**Global Terrorism Analysis**

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**Index :**

| **Abstract** |
| --- |
| **1. Introduction** |
| **2. Problem Statement** |
| **3. Approach for Analysis** |
| **4. Exploratory Data Analysis**   * **Data Cleaning**   + **Understanding the Data Set**   + **Dropping Unnecessary Columns** * **Numeric representation of textual data columns** * **Columns unnecessary to our analysis**   + **Defining the columns that we worked on** * **Data Manipulation**    + **Handling Null Values**   + **Adding New Column** |
| **5. Data visualization**   * **Univariate Charts** * **Bivariate Charts** * **Multivariate Charts** |
| **6. Challenges** |
| **7. Conclusion**   * **Inferences** * **Possible Steps to Tackle Terrorism** |

**Abstract:**

Terrorism is one of the biggest global challenges faced by humanity, killing and wounding millions of people, and responsible for the long-term destruction of wealth opportunities and the well-being of people.

Our EDA is an attempt to dig deep into data to find out the possible ways to prevent terror attacks, initiatives that can be taken for the short and long term for tackling global terrorism, and changing trends in terror attacks to effectively plan for the future.

***Keywords: EDA (exploratory data analysis)***

**1. Introduction:**

### 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.

The dataset contains data for 181691 attacks that took place over a span of 47 years with 135 columns describing the losses and other variables in those attacks such as attack type, target type, the weapon used, the number of people killed, etc.

The main objective of this analysis is to get a complete insight into the data and understand trends to take effective measures to tackle global terrorism.

**2. Problem Statement:**

The main question that the analysis is intended to understand trends in global terrorism.

To get the answer we have analyzed the following questions:

Which countries were most attacked?

Which regions were affected the most?

Is there an increase or decrease in recent years?

Is there an increase or decrease in the number of successful terror operations?

Who are the most targeted globally and regionally?

What are the most common types of attacks globally and regionally?

What are the most used weapon types globally and regionally?

Which terrorist organization is responsible for the majority number of attacks?

By analyzing these questions, the end goal is to come up with short-term and long-term solutions to stop and tackle terrorism.

## **3. Approach for Analysis:**

The approach that was adopted to get insights was a top-down approach which mainly consists of the following:

* Global Terror Analysis
  + Year-wise terrorist attacks analysis
  + 2014(peak year) Terror attacks analysis
  + Changes in Terrorist organizations and their target types before and after reaching the peak in the number of attacks.
  + Success to Failure Ratio.
* Attack Type, Target Type, and Weapons Used in Terror Attacks the Most
* Regional Terrorism Analysis
  + Most Affected Regions
* Country, State/Province, City level analysis.
* Terrorist Organization Analysis

## **4. Exploratory Data Analysis:**

## **4.1. Data Cleaning:**

For the data analysis we used the python libraries like Numpy, Pandas, Matplotlib, Seaborn, and Plotly.

1. **Understanding the Data Set:**

All Columns with more than 15% of their entire data if they are null values, they were dropped.

1. **Dropping Unnecessary Columns:**

A few other columns that were deemed not necessary for analysis were also dropped which satisfied the above criteria.

1. **Numeric representation of textual data columns:**

The columns with the completely numeric representation of textual data available in other columns representing the same fact/data were dropped. The dropped columns are as follows

country, region, attacktype1, targtype1, targsubtype1,weaptype1, weapsubtype1, natlty1.

1. **Columns unnecessary to our analysis:**

The columns deemed unnecessary for our analysis were dropped.

guncertain1, individual, dbsource, INT\_LOG, INT\_IDEO, INT\_MISC, INT\_ANY, specificity, vicinity, crit1, crit2, crit3, eventid, property, weapsubtype1\_txt, targsubtype1\_txt, doubter, iday, eventid, extended, target1.

1. **Defining the columns that we worked on:**

iyear = Year of Attack

imonth = Month of Attack

country\_txt = Name of the Country Attacked

region\_txt = Name of the Region Attacked

provstate = Name of Province/State that was Attacked

city = Name of the City that was targeted

latitude = Latitude Coordinate of the Attack

longitude = longitude Coordinate of the Attack

Success = binary data of success/failure

attacktype1\_txt = type of attack carried out. example : Hostage-taking,bombing, etc.

targtype1\_txt: Type of Target aimed for.

natlty1\_txt : nationality of the target victim.

gname : Terrorist Organization Name.

weaptype1\_txt : Weapon Type used for terror attacks. example : explosives, assault weapons, etc.

nkill : Number of people killed in the attack.

nwound : Number of people wounded in the attack.

ishostkid : binary data of a child

taken hostage in a terror attack.

## **4.2. Data Manipulation**

1. **Handling Null Values:**

Null values in the columns city, provstate, and natlty1\_txt have been filled/replaced with ‘Unknown’.

Null values in the columns nkill, nwound, and ishostkid have been filled/replaced by the value ‘0’.

Null values in the column targettype1\_txt have been replaced with ‘Others’.

1. **Adding New Column:**

total\_victims = nkill + nwound

Total Victims = Number of People Killed + Number of People Wounded in a Terror Attack

**5. Data Visualization:-**

The representation of information in the form of graphs, charts, pictures, etc.

It helps us to easily understand the data and identify the patterns. It is also more attractive and user-engaged.

1. Univariate Analysis Charts:
   1. Line Chart
   2. Bar Chart
   3. Pie Chart
2. Bivariate Analysis Charts:
   1. Area Charts
   2. Line Charts
   3. Bar Charts
3. Multivariate Analysis Charts:
   1. Sunburst Charts
   2. Tree Map Charts

# **6. Challenges:**

1. Encoding the data from UTF-8 to ISO-8859-1.
2. Finding correlation using a combination of different columns.
3. Dropping Columns with Null Values.
4. Dropping the Duplicate Columns.
5. Personally Checking the validation of each column.

# **7. Conclusion**

**7.1 Inferences:**

1. Terrorist attacks reached a peak in 2014 and then in 2015 started to drop. The Drop in the Number of Terror Attacks is not a sign of significant improvement in security checks as the ability to carry out a successful terror attack has not drastically reduced.
2. If the last 6 years were to be compared i.e. from 2012-2017 with the entire timeline we see an extreme rise in the number of attacks. Necessary action needs to be taken before terrorism poses an insurmountable challenge.
3. The Middle East & North Africa is the most affected region in terms of the number of terror attacks among all the regions followed by South Asia, South America, and Sub-Saharan Africa.
4. Iraq is the most affected nation of all and it has suffered the highest number of attacks followed by Pakistan, Afghanistan, and India.
5. Most attacks were bombings or Explosions followed by firearms.
6. Most commonly used weapons in terror attacks are Explosives and assault weapons.
7. Most Attacks are targeted toward Private Citizens & Property, Military, Police, and Government.
8. The Target Types suggest the attacks might be carried out to induce fear and pass on a message to the society by spreading chaos among citizens and reducing morale and confidence in security agencies thereby challenging the legitimacy of the governments.
9. Before 2014 we see a majority of claimed attacks were carried out by insurgency organizations but after 2014 we see 7 out of 10 terror groups are Radical Islamic Terror Organizations suggesting a greater concern towards radicalization.
10. Majority of Terror Attacks are not claimed by any terrorist organization.
11. Taliban and ISIL are the most active Organizations in the world.
12. Afghanistan has been attacked and suffered the most because of the Taliban.
13. ISIL is rapidly increasing its presence in Africa after the Middle East which should be a cause of concern.
14. Terror Organizations and Attacks are slowly moving to Underdeveloped and Developing Countries with large populations below the poverty level in South Asia and Africa.
15. This creates a cycle of terrorism as poverty and unemployment help radical ideologists lure youth towards terrorism, discouraging investors which in turn affects the earnings of local governments and leads to further poverty and unemployment.

**7.2 Possible Steps to Tackle Terrorism:**

1. Defining Terrorism on a global stage and adopting an International Framework to tackle terrorism
2. Creating a joint task force to improve Intelligence Sharing and sharing best practices to combat terrorists.
3. By imposing strict regulations on the access and sale of Dangerous weapons and firearms and tracing sources of such weapons.
4. Adopting a global framework and implementing a tough action plan against terror financers.
5. Education in population control and improving conditions to encourage employment opportunities might reduce terror activities in the long run.
6. Strict policies against disinformation and radicalization need to be adopted including in the media and the internet.