Capstone Project
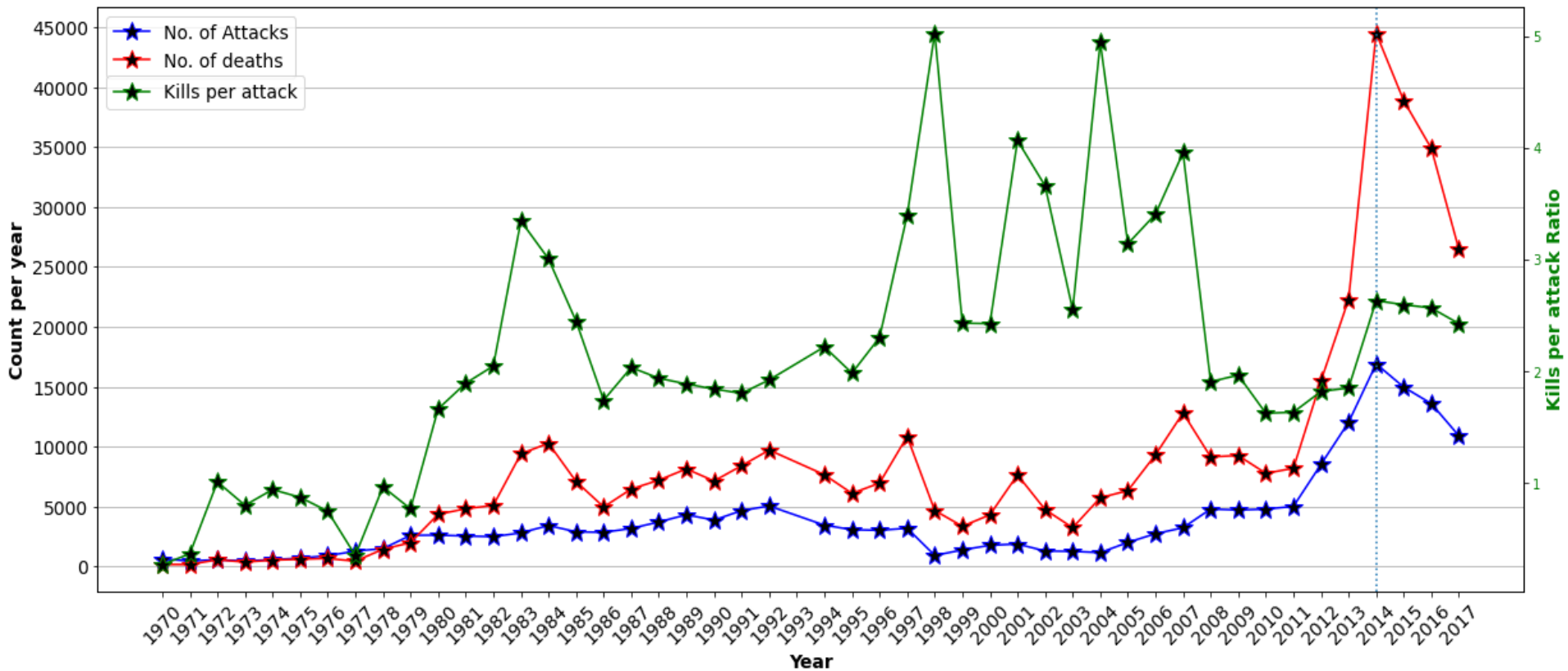## Global Terrorism Analysis

By – Pramathesh Ray

Outline

- Data Summary

- World Statistics
  - Terrorism over the years
  - Terrorism by countries
  - Terrorist Organizations with most attacks
  - Insurgency by countries
  - Attack types by terrorists
- Comparing Terrorism in Middle East and Latin America
- India Statistics
  - Terrorism over the years
  - Terrorism by states
  - Insurgency by states
  - Terrorism in Jammu and Kashmir timeline
  - Attack type used and Targets by the terrorists
  - Terrorist Organizations with most attacks
  - Maoism in India

AI

Data Summary

- **'eventid'** : Serial number of particular incident, useful to keep count of incidents
- **'iyear'** : year of the incident
- **'country_txt'** : country in which the incident occurred
- **'region_txt'** : region in which the incident occurred
- **'provstate'** : state or province of the country in which the incident occurred
- **'alternative_txt'** : type of attack if it was not terrorist for certain
- **'attacktype1_txt'** : general method of attack used (i.e. assassination, hijacking, bombing/ explosion, etc.)
- **'targtype1_txt'** : general type of target/victim (i.e. business, government, police, military, etc.)
- **'gname'** : terrorist group responsible for the attack
- **'nkill'** : number of dead
- **'nwound'** : number of wounded
- **'property'** : was property damaged during the attack?
- **'propextent_txt'** : type of property damage (major, minor or catastrophic in terms of monetary value)
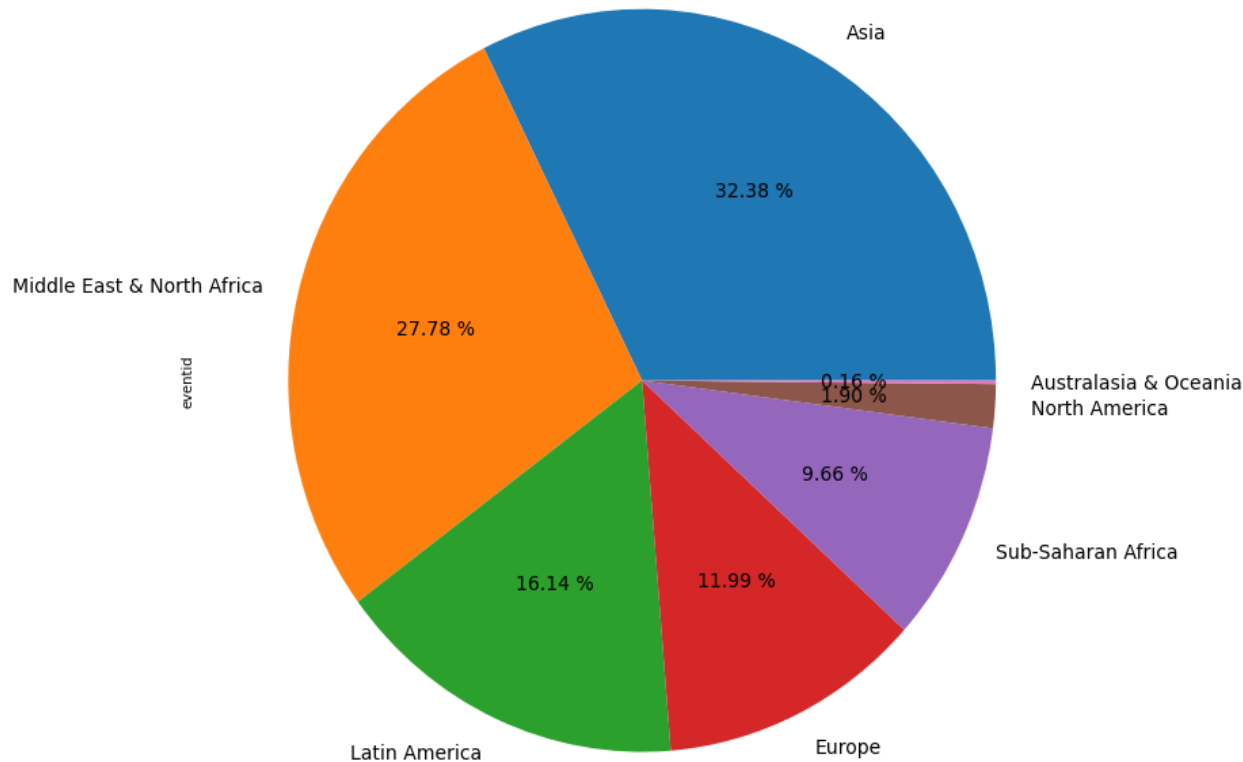
Global Terrorism over the Years

Legend:
- No. of Attacks
- No. of deaths
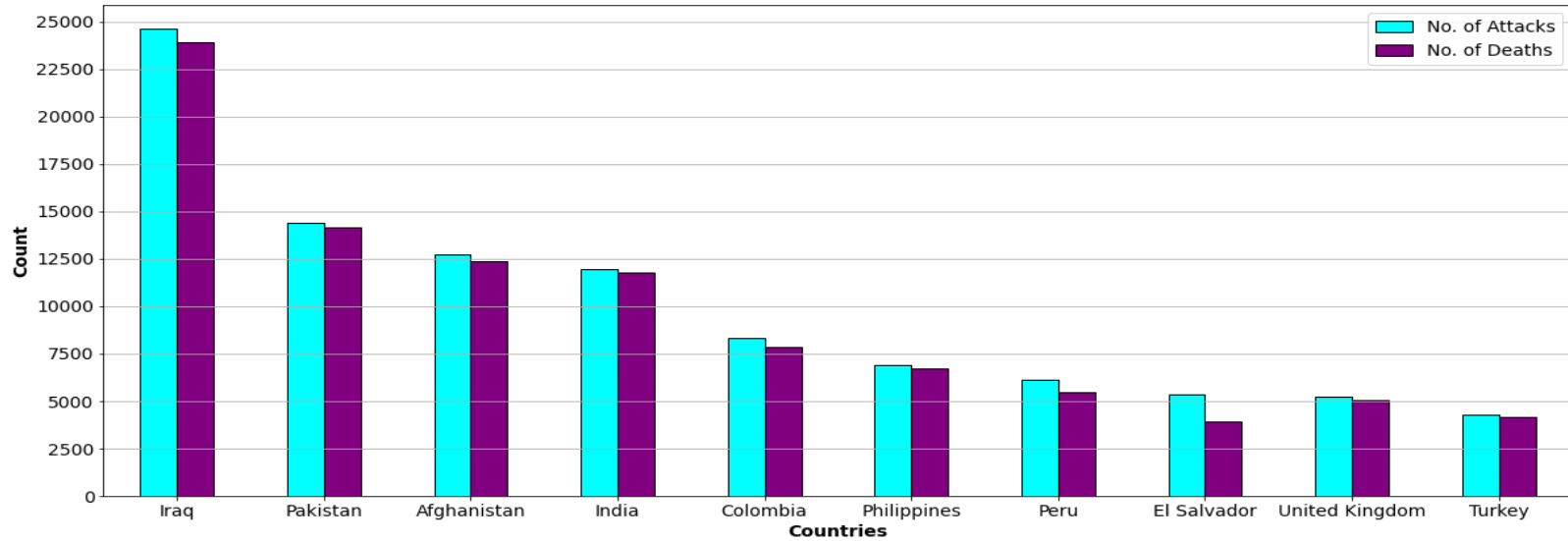- Kills per attack

Global Terrorism over the Years

- 1970s were peaceful years. 1980s saw a rise in terrorism.
- The early 2000s saw a marginal drop in attacks but kills per attack ratio remained high.
- Since 2007, attack count and death count have manifolded.
- 2014 was the most violent year in terms of both attack count and death count.
- Since then, drop in terrorist activities is seen but still it is higher than any other time period.
- The kills per attack ratio was higher in late 1990s and early 2000s than any other period.

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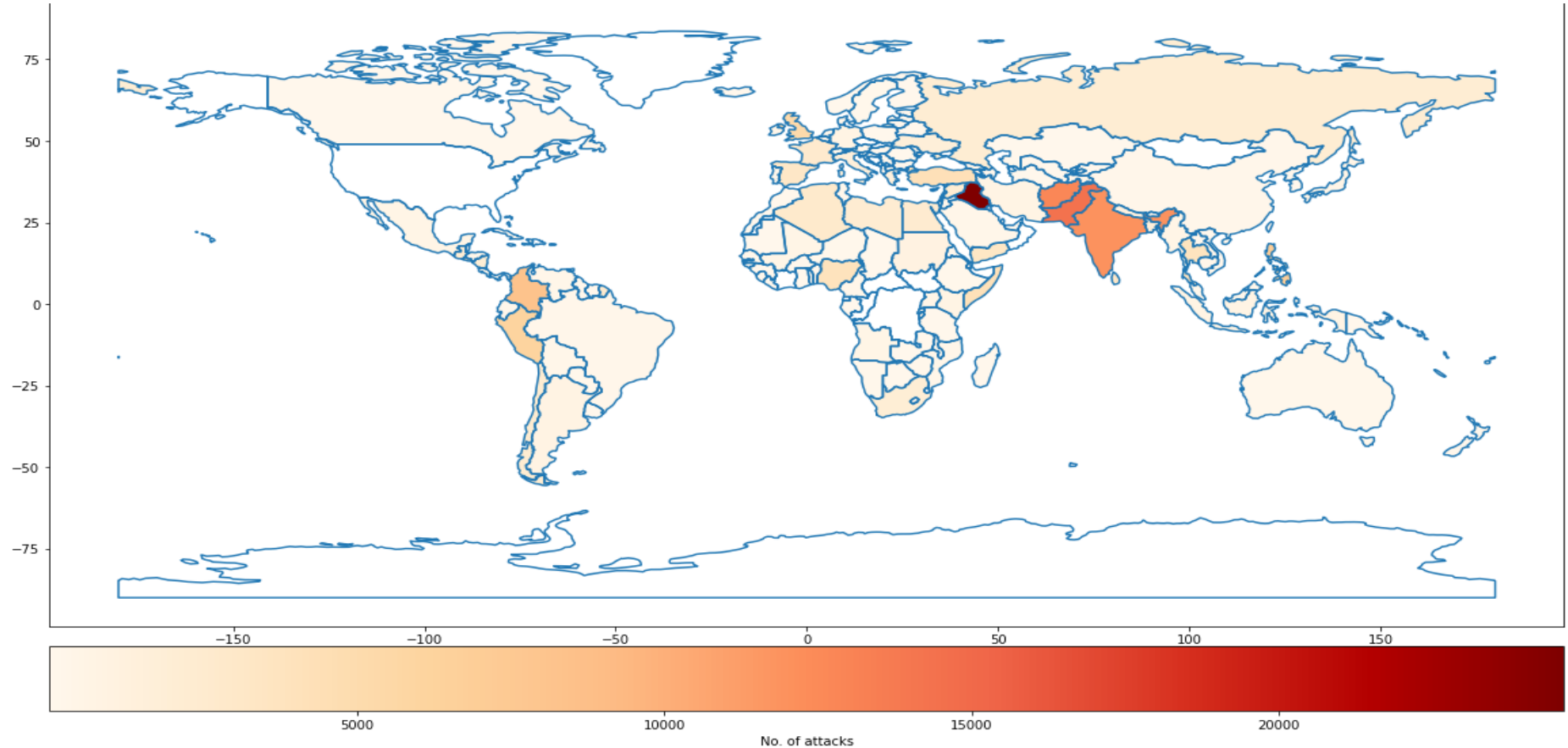# Region-wise distribution of terrorist attacks

- Asia saw most number of attacks closely followed by Middle East & North Africa.

- Australasia & Oceania which comprises of countries of Australia, New Zealand and other small island nations is the most peaceful region with less than 1% of total attacks.

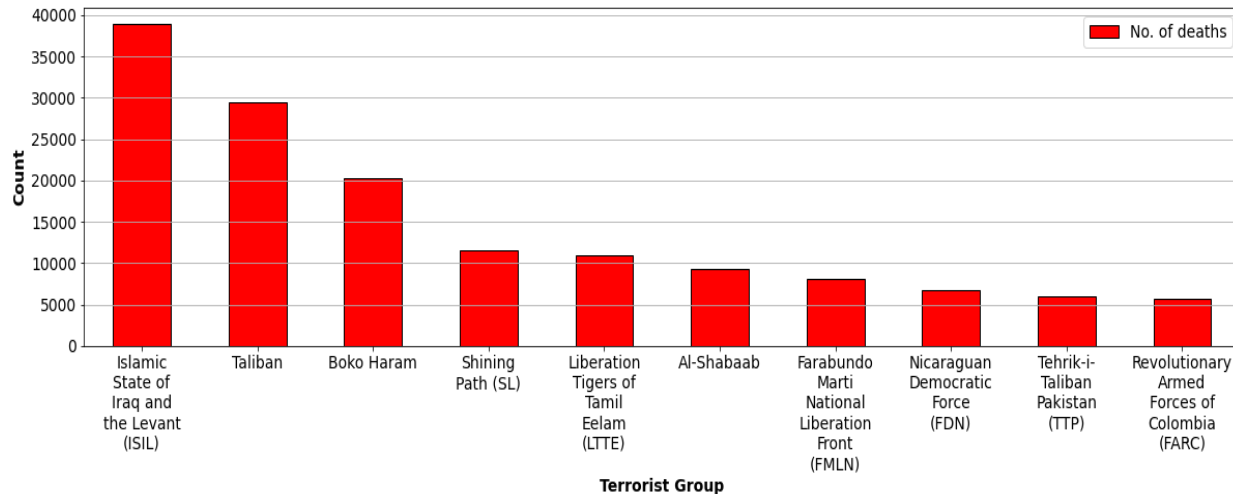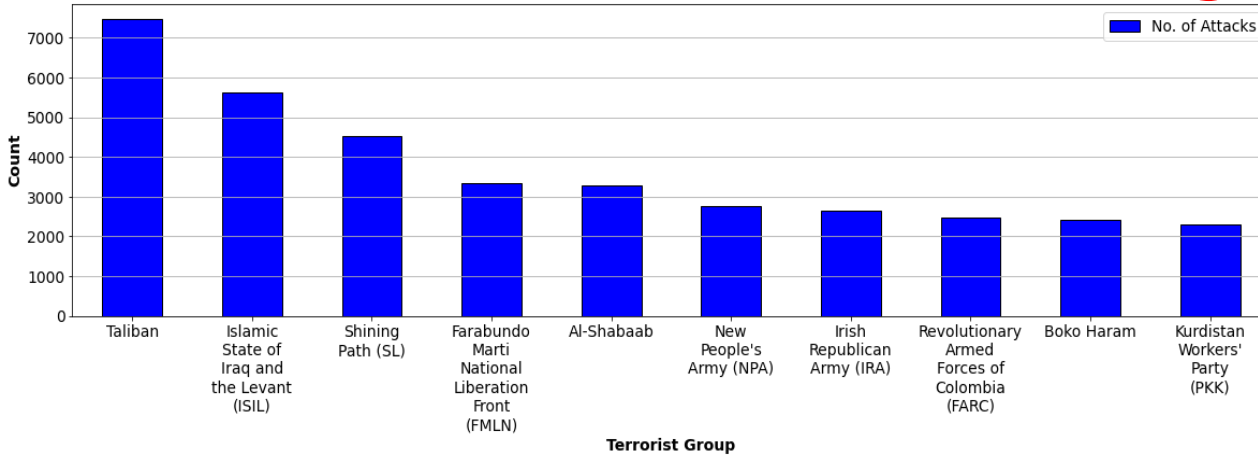# Top 10 countries with most terrorist attacks

- Iraq is in a league of its own with almost 25000 attacks and death count respectively, making it world's most violent country.

- Pakistan and Afghanistan complete the 2nd and 3rd place respectively. Unfortunately, India is not far behind, claiming the 4th spot.

- Most of the countries belong to the region of "Middle East and North Africa", "Asia" and "Latin America" which were the top 3 violent regions as seen in the pie chart.

World map showing countries with terrorist attacks

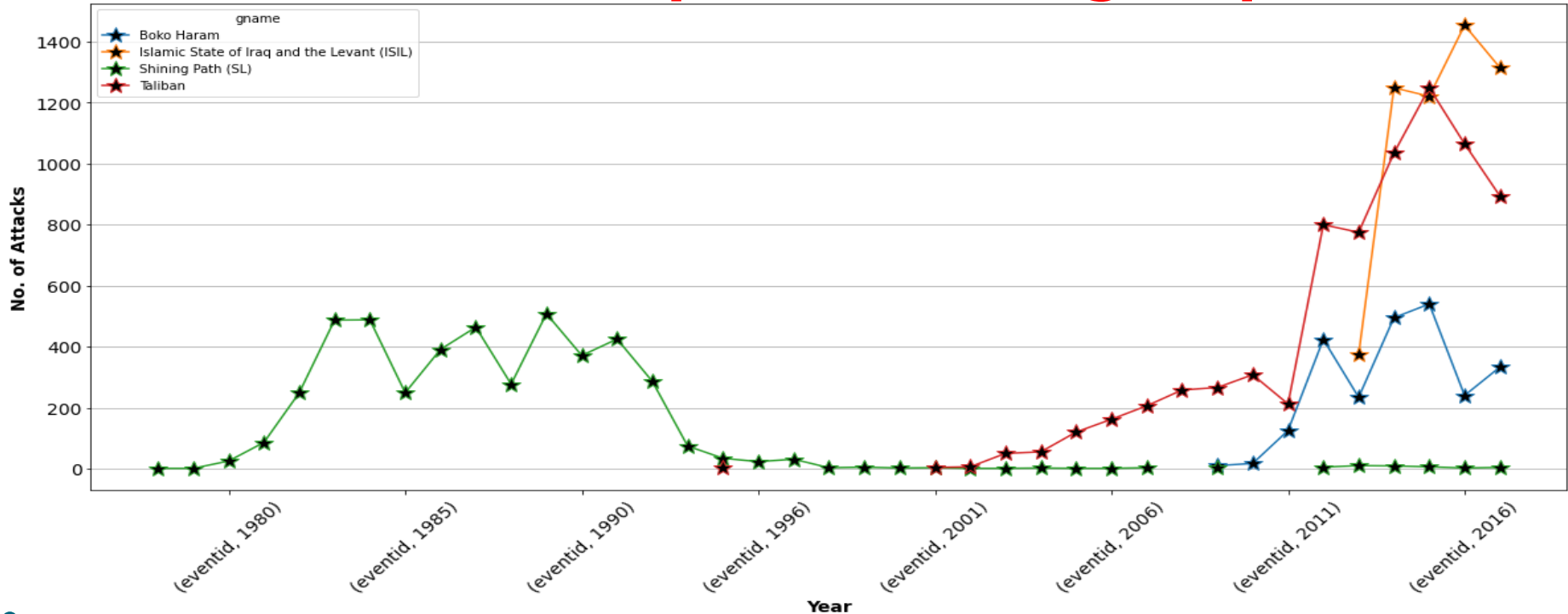No. of attacks

Most Violent Terrorist Organizations

- Taliban has conducted more than 7000 attacks. Islamic State (ISIL) follows on 2nd rank.

- In terms of killings however, ISIL tops with around 40000 killings followed by Taliban with around 30000 killings.

- Shining Path is 3rd in terms of no. of attacks and 4th in terms of no. of killings.

- Boko Haram which came 9th in terms of no. of attack is on 3rd in terms of killings.

Most Violent Terrorist Organizations

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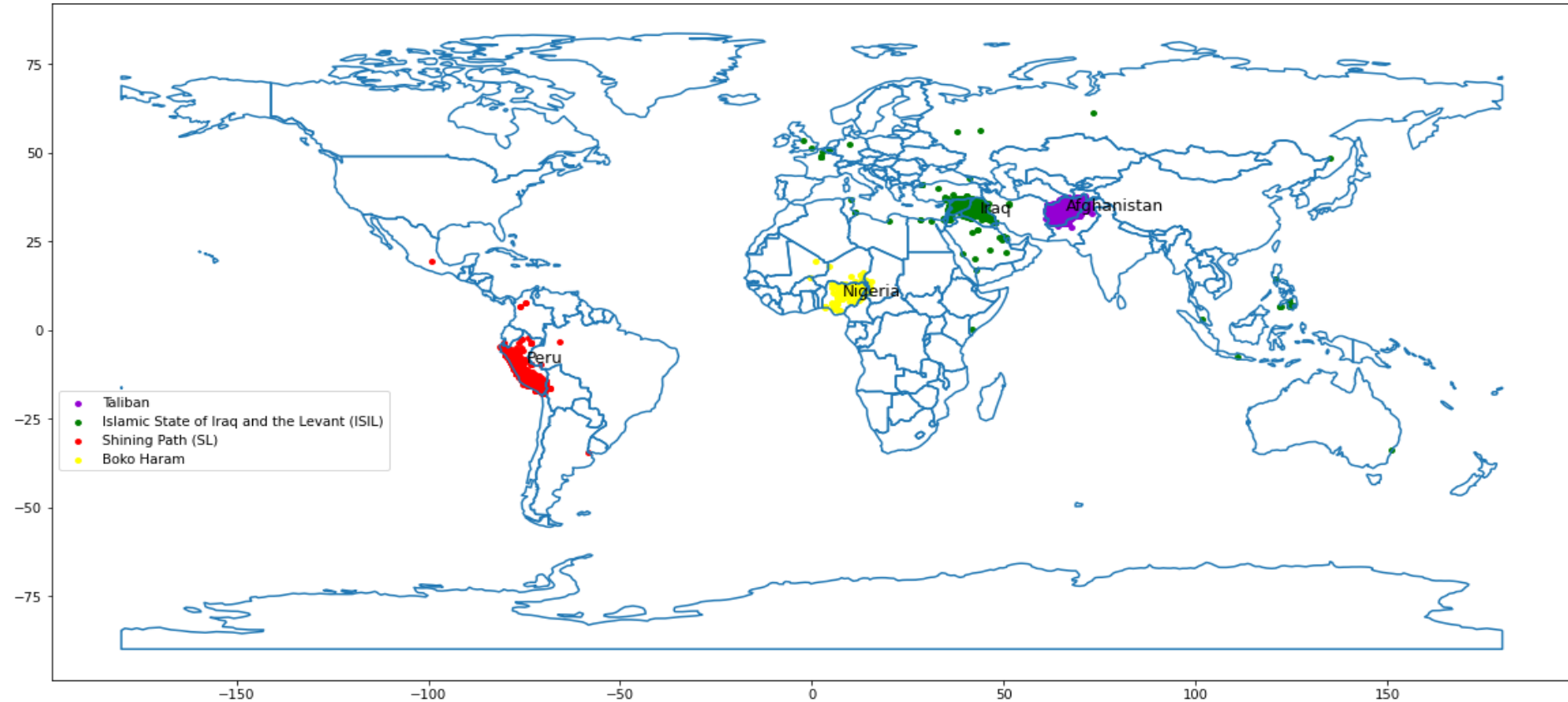| gname	Kills per attack
Boko Haram	8.406948
Islamic State of Iraq and the Levant (ISIL)	6.934438
Taliban	3.936270
Shining Path (SL)	2.535525

- Another metric to measure the violence of terrorist organizations is to find 'Kills per attacks ratio.'

- Here, we measure the 'Kills per attack' ratio for those 4 terrorist organizations.

- Boko Haram has most violent attacks measuring more than 8 kills per attacks followed by ISIL with almost 7 kills per attacks.
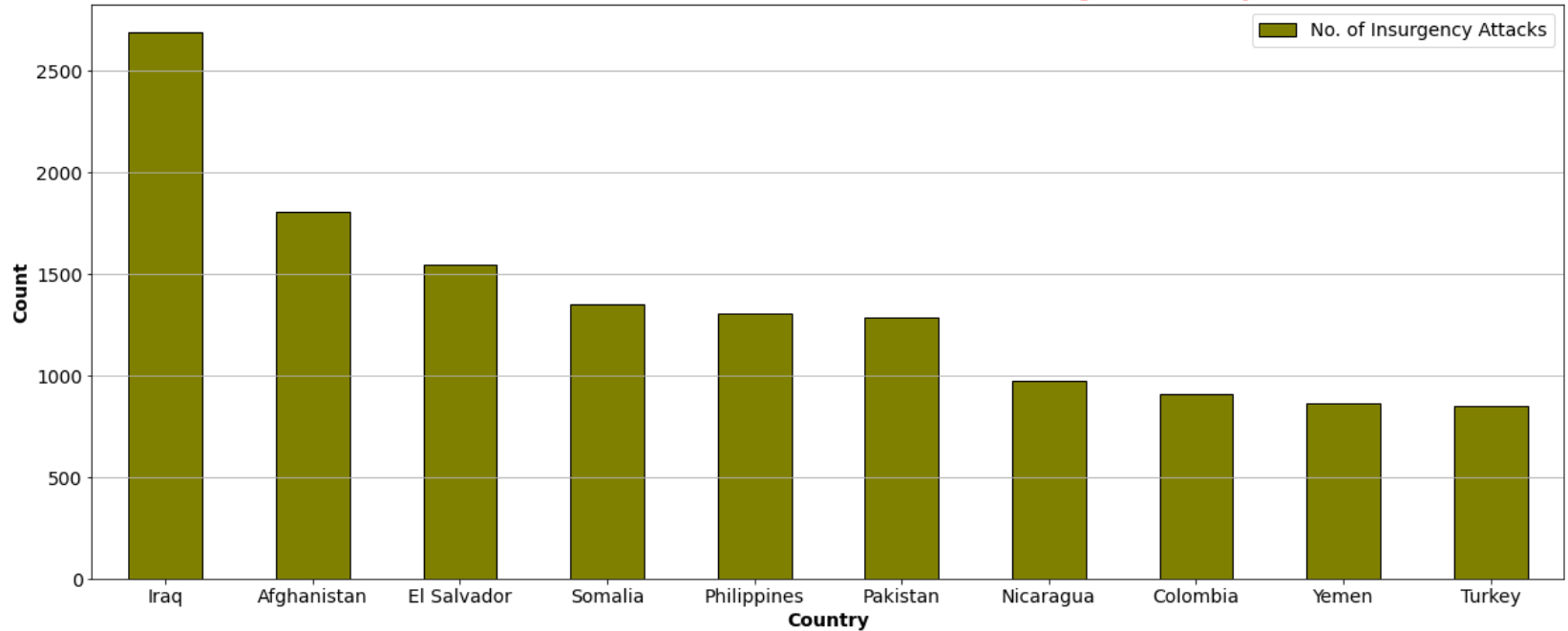
Timeline of top 4 terrorist groups

- Shining Path group was active in the 80s and early 90s when none other of the 3 were active. Since then it conducted almost negligible attacks.

- Boko Haram, Taliban and ISIL have started expanding their operations since 2011. Boko Haram have performed less no. of attacks than Taliban and ISIL even though its death count was significantly high.

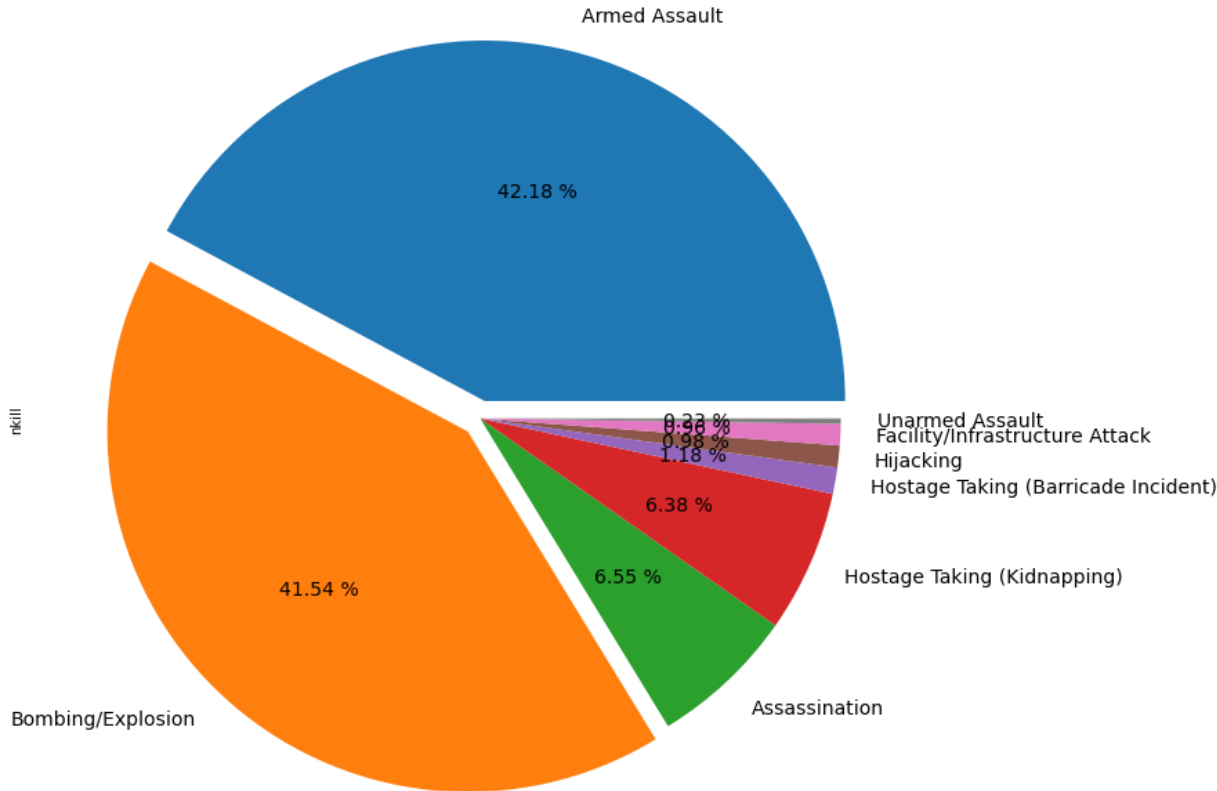# World map showing attacks by top 4 terrorist organizations

The map shows the countries facing most attacks by these terrorist groups namely Afghanistan by Taliban, Iraq by ISIL, Nigeria by Boko Haram and Peru by Shining Path.

Top 10 countries with most insurgency attacks

- Iraq tops the list here again with more than 2500 insurgency attacks, Afghanistan and El Salvador completing the top 3 positions.
- This signifies political crises in these countries and changing of political regimes frequently, as insurgencies aim in toppling the current authority and more number of insurgencies will weaken the pillars of foundation of the government.
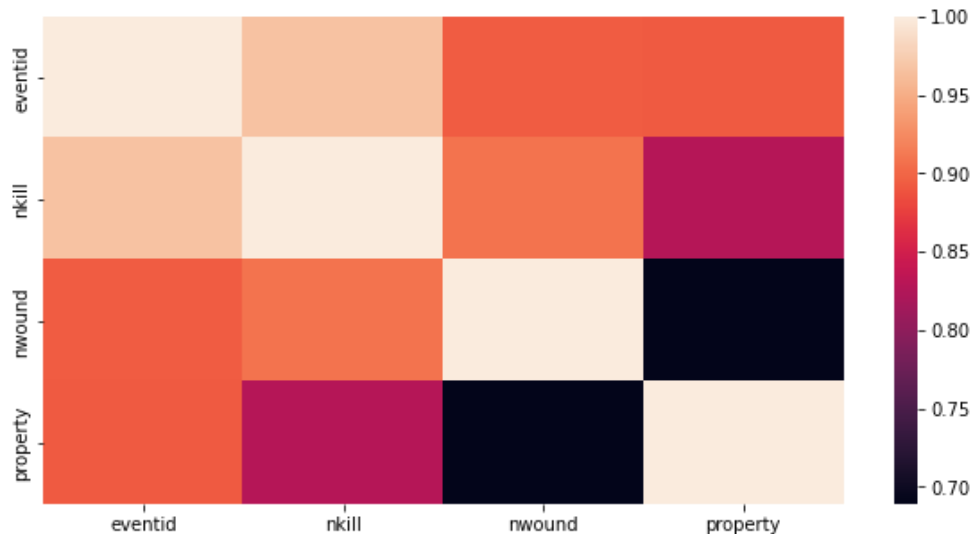
Deadliest type of attacks

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- Pie chart shows the distribution of killings by a particular attack type used by the terrorist, as percentage of total no. of deaths.

- Armed Assault and Bombing/Explosion combined have taken more than 80% of lives than any other attack.
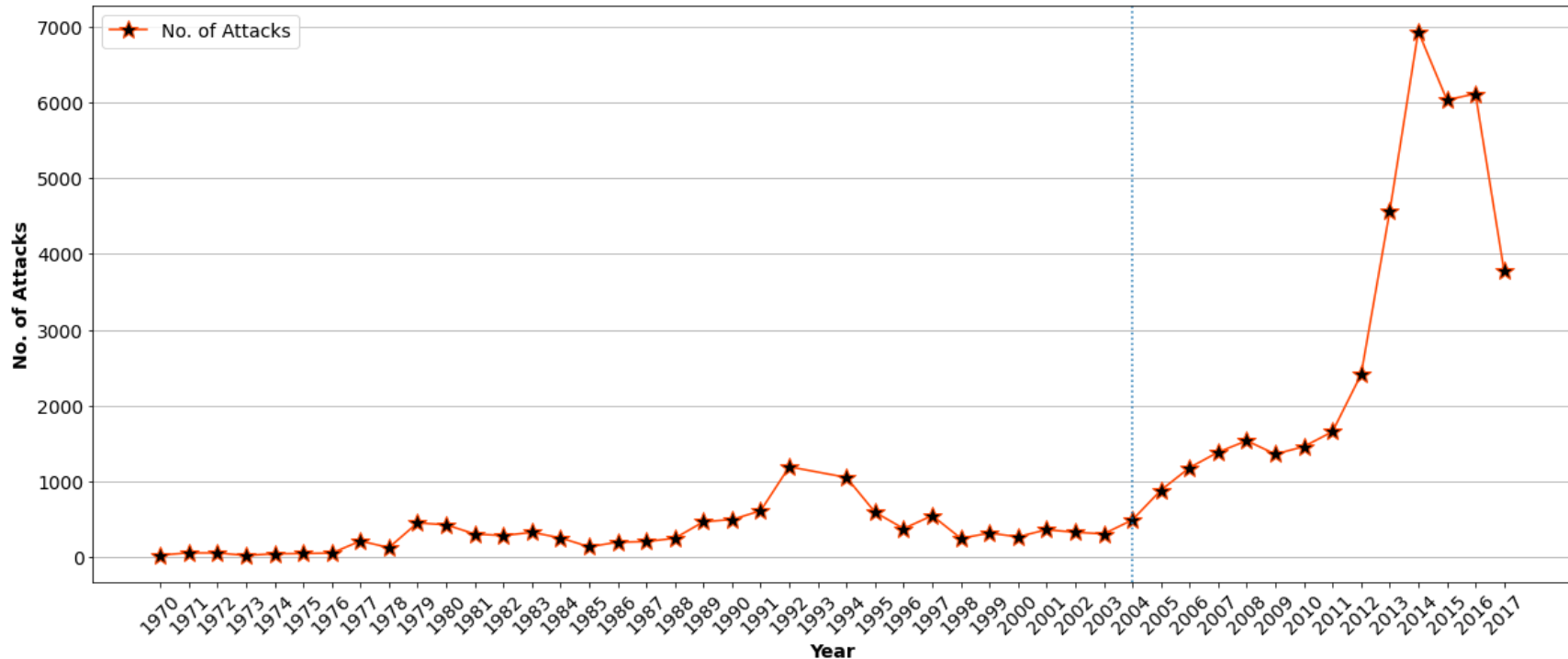
Correlation

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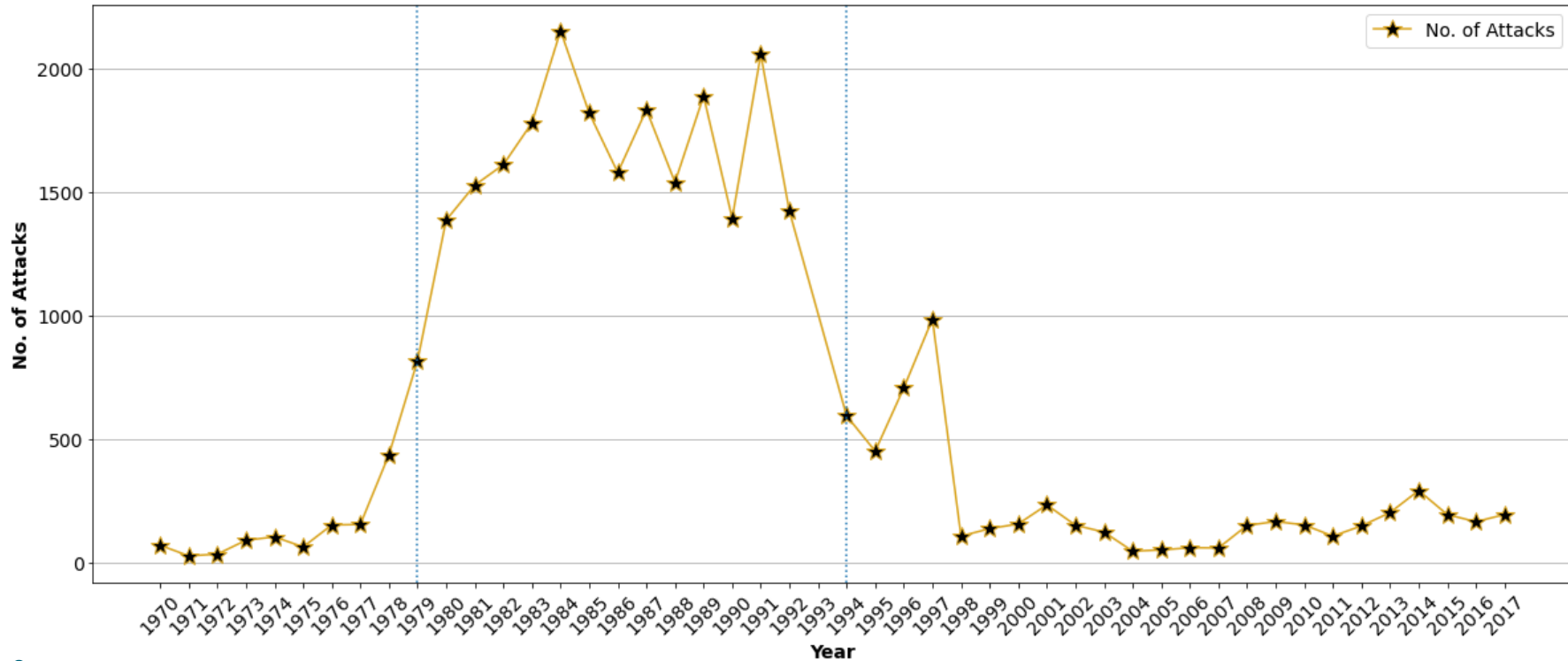|	eventid	nkill	nwound	property
eventid	1.000000	0.966331	0.894096	0.892512
nkill	0.966331	1.000000	0.907927	0.827706
nwound	0.894096	0.907927	1.000000	0.689307
property	0.892512	0.827706	0.689307	1.000000

- Our general conscience says more the number of attacks, more the number of deaths and wounded.

- Correlation Table and its heatmap shows correlation between "No. of Terrorist attacks", "No. of Deaths per attack", "No. of wounded per attack" and "Count of Property damaged".

- All variables have positive correlation, which is obvious. More the number of attacks, more the number of deaths, more the number of wounded and more the property damage.

- Relatively lower correlation coefficient is seen between number of wounded and property damage, so a weak inference can be drawn that properties or buildings have protected people from the impact of an attack.
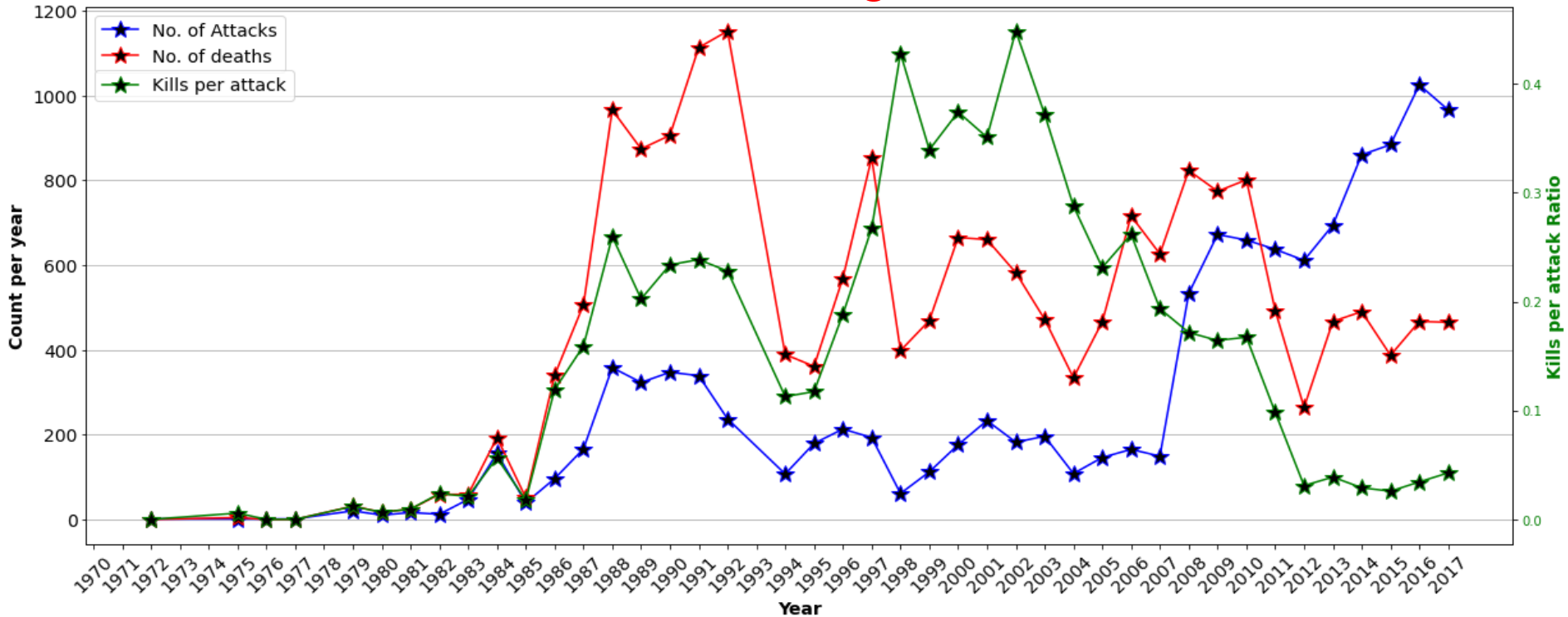
Timeline of terrorist attacks in Middle East

- The line-plot shows the timeline of terrorist attacks in the region of Middle East & North Africa.
- Middle east region was a peaceful region compared to other regions, but things have changed since this millennium. Particularly after 2004, terrorist attacks have increased drastically.

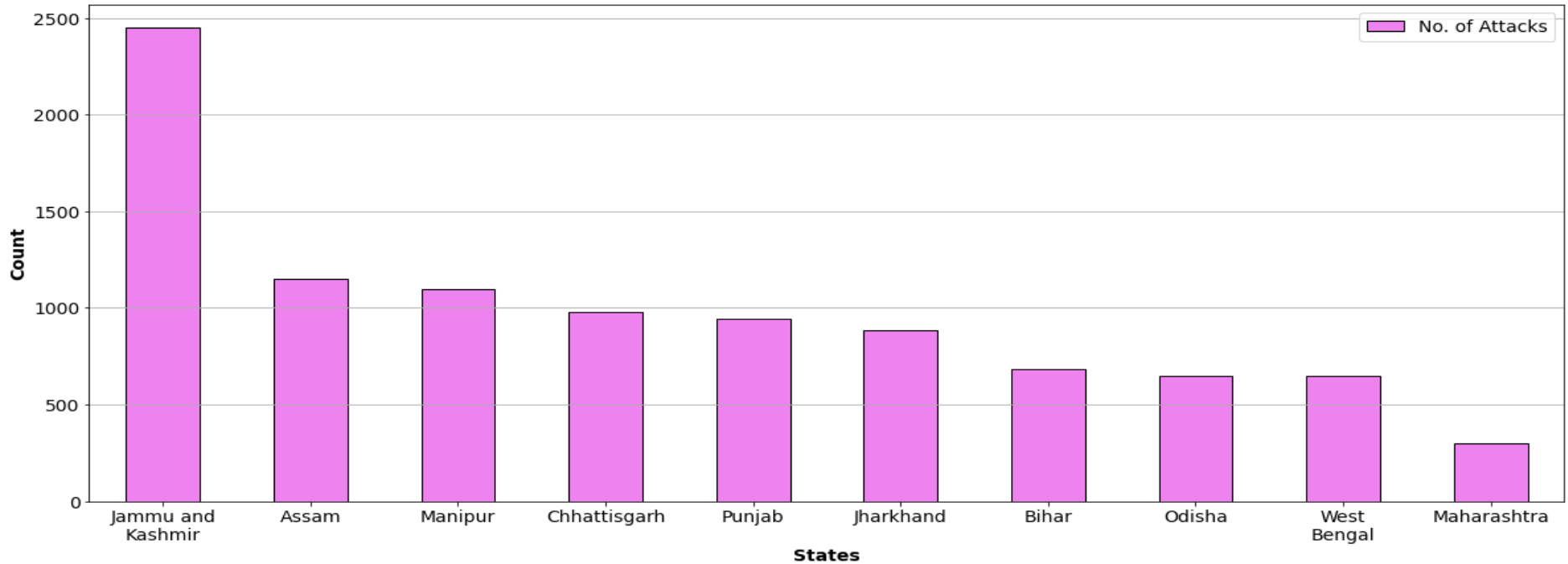# Timeline of terrorist attacks in Latin America

- The line-plot shows the timeline of terrorist attacks in the region of Latin America.
- Terrorism was high since late 1970s to early 1990s. It reduced substantially in following years compared to the 1980s.
- This is in contrast to Middle East region.
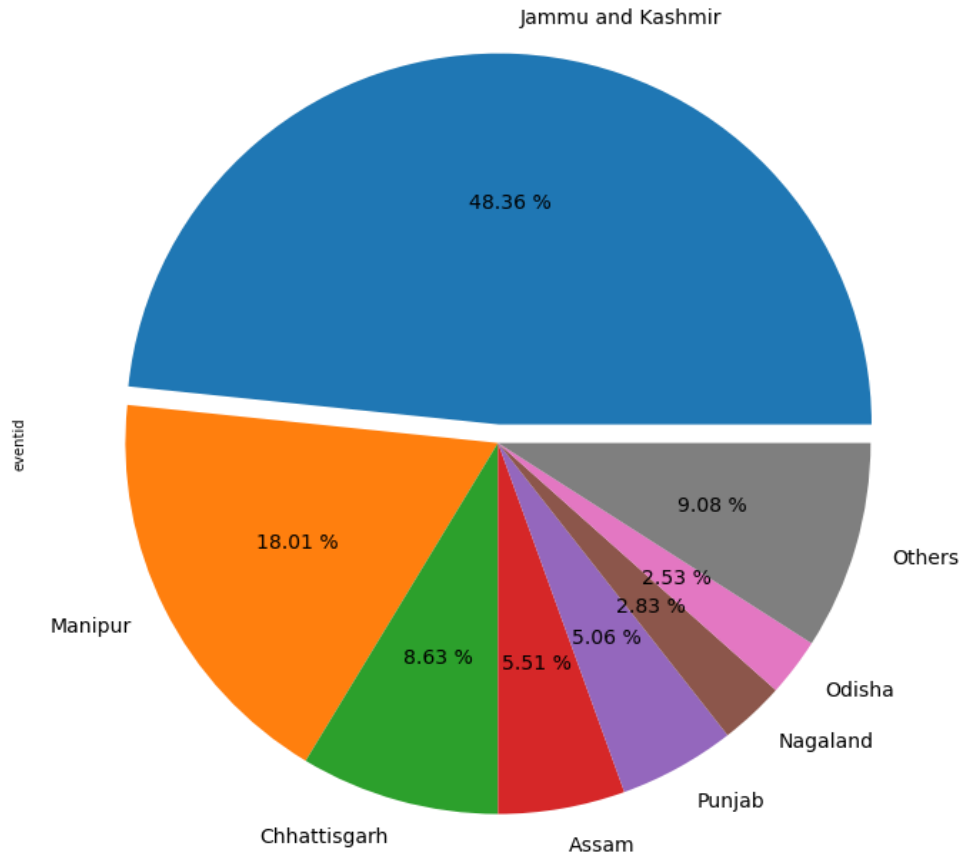
Terrorism over the years in India

Peace prevailed India in the 70s and till mid 80s. Since mid 80s, there has been a constant rise in terrorist attacks along with death count. Since 2007, attacks have increased drastically.

However, in recent times India has managed to keep death count low even though attacks have risen. This is in contrast to the times in 90s where less attacks resulted in more deaths.

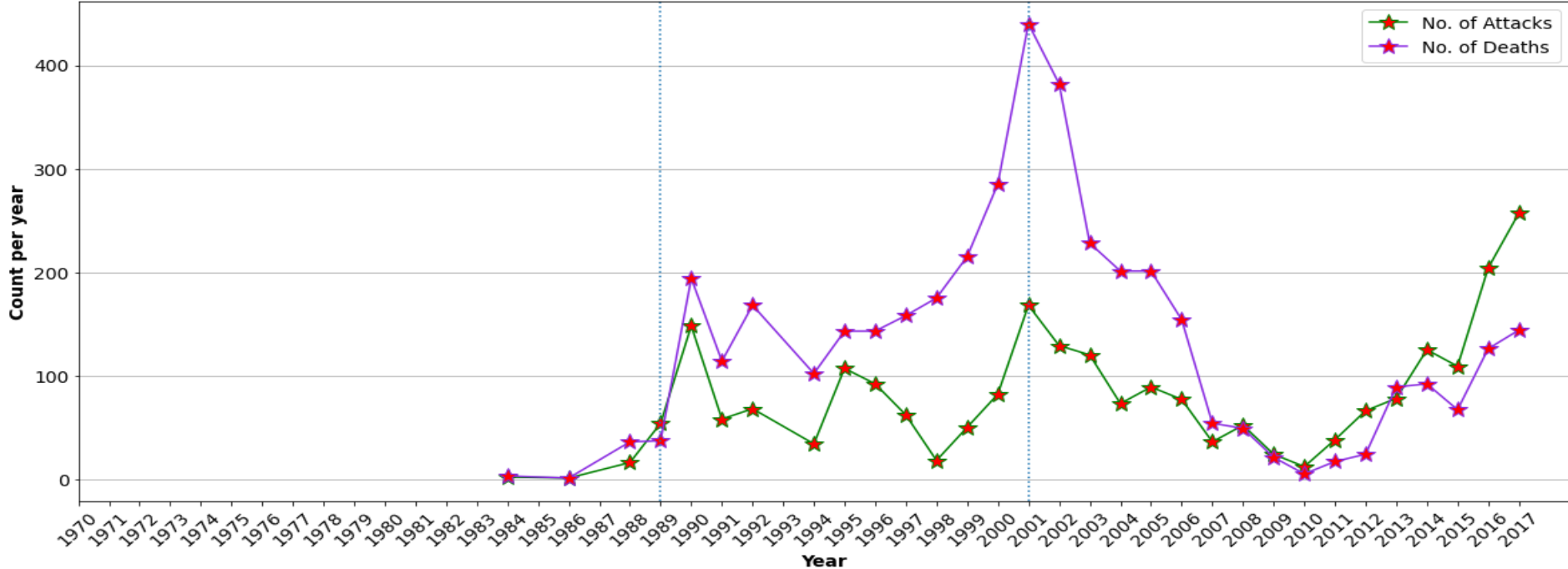# Top 10 Indian states with most terrorist attacks

- Jammu and Kashmir has faced the most number of attacks than any other state in India, way ahead than the 2nd placed Assam. Manipur, Chhattisgarh and Punjab complete the top 5 with comparable numbers.

Indian States with most insurgencies

- Jammu and Kashmir topped the charts for most no. of terrorist attacks. The Kashmir Insurgency could be a reason for that. To confirm we check the insurgencies in India.

- Jammu and Kashmir has indeed faced most no. of insurgency attacks, almost half in the country and more than twice than 2nd placed Manipur.

- One thing to notice is the top 5 states here were also present in the top 5 of most no. of attacks, meaning most of the terrorist attacks in the country are part of some insurgency.
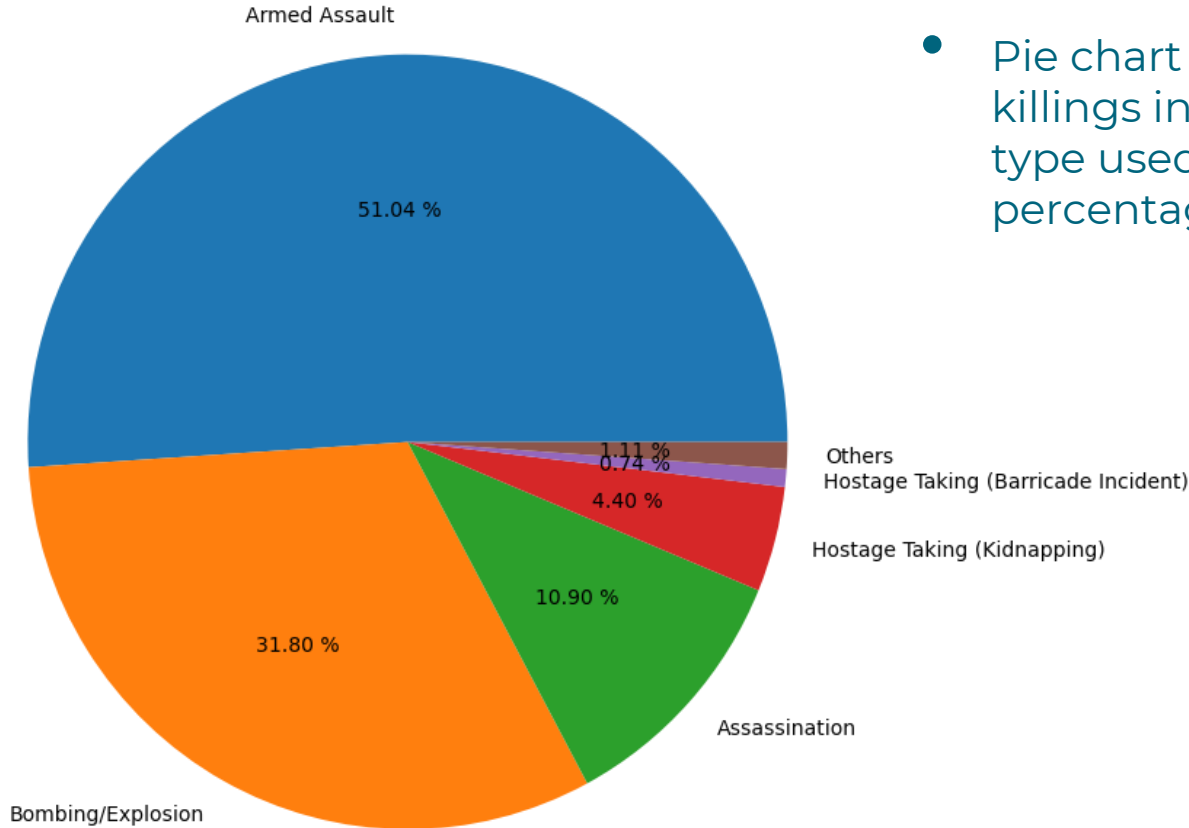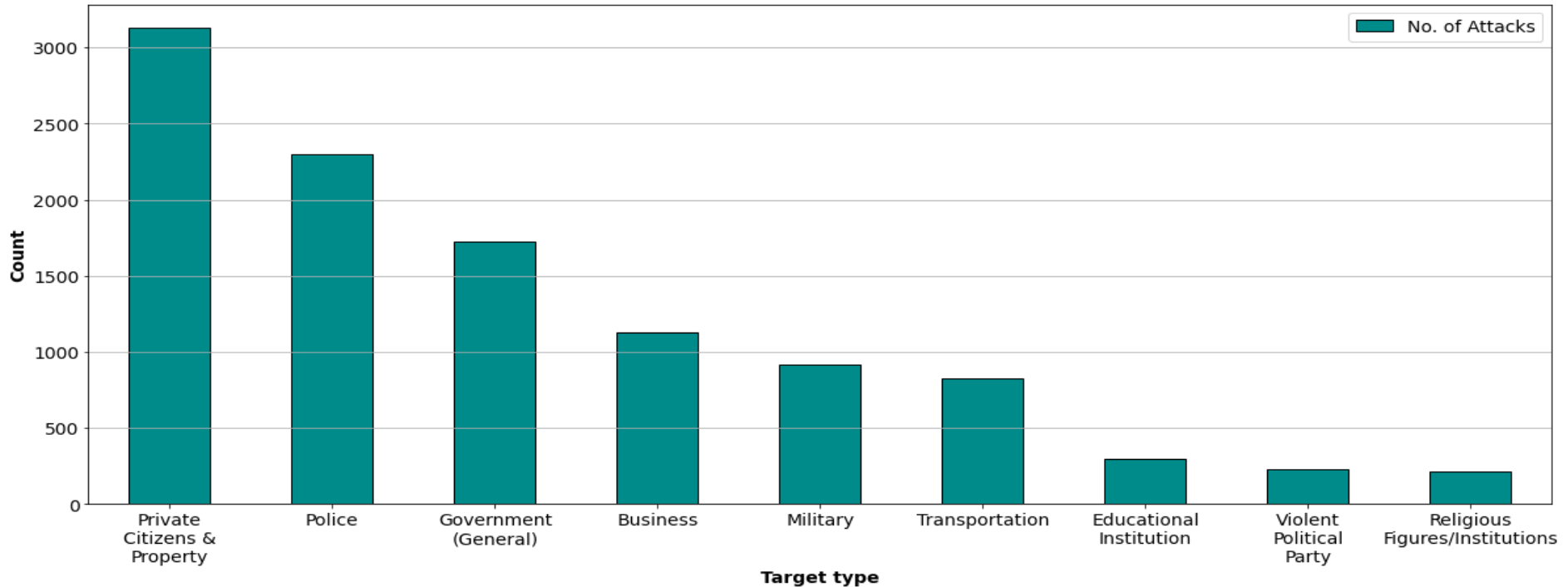
Timeline of terrorist attacks in Jammu & Kashmir

Jammu and Kashmir was peaceful till the late 80s. Since 1989, which marks the beginning of the Kashmir Insurgency, it has witnessed high amounts of attacks resulting in high death rate. Violence peaked in 2001. Period between 2007 to 2012 saw a relatively lower attacks, however it has been on the rise ever since then.

Deadliest type of attacks in India

- Pie chart shows the distribution of killings in India by a particular attack type used by the terrorist, as percentage of total no. of deaths.

- Armed Assault has taken more than half of lives followed by Bombing/Explosion meaning these are the preferred methods by the terrorist.
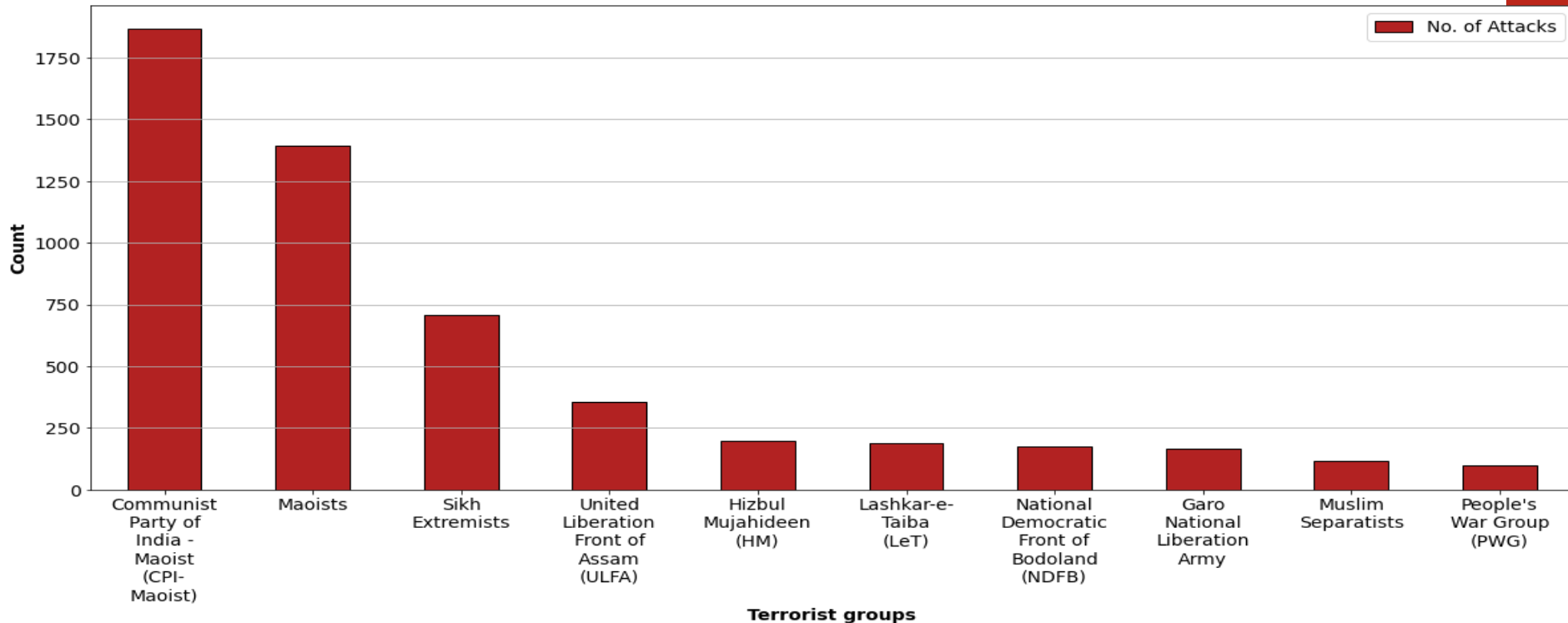
Terrorist's targets in India

- Terrorists have attacked Private Citizens and Property most no. of times. They also have targeted the Police and Government properties.
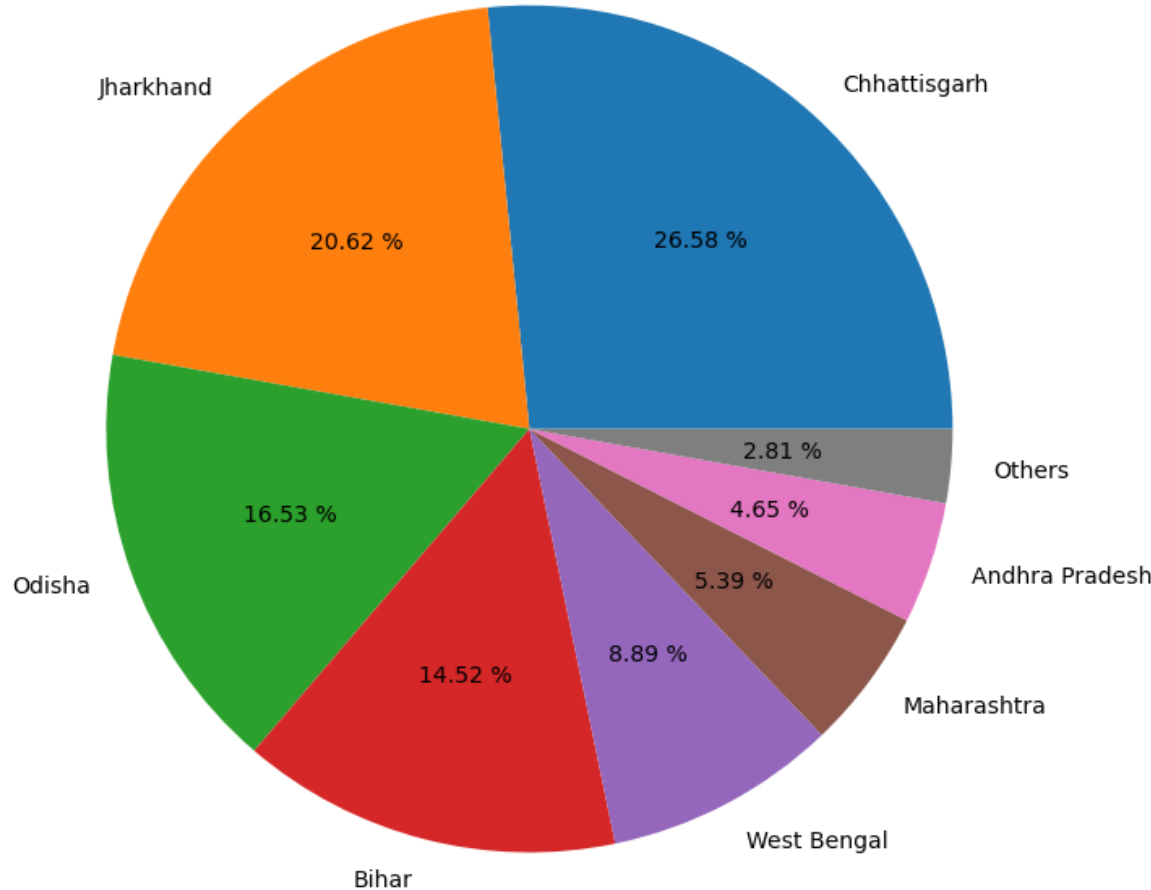
Terrorist Organizations with most number of attacks in India

The philosophy of Maoism has made a strong footprint in India through terrorism, as evident in above graph where the top 2 groups follow Maoism. If all Maoism groups are combined, they have conducted most no. of attacks in India than any other group.

Indian States affected by Maoism

- Pie chart shows the distribution of attacks in India by Maoist groups, as percentage of total no. of Maoist attacks.

- The Eastern part of India is the hotbed for Maoism, consisting of the top 5 states from above chart namely Chhattisgarh, Jharkhand, Odisha, Bihar and West Bengal. Almost 90% of Maoist activities have taken place in these states.

Conclusion

1. Before 2000s, global terrorist activities remained comparatively lower than period after 2000s which reached peak in 2014. Although since then, drop in terrorist activities is seen but still it is higher than any other time period. Kills per attacks ratio which were at high during late 90s and early 2000s has reduced after 2007. 1970s were the most peaceful period.

2. Regions of Asia and Middle East & North Africa saw most no. of terrorist activities. Australasia & Oceania is the most peaceful region. Iraq saw the most attacks as a country.

3. Terrorist organizations of Islamic State of Iraq and the Levant (ISIL) and Taliban have conducted most no. of terrorist activities. Boko Haram has the highest Kills per attack ratio.

4. Iraq tops the list of countries with most insurgency attacks.

5. Regions of Middle East & North Africa and Latin America had a contrasting trend in terrorism where Latin America had most of the terrorism in 1980s and early 1990s which subdued later, Middle East & North Africa saw the rise in terrorism mainly after 2000.

6. Terrorism in India increased after mid 1980s. Since 2007, attacks have increased drastically. However, India has managed to keep the death count low in recent times compared to period before 2007.

7. Jammu & Kashmir has seen the most no. of terrorist attacks and most no. of insurgency attacks among the Indian states, particularly after 1989.

8. Armed Assault and Bombing/Explosion are the types of attacks that have taken most lives globally and also in India.

9. Maoist groups have had the most no. of terrorist attacks in India. They have operated mostly in Eastern states of Chhattisgarh, Jharkhand, Odisha and Bihar.

Challenges

1. The dataset had too many variables (135 columns). It was difficult to view all data at once for preliminary data exploration. Also analysis on all columns was difficult.

2. Columns were not properly named. To know the contents of a column was challenging.

3. The data had too many 'Nan' and 'Unknown' values.

4. Inconsistent data in 'Day' and 'Month' column and in binary variables.

THANK YOU