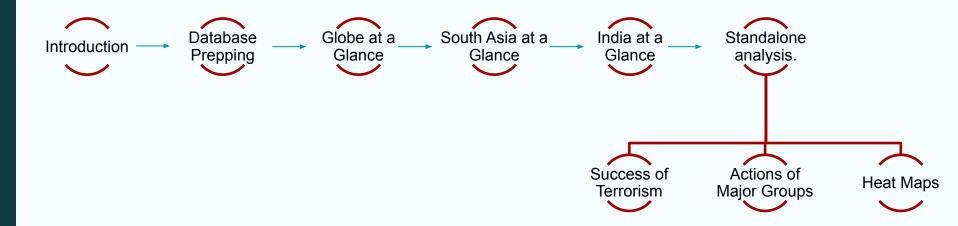# Capstone Project:
# Exploratory Data Analysis
# on
# Global Terrorism Database

Submitted By,
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Rohan Jagadale.
Vikas Chaudhary.
Vivek CP.

# Flow of the Presentation

**AI**

Introduction → Database Prepping → Globe at a Glance → South Asia at a Glance → India at a Glance → Standalone analysis.

- Success of Terrorism
- Actions of Major Groups
- Heat Maps

# Introduction

**AI**

**Terrorism:**
- The threatened or actual use of illegal force and violence by a non-state actor to attain a political, economic, religious or social goal through fear, coercion or intimidation

**Problem Statement:**
- To Perform EDA on Global Terrorism Database to arrive at meaningful Insights and Patterns to understand the problem of terrorism in a better way.
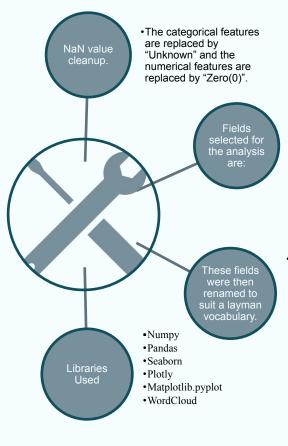
**Methodology:**
- Exploratory Data Analysis.

**Database:**
- Global Terrorism Database
- Since 1970 up until 2017.
- National Consortium for the Study of Terrorism and Responses to Terrorism (START)
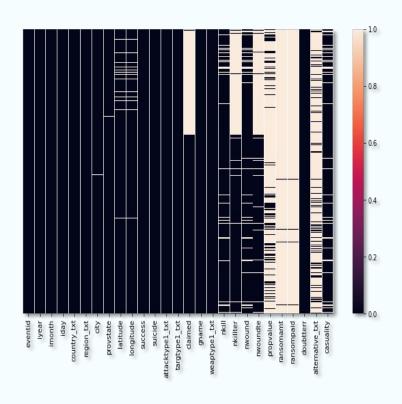- 180000+ rows x 135 columns.

# Database Prepping

**AI**

NaN value cleanup.

- The categorical features are replaced by "Unknown" and the numerical features are replaced by "Zero(0)".

Fields selected for the analysis are:

- 'eventid','iyear','imonth','iday','country_txt','region_txt', 'city','provstate','latitude','longitude','success','suicide','attacktype1_txt','targtype1_txt','claimed','motive','gname','weaptype1_txt','nkill','nkillter','nwound','nwoundte','property','propvalue','ransomamt','ransompaid','doubtterr','alternative_txt'

These fields were then renamed to suit a layman vocabulary.

- 'year','month','day','country','region','state','attack_type','target_type','organisation','weapon_type','perpetrator_wounded',ransom_amount','ransom_paid',perpetrator_killed','doubt_terror'

Libraries Used

- Numpy
- Pandas
- Seaborn
- Plotly
- Matplotlib.pyplot
- WordCloud

# Globe at a Glance

# Organization Word Cloud

wordcloud of organisations dominant over the globe

Taliban

Manuel Rodriguez Patriotic Front (FPMR)

National Liberation Army of Colombia (ELN)

Nicaraguan Democratic Force (FDN)

New People's Army (NPA)

Communist Party of India - Maoist (CPI-Maoist)

Farabundo Marti National Liberation Front (FMLN)

Revolutionary Armed Forces of Colombia (FARC)

Sikh Extremists

Abu Sayyaf Group (ASG)

Donetsk People's Republic Al-Qaida in the Arabian Peninsula (AQAP)

Islamic State of Iraq and the Levant (ISIL)

Tehrik-i-Taliban Pakistan (TTP)

Liberation Tigers of Tamil Eelam (LTTE)

Irish Republican Army (IRA)

Corsican National Liberation Front (FLNC)

African National Congress (South Africa)

Palestinian extremists

Houthi extremists (Ansar Allah)

Al-Qaida in Iraq

Al-Shabaab

Palestinians Separatists

Unknown

Houthi extremists

Boko Haram

Basque Fatherland and Freedom (ETA)

Sinai Province of the Islamic State

Shining Path (SL)

Kurdistan Workers' Party (PKK)

M-19 (Movement of April 19)

Maoists

Muslim extremists

People's Liberation Front (JVP)

Tupac Amaru Revolutionary Movement (MRTA)

# Globe at a Glance

**Global Attacks:**
- 180000+

**highest death in last decade**
- 2014: 44490

**lowest death in last decade**
- 2010: 7827

**Total deaths in last decade**
- 229756

**Most affected country**
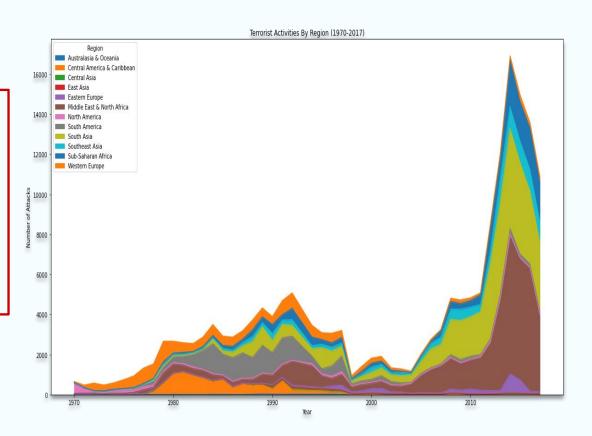- Iraq

**Group with highest attack frequency.**
- Taliban

# Terrorist activities by region

- From 1970 to 2017, the Middle East and North Africa (MENA) suffered the most from the terrorist attacks.

- 65% deaths occurred in the Middle East & North Africa, South Asia, South America, Sub-Saharan Africa.
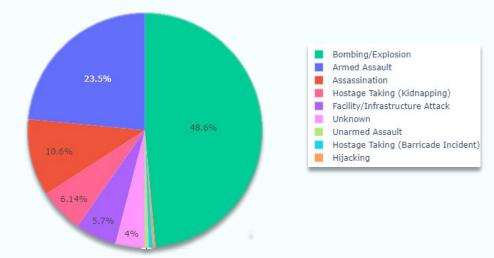


Terrorist Activities By Region (1970-2017)

# Attack Types

**AI**

- Bombing/Explosion and Armed Assault attacks are most common with over 70% of all the incidents.



48.6%

23.5%

10.6%

6.14%

5.7%

4%

Legend:
- Bombing/Explosion
- Armed Assault
- Assassination
- Hostage Taking (Kidnapping)
- Facility/Infrastructure Attack
- Unknown
- Unarmed Assault
- Hostage Taking (Barricade Incident)
- Hijacking
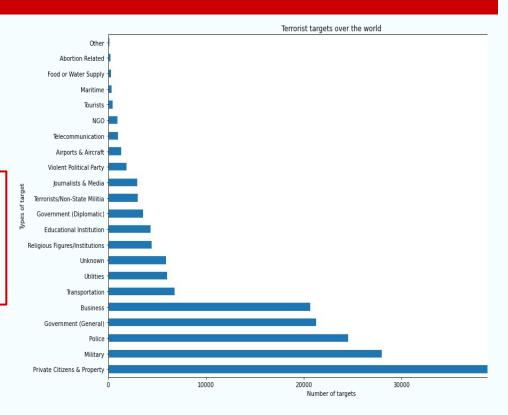
# Target Types

- Private Citizens and Properties: 43511
- The military :27984
- Police: 24506



Terrorist targets over the world

# South Asia at a Glance

# Organization Word Cloud

**AI**

wordclouds of organisations dominant over South Asia
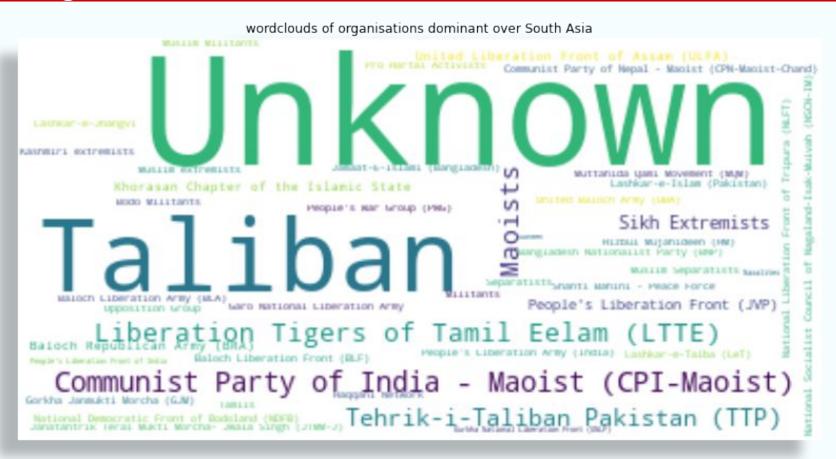
# Terrorism in South Asia

2nd most affected region.

Accounts for 44974 out of total 181691(~25%) attacks

101319 Deaths and 141360 wounded (victims and perpetrators).

Pakistan: highest number of attacks.

Afghanistan: highest number of deaths.

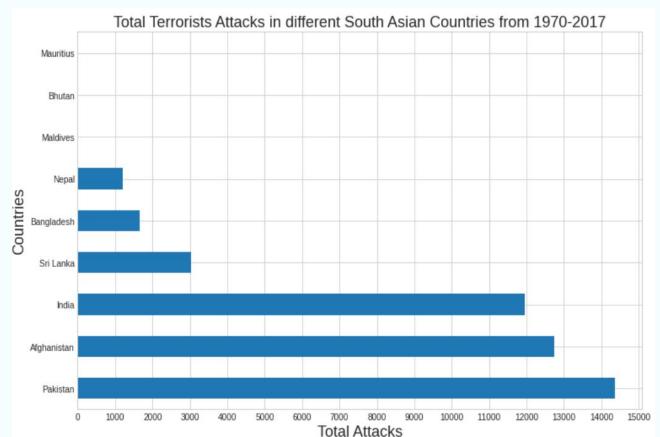2014: region recorded the highest number of attacks (4998).

32890 (~73%) attacks took place from 2008-2017.

The region is showing some respite in number of attacks after reaching at its peak in 2014. But the numbers are still high.

| | Middle_East_and_North_Africa_Attacks | South_Asia_Attacks | South_America_Attacks |
|---|---|---|---|
| 1970 | 28 | 1 | 65 |
| 1971 | 55 | 0 | 24 |
| 1972 | 53 | 1 | 33 |
| 1973 | 19 | 1 | 83 |
| 1974 | 42 | 2 | 81 |
| 1975 | 44 | 4 | 55 |
| 1976 | 55 | 4 | 91 |
| 1977 | 211 | 2 | 119 |
| 1978 | 128 | 2 | 222 |
| 1979 | 455 | 34 | 236 |
| 1984 | 268 | 244 | 1492 |
| 1995 | 590 | 1051 | 255 |
| 2008 | 1536 | 1759 | 144 |
| 2009 | 1361 | 1945 | 159 |
| 2010 | 1463 | 1981 | 148 |
| 2011 | 1663 | 2138 | 106 |
| 2012 | 2409 | 3803 | 133 |
| 2013 | 4560 | 4612 | 182 |
| 2014 | 6939 | 4998 | 283 |
| 2015 | 6036 | 4585 | 176 |
| 2016 | 6115 | 3639 | 159 |
| 2017 | 3780 | 3430 | 172 |

# South Asian Countries

Total Terrorists Attacks in different South Asian Countries from 1970-2017



**Attacks in South Asian Countries from 1970-2017:**

| | |
|---|---|
| Pakistan | 14368 |
| Afghanistan | 12731 |
| India | 11960 |
| Sri Lanka | 3022 |
| Bangladesh | 1648 |
| Nepal | 1215 |
| Maldives | 22 |
| Bhutan | 6 |
| Mauritius | 2 |

**Top-5 Terrorist organization in South Asia with number of Attacks from 1970-2017:**

| | |
|---|---|
| Taliban | 7477 |
| Communist Party of India - Maoist (CPI-Maoist) | 1878 |
| Maoists | 1625 |
| Liberation Tigers of Tamil Eelam (LTTE) | 1604 |
| Tehrik-i-Taliban Pakistan (TTP) | 1350 |

# India at a Glance

# Organization Word Cloud

**AI**



wordclouds of organisations dominant over India
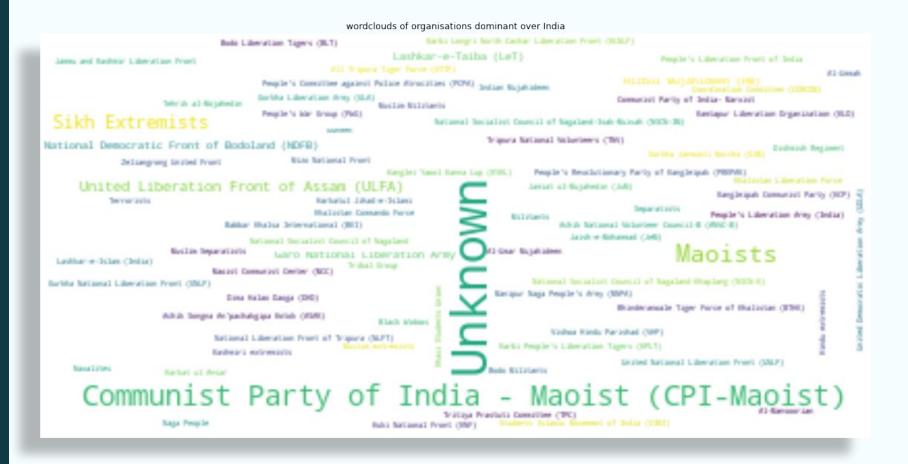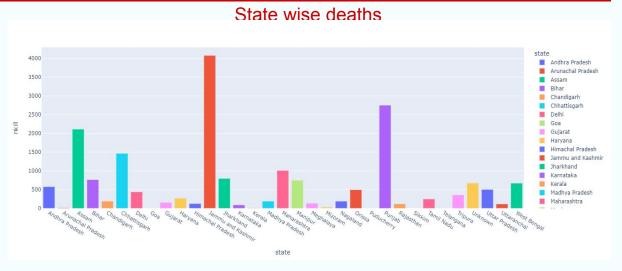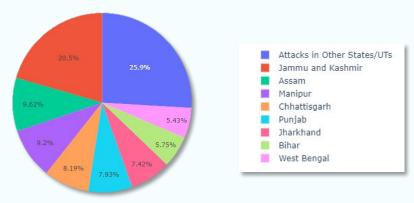
# Terrorist attacks in India

**AI**

## State wise deaths



- **11960 + attacks since 1970**
- **48321 casualties.**
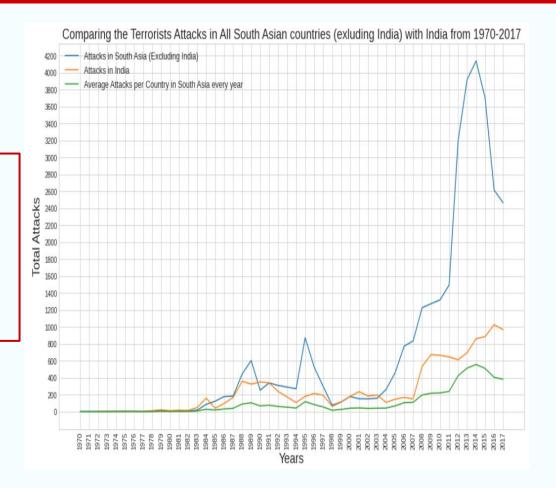- **Jammu and Kashmir, Punjab and Assam accounts for major portion.**

## State contribution to total attack count

# India Vs Rest of South Asia

- Comparison with South Asian avg.
- 1972, 1979-84, 1990-91, 2000-2003: Years when India had more attacks than rest of the South Asia combined.



Comparing the Terrorists Attacks in All South Asian countries (exluding India) with India from 1970-2017

# India Vs Pakistan Vs Afghanistan

**AI**

## India:
- 1978: Marks the rise of terrorism in India.
- 1979 – 1992 , 1996 and 1998 -2004 : India faced higher number of attacks in this group.
- 2016: India crosses the mark of 1000 attacks

## Afghanistan:
- 1970 to 2001: Low Activity.
- 2005 onwards: Started gaining traction.
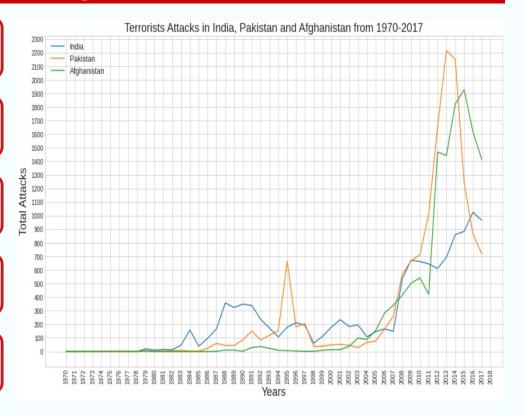- 2015: Number of attacks peaked.

## Pakistan:
- 1983: Marks the rise after recording double digit attacks.
- 1995 and 2010-15: High activity period.
- 2013: Crosses 2000 mark.

## First attack and peak:
- Pakistan: 1970- 1 attack.
- India: 1971- 1 attack.
- Afghanistan: 1972- 1 attack.
- The combined number of attacks peaked in 2014: 4835
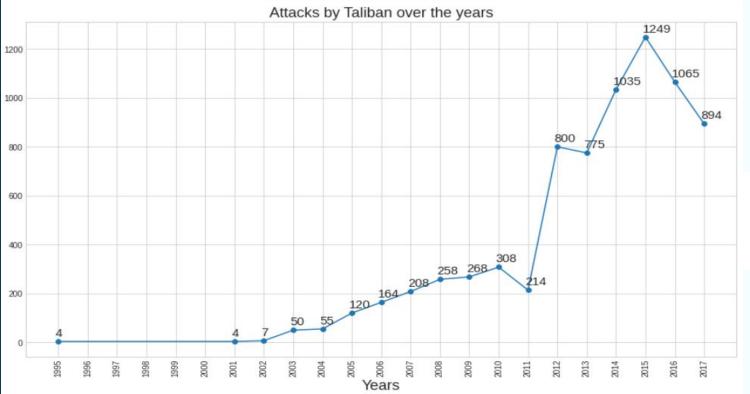
## Pattern of terrorism
- More or less a similar pattern of attacks is observed across all 3 countries.

### Terrorists Attacks in India, Pakistan and Afghanistan from 1970-2017



Legend: India, Pakistan, Afghanistan

Y-axis: Total Attacks
X-axis: Years

# Taliban 1.0 and Fate of Afghanistan

### Attacks by Taliban over the years



**Taliban's attacks in different countries (Geography of Attacks):**

| | |
|---|---|
| Afghanistan | 7423 |
| Pakistan | 54 |
| Turkmenistan | 1 |

**Table on the Right showing top-5 organization involved in Terrorist Activities in Afghanistan:**

| | |
|---|---|
| Taliban | 7423 |
| Unknown | 4806 |
| Khorasan Chapter of the Islamic State | 242 |
| Haqqani Network | 84 |
| Hizb-I-Islami | 42 |

# Taliban 1.0: Key Findings

**AI**

With 7478 attacks, accounting for 29410 death (including perpetrators), Taliban is the most ferocious organization globally in terms of number of attacks.

Khorasan Chapter of the Islamic State (or ISIS-K): Second to Taliban.

Restricted mostly to Afghanistan(99.2%)

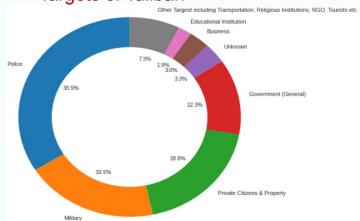Pakistan : 2nd most attacked country by Taliban.

No attacks in India credited to Taliban

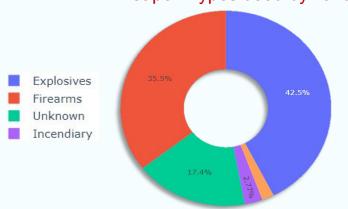53.4% of attacks targeted at Police (33.9%) and Military (19.5%).

Preferred attack type:

Explosive (42.5%) and Firearms (35.5%).

## Targets of Taliban



- Other Target including Transportation, Religious Institutions, NGO, Tourists etc
- Educational Institution
- Business
- Unknown
- Police — 33.9%
- 7.3%
- 1.9%
- 3.0%
- 3.3%
- Government (General)
- 12.3%
- 18.8%
- 19.5%
- Military
- Private Citizens & Property

## Weapon Types used by Taliban



- Explosives — 42.5%
- Firearms — 35.5%
- Unknown — 17.4%
- Incendiary — 2.77%

# Success of Terrorism: Success Parameters

The target of the assassination must be killed.

The assault takes place and if a target is hit (including people and/or property).

If the bomb or explosive device detonates.

If the hijackers assume control of the vehicle at any point.

If the hostage takers assume control of the individuals at any point.

If the kidnappers assume control of the individuals at any point.
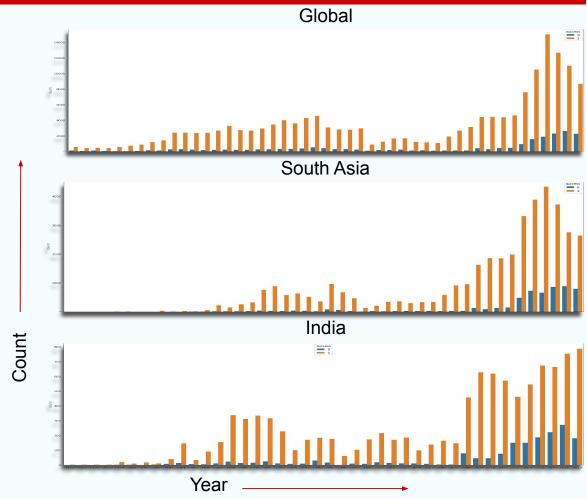
If the facility is damaged.

If there is a victim who has been injured.

Source: GTD Codebook: https://www.start.umd.edu/gtd/downloads/Codebook.pdf

# Successful Vs Unsuccessful

**AI**

- Successful attacks have been on a gradual increase over the time.

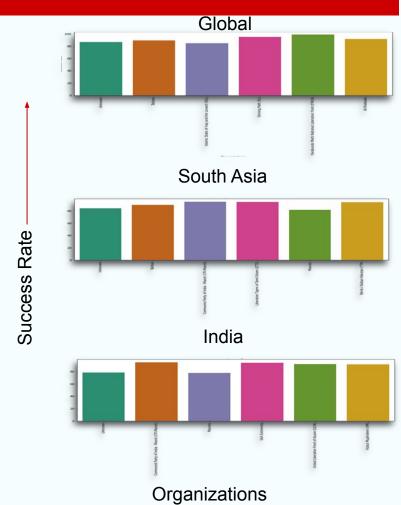- But the unsuccessful attacks has not been able to keep up.



Global

South Asia

India

Count

Year

# Org Success Rate



| organisation | success | attacks | succes_rate_percentage |
|---|---|---|---|
| Unknown | 71748 | 82782 | 86.67 |
| Taliban | 6680 | 7478 | 89.33 |
| Islamic State of Iraq and the Levant (ISIL) | 4759 | 5613 | 84.79 |
| Shining Path (SL) | 4337 | 4555 | 95.21 |
| Farabundo Marti National Liberation Front (FMLN) | 3317 | 3351 | 98.99 |
| Al-Shabaab | 3016 | 3288 | 91.73 |

| organisation | success | attacks | succes_rate_percentage |
|---|---|---|---|
| Unknown | 18385 | 21913 | 83.9 |
| Taliban | 6679 | 7477 | 89.33 |
| Communist Party of India - Maoist (CPI-Maoist) | 1774 | 1878 | 94.46 |
| Liberation Tigers of Tamil Eelam (LTTE) | 1529 | 1625 | 94.09 |
| Maoists | 1304 | 1604 | 81.3 |
| Tehrik-i-Taliban Pakistan (TTP) | 1267 | 1350 | 93.85 |

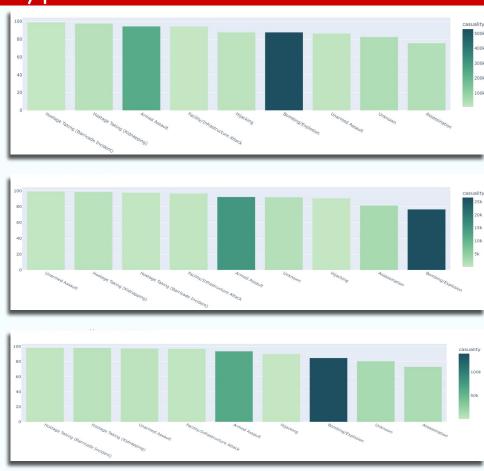| organisation | success | attacks | succes_rate_percentage |
|---|---|---|---|
| Unknown | 3337 | 4263 | 78.28 |
| Communist Party of India - Maoist (CPI-Maoist) | 1773 | 1877 | 94.46 |
| Maoists | 1083 | 1396 | 77.58 |
| Sikh Extremists | 667 | 710 | 93.94 |
| United Liberation Front of Assam (ULFA) | 327 | 357 | 91.6 |
| Hizbul Mujahideen (HM) | 182 | 199 | 91.46 |

Global

South Asia

India

Success Rate

Organizations

# Success Rate of Attack Types



- Hostage Taking: most successful, low casualties.
- Bombing and explosion: most casualties, yet low success rate.

Success Rate (Percentage)

Attack Types

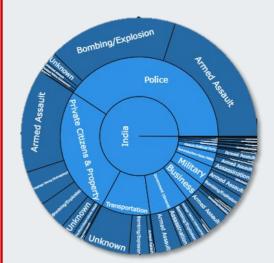# Actions of Major Groups

Sunburst Charts

**Taliban**:
- Afghanistan(57140), Pakistan (197), Turkmenistan (5).
- Bombing/Explosions (24650), Armed Assaults (18901), unknown attack types(7149).00
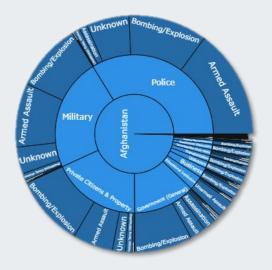- Police, Military, Private Citizens and Properties, and government(general).

**CPI (Maoists):**
- India(4007), Nepal(2)
- Armed Assaults(1848), Bombing/Explosions (1164),unknown attack types(437)
- Police, followed by Private Citizens and Properties, Transportation and Government

CPI(Maoists)

Taliban

**Muslim Extremists:**
- Countries caused casualties in : 51
- Country caused most casualties in: Syria; 600 casualties
- Preferred Attack type: Bombing Explosions
- Preferred Target Type: Private citizens/ Properties, Military, Educational Institutes.

**Gunmen:**
- Countries caused casualties in : 50
  Country caused most casualties in: India; 113 casualties
- Preferred Attack type: Bombing Explosions
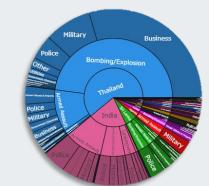- Preferred Target types: Religious figures/Institutes, Government, Journalists/Media.

**Separatists:**
- Countries caused casualties in : 30
- Country caused most casualties in: Thailand; 1256 Casualties
- Preferred Attack type: Bombing Explosions
- Preferred Target type: Business, Military, Police


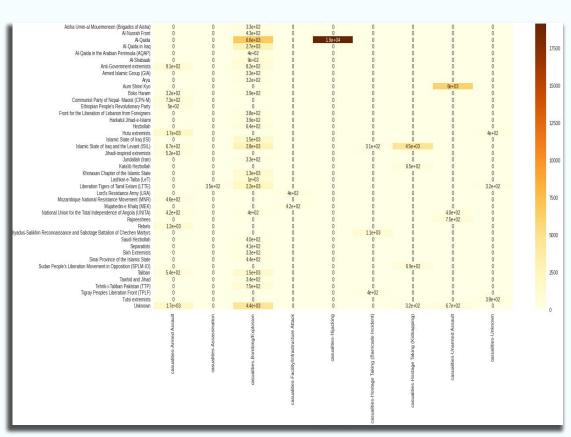
Muslim Extremists



Separatists



Gunmen

# Attack Type Vs Organizations: Heatmap

- Armed Assaults and Bombing/Explosions: most sought after attack types
- Focused on developing an expertise with certain attack types.
- Al quaeda : 19000 casualties using hijacking



Organizations (y-axis)

Attack Types (x-axis)

# Conclusion

**AI**

## Globe at a Glance:
- Active organizations
- Global statistics
- Region wise breakdown
- Attack types
- Target types

## South Asia at a Glance
- Active organizations
- Regional statistics
- Most affected countries

## India at a Glance
- Active organizations
- National statistics
- India Vs rest of South Asia
- India Vs Afghanistan Vs Pakistan

## Taliban:
- Active regions of Taliban
- Attack and casualty statistics

## Success of Terrorism: How well are we waging against it?
- Success parameters
- Successful Vs unsuccessful attacks
- Success rate of organizations
- Success rate of attack types.

## Activities of Major Groups
- Insight into Taliban and CPI(Maoists)
- Organizations that has covered the most ground
- Heat map of organizations and attack types

# Thank You