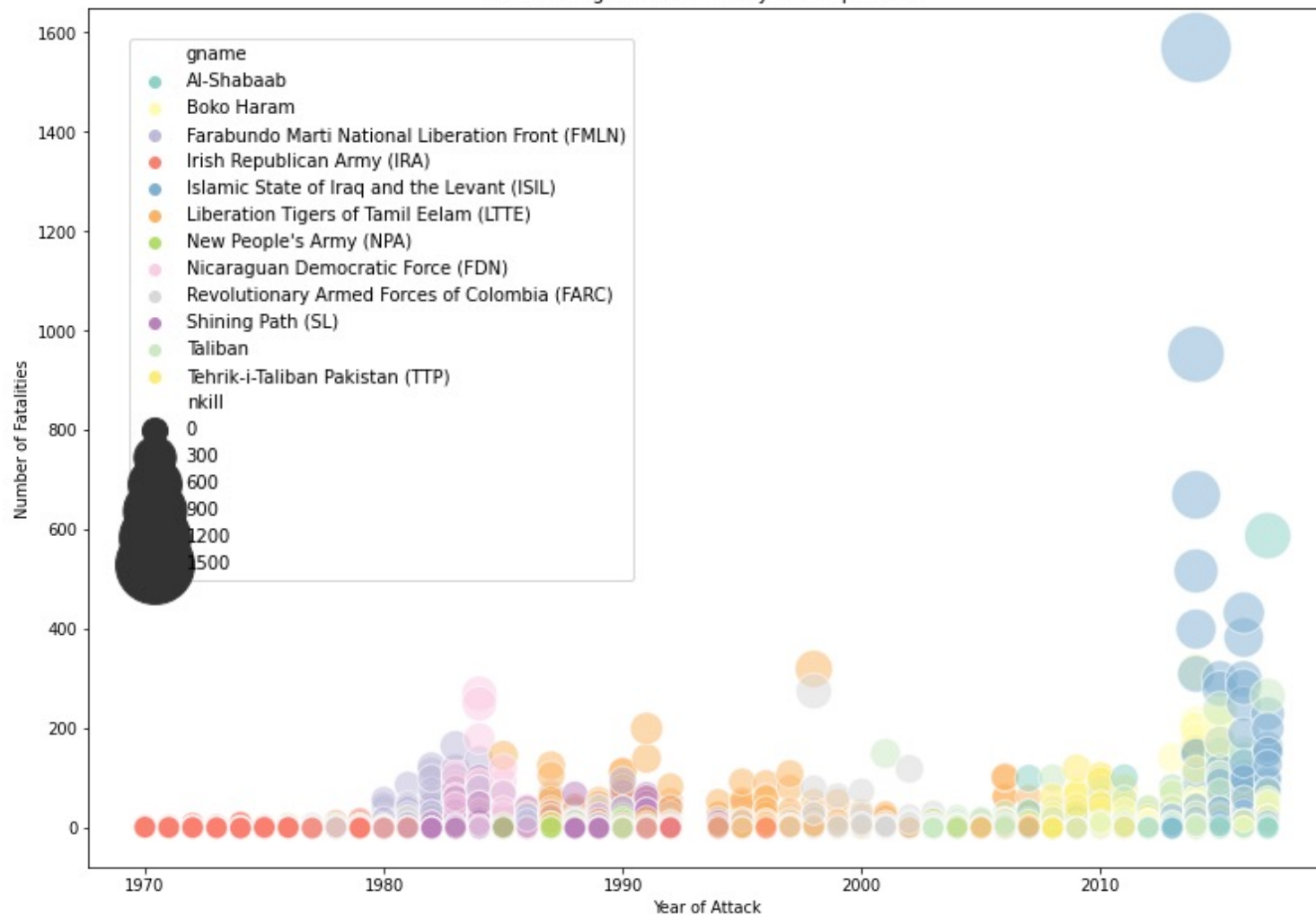
Top 10 Terrorist Organisations with Large Attack Numbers



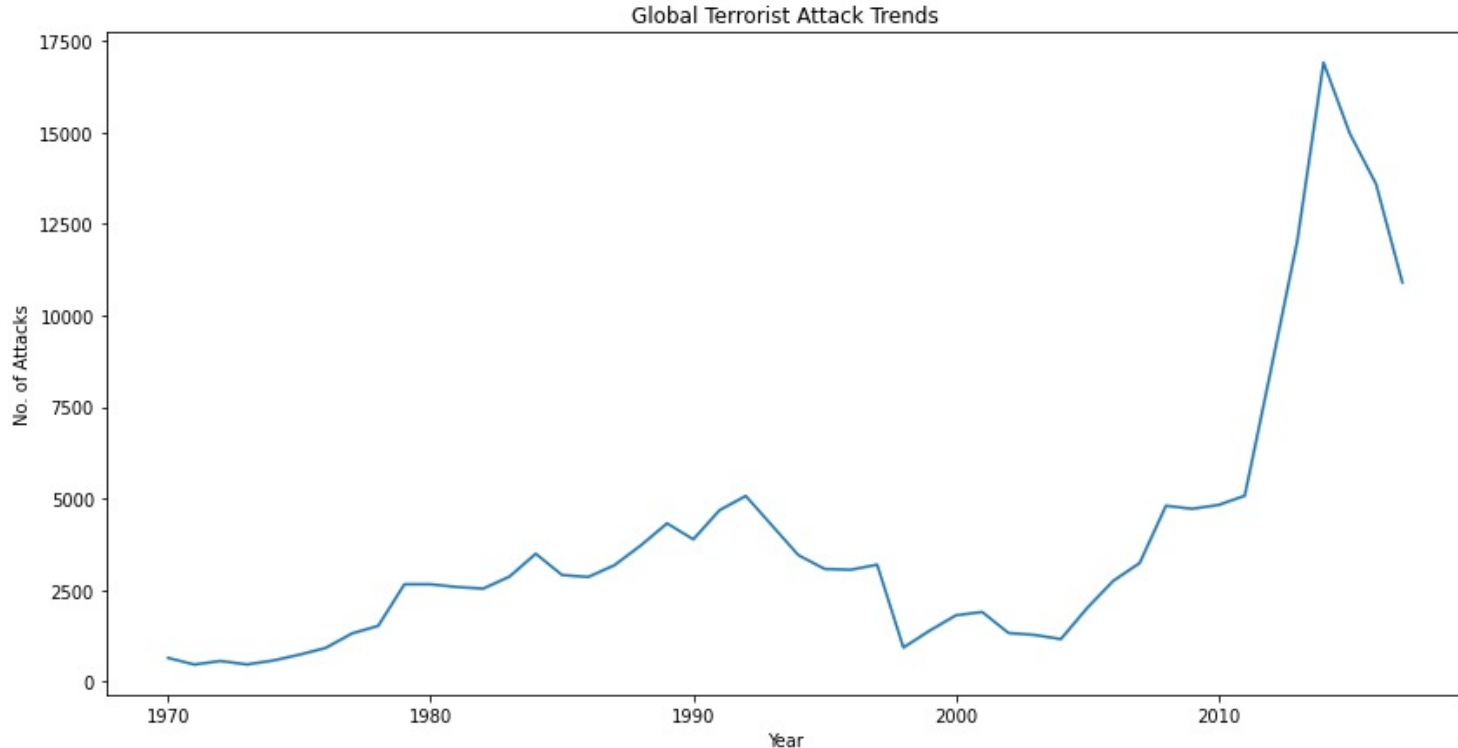
Analyzing Terrorist Organizations by Activity

- Islamic State of Iraq and the Levant (ISIL) (Blue Spots) and Taliban (Dark Green Spots) are active from the mid 2010's and Boko Haram (Lemon Yellow Spots) are active from 2010.
- Liberation Tigers of Tamil Eelam (LTTE) (Orange Spots) are active from late 1980's. Their attacks peaked in mid 1990's and reduced in 2000's.
- The Irish Republican Army (IRA) (Red Spots) have made their attacks constantly from 1970's to 1980's.

Terrorist Organisation Activity and Impact Plot

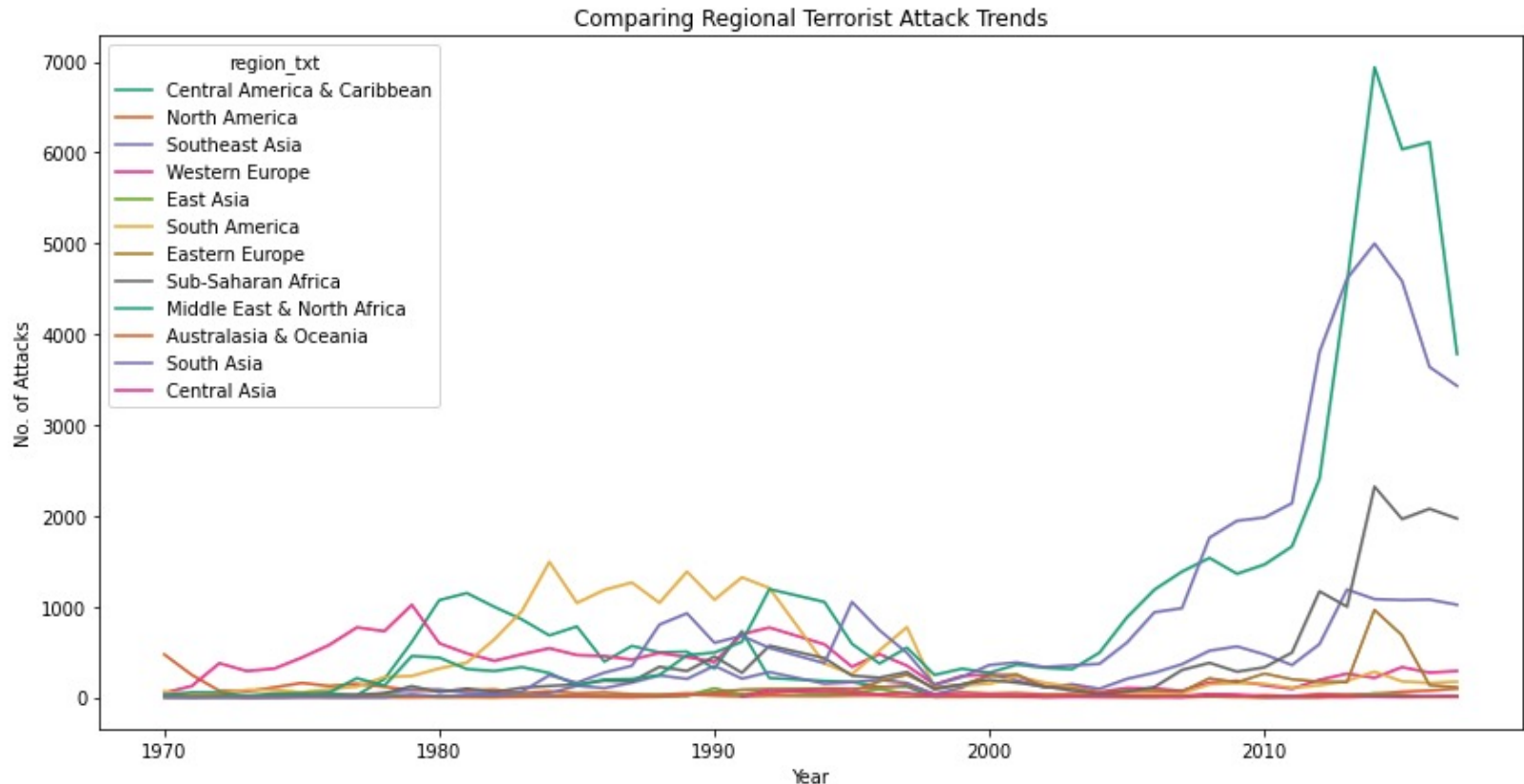


2. Global Terror Attack Trends

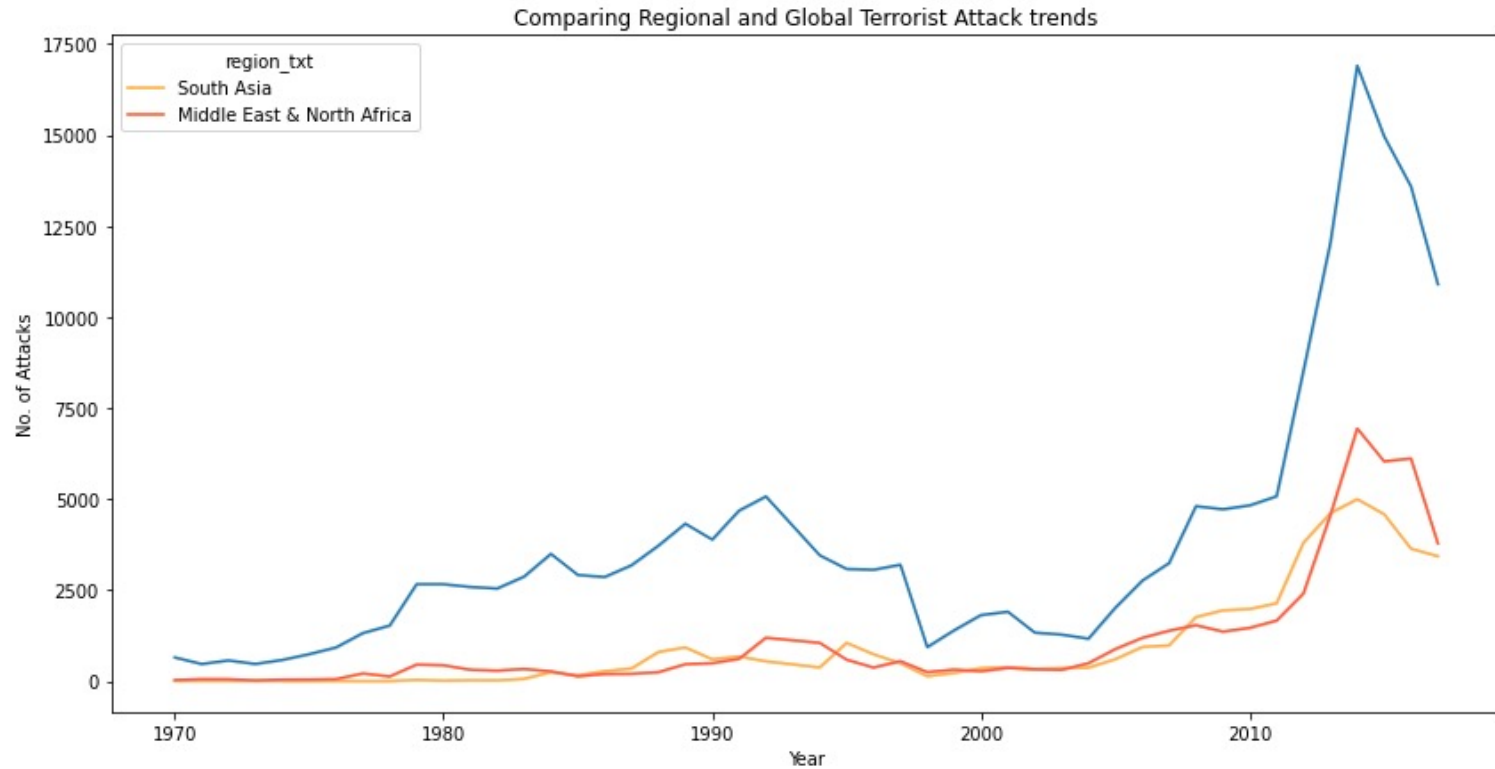


- Global Terrorism started increasing to an all time high from 2011. This peaked in the year 2014 and started dipping ever since

Regional Trends of Terror Attacks per year



Taking a Closer Look

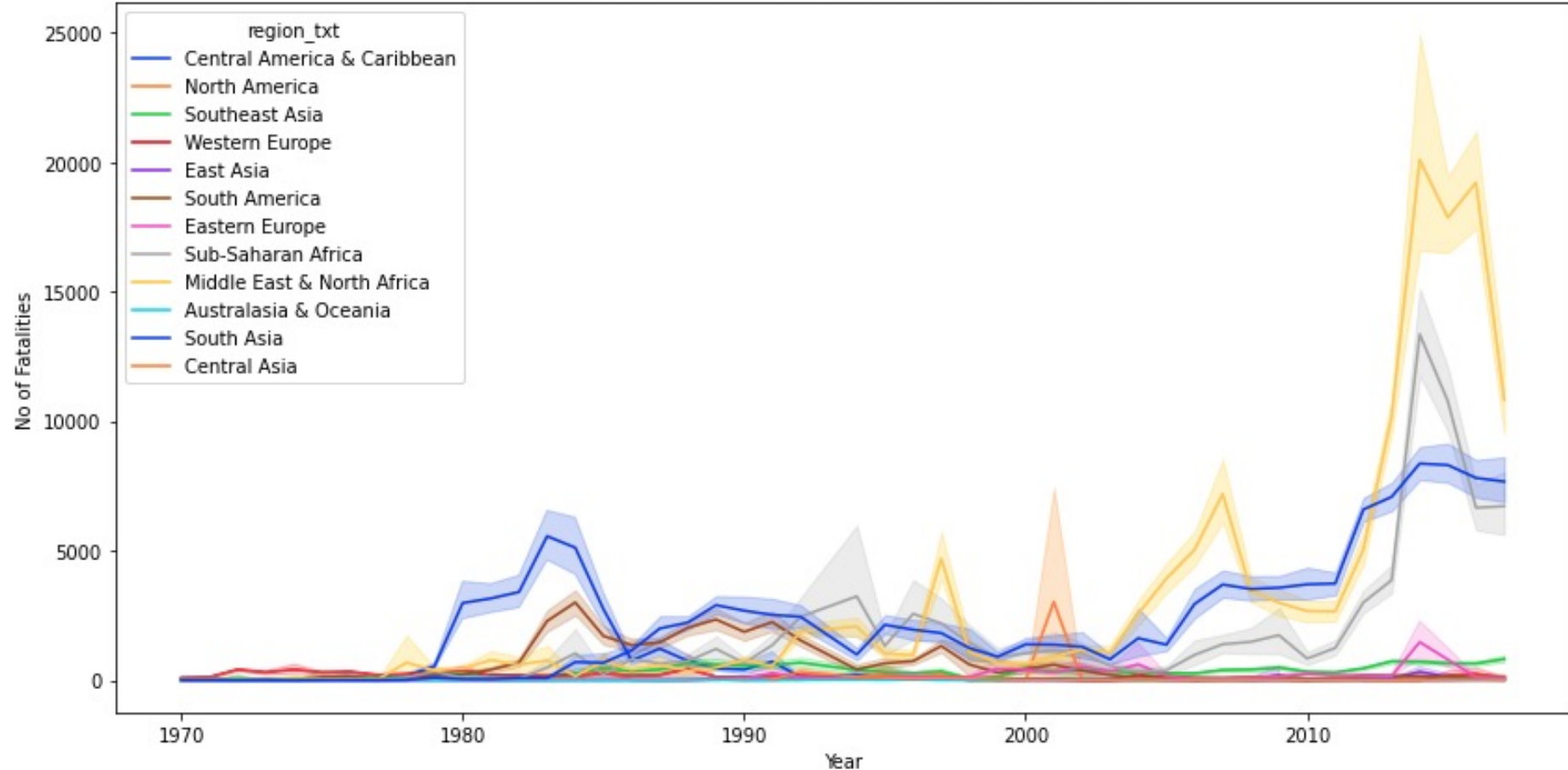


Global trend is indicated by the blue line

Comparing Global Trends and Regional Trends

- The spikes and dips of Middle East & North Africa and Southeast Asia with the Global trends from late 90's, we can reasonably speculate that the three regions plays a vital role in affecting global terrorism.
- The sum of distance under the curves of South Asia and Middle East & North Africa is more than 50% of the distance under the curve of Global.
- Using this observation we can tell that regions South Asia and Middle East & North Africa play an impactful role in Global Terrorism

Terrorist Attacks in different Regions from 1970-2017

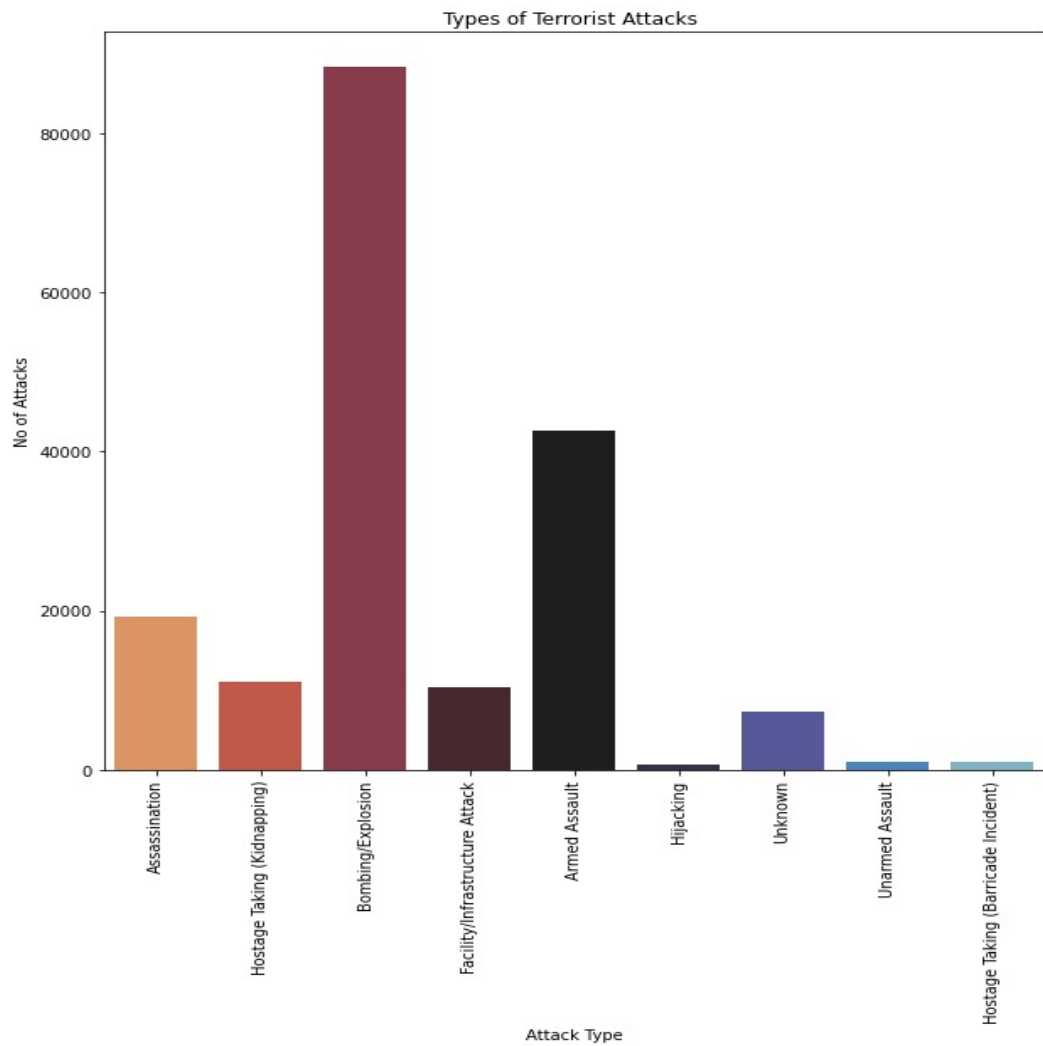


Making sense of the visualization

- Orange line spike near the 2000 indicates September 11 attacks in USA.
- Yellow line spike between mid 2000's and 2010 attributes to the Battle of Gaza between Hamas and Fatah.
- The yellow line dips again in 2009 with the ending of the Gaza war.

3. Analysing the Types of Terror Attacks

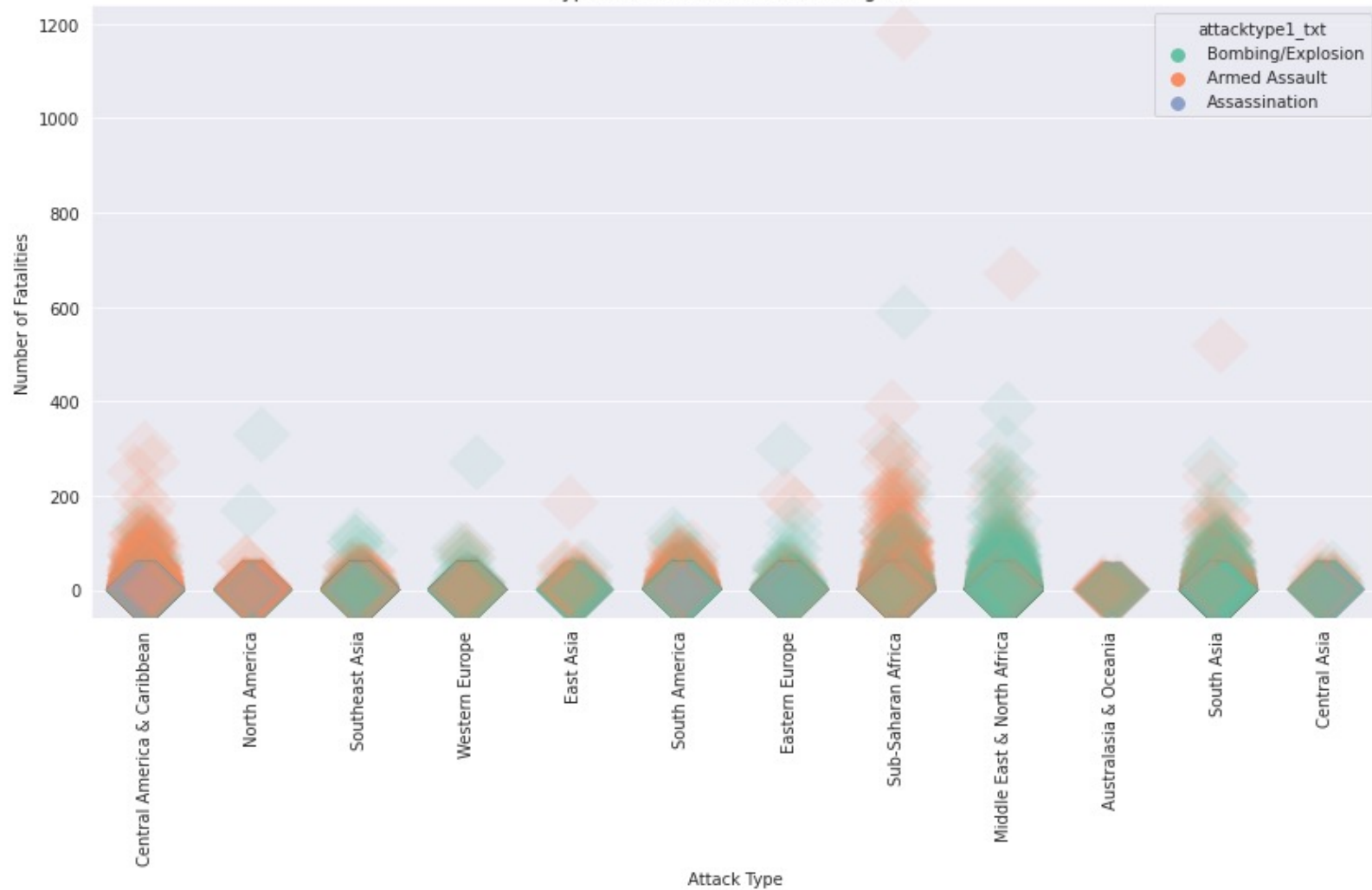
- The 3 most commonly perpetrated types of attack are
 - Bombing/Explosion (more than twice as frequent than Armed Assault)
 - Armed Assault (twice as frequent than Assassinations)
 - Assassination
- The frequency of the top 3 attacks increase by two folds as we move up the ladder.



Top 3 commonly perpetrated attacks in different regions

- Armed Assault is a dominant type of attack predominantly in
 - Central America & Caribbean
 - Sub-Saharan Africa and
 - North America
- Bombings/Explosion is a dominant type of attack predominantly in
 - Middle East & North Africa
 - South Asia and
 - Eastern Europe

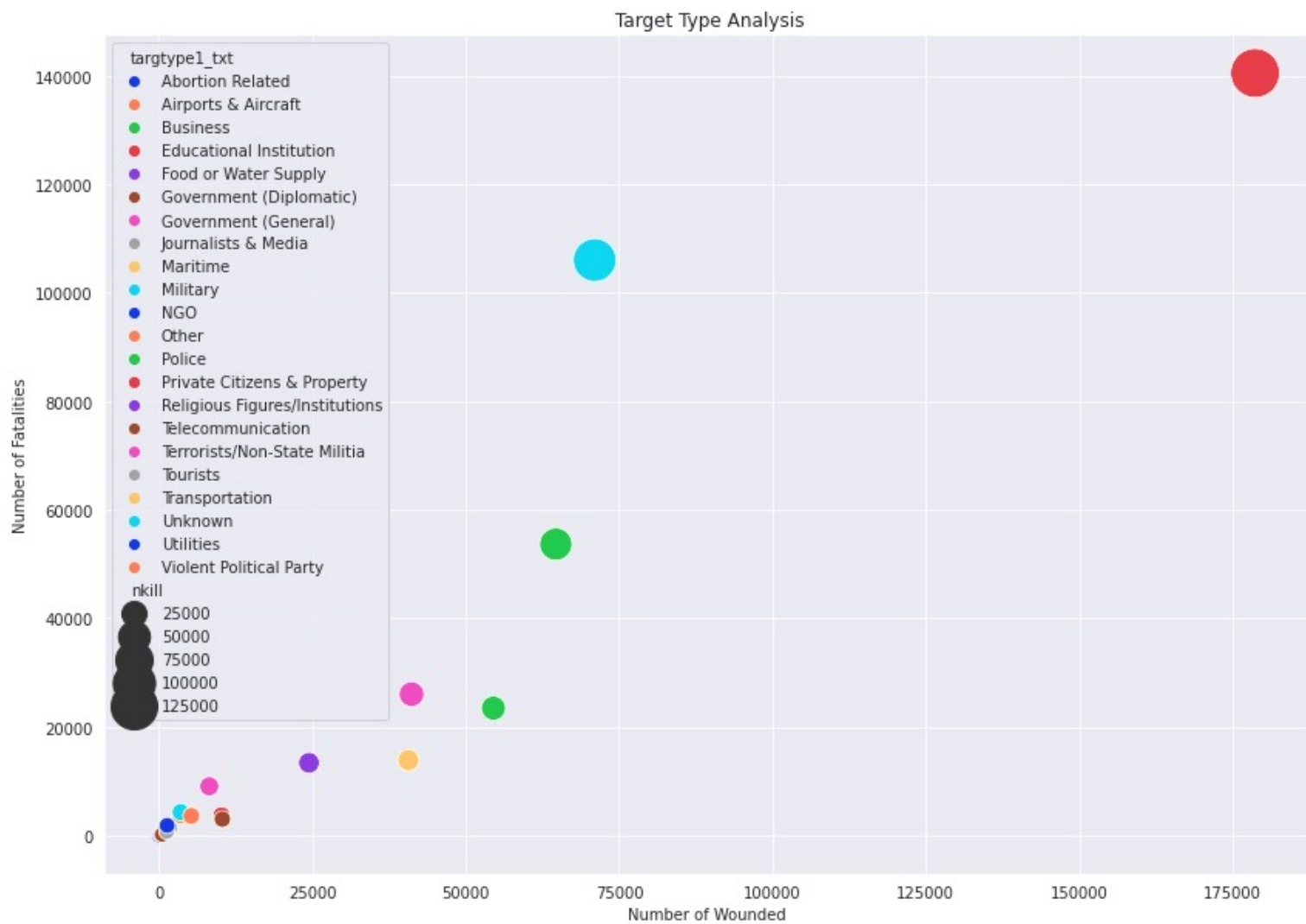
Types of Attacks in Different Regions



4. Analysing Target Types by Fatalities and Wounded

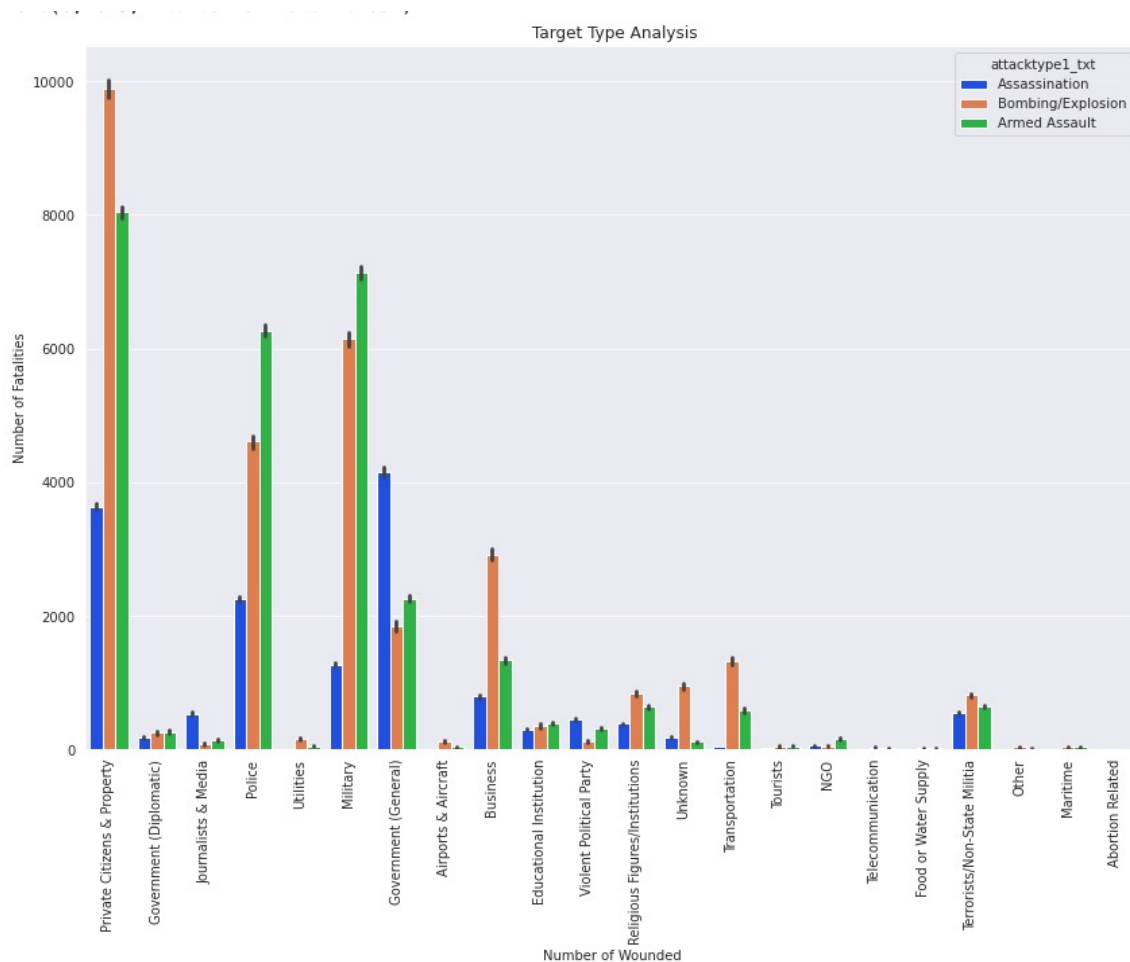
Most Affected Target Types are:

- Private Citizens & Property
- Military
- Police



Common Attacks Perpetrated on different Targets

- Assassination is the most common type attack perpetrated on Government officials and Media Journalists.
- Bombings are frequently used to thwart Businesses and Religious Figures/Institutions
- Police and Military face large amount of armed assaults



Conclusion

- The Civil War between Iraq and Islamic State of Iraq and the Levant (ISIL) has claimed 1570 fatalities, the largest taken in any terror attack
- The top 20% of the Terrorist Organisations have contributed to almost 99% of the crimes. This clearly shows the unequal relationship between actions and consequences verifying Pareto's Principle.
- The most notorious terrorist organisations are Islamic State of Iraq and the Levant (ISIL), Taliban, Boko Haram and Shining Path(SL). These organisations alone have contributed to more than one third of the total fatalities and almost 50% of the total attacks
- Global Terrorism started increasing to an all time high from 2011. This peaked in the year 2014 and started dipping ever since. The regions: South Asia and Middle East & North Africa, play a substantial role in Global Terrorism.

Conclusion Contd.

- The top 3 most commonly perpetrated types of attack are Bombing/Explosion, Armed Assault and Assassination whose common victims are Private Citizens/Property, Government Officials and Journalists respectively. The frequency of the top 3 attacks increase by two-folds as we move up the ladder.
- Armed Assault is a dominant type of attack in Central America & Caribbean and Bombings/Explosion is a dominant type of attack in Middle East & North Africa.
- Most Affected Target types are Private Citizens & Property, Military and Police.
- Islamic State of Iraq and the Levant (ISIL) and Taliban are active from the mid 2010's and Boko Haram are active from 2010. Liberation Tigers of Tamil Eelam (LTTE) are active from late 1980's. Their attacks peaked in mid 1990's and reduced in 2000's. The Irish Republican Army (IRA) have made their attacks constantly from 1970's to 1980's.

References

1. <https://towardsdatascience.com/global-terror-and-the-eda-visualization-rabbit-hole-a953c998b7e9>
2. GTD (Global Terrorism Database) - Codebook: Inclusion Criteria and Variables, October 2019