

Exploratory Data Analysis Report: Global Terrorism (Jan-June 2021)

1. Introduction

This report presents an Exploratory Data Analysis (EDA) of the Global Terrorism Database (GTD) focusing on incidents recorded between January and June 2021. The objective is to uncover key patterns, trends, and characteristics of terrorist activities worldwide during this period through statistical summaries and visualizations. The analysis examines the geographical distribution of attacks, temporal trends, common attack methods and targets, and the primary perpetrator groups involved.

2. Data Overview

The analysis is based on the `globalterrorismdb_2021Jan-June_1222dist.csv` dataset, which contains structured information on terrorist attacks.

- **Initial Data Structure:** The dataset comprises **4,960 rows** and **20 columns**, providing a detailed record of each incident.
- **Key Columns:** The analysis focuses on attributes such as date (`imonth`, `iday`), location (`country_txt`, `region_txt`), attack specifics (`attacktype1_txt`, `targtype1_txt`), and perpetrator information (`gname`).
- **Data Types and Missing Values:** An initial inspection revealed mixed data types (integers, floats, and objects). Several columns contained missing values, most notably `weapsubtype1` (793 missing), `targsubtype1` and `targsubtype1_txt` (183 missing each), and `natlty1` and `natlty1_txt` (60 missing each). For this exploratory analysis, these missing values are acknowledged and considered in the interpretation of the visualizations.

2.1. Descriptive Statistics

A summary of the numerical features provides a high-level quantitative overview of the dataset.

Feature	Count	Mean	Std Dev	Min	25%	50%	75%	Max
eventid	4960.0	2.02E+11	1.72E+06	2.02E+11	2.02E+11	2.02E+11	2.02E+11	2.02E+11
imonth	4960.0	3.74	1.72	1.0	2.0	4.0	5.0	6.0

id	4960.0	15.88	8.73	1.0	8.0	16.0	24.0	31.0
country	4960.0	104.89	102.17	4.0	4.0	95.0	153.0	1004.0
region	4960.0	7.99	2.57	1.0	6.0	8.0	10.0	12.0
targsub type1	4777.0	48.06	28.28	1.0	24.0	35.0	75.0	113.0
natlty1	4900.0	113.02	106.41	4.0	4.0	95.0	160.0	1004.0
weapsu btype1	4167.0	10.63	6.46	1.0	5.0	11.0	16.0	31.0

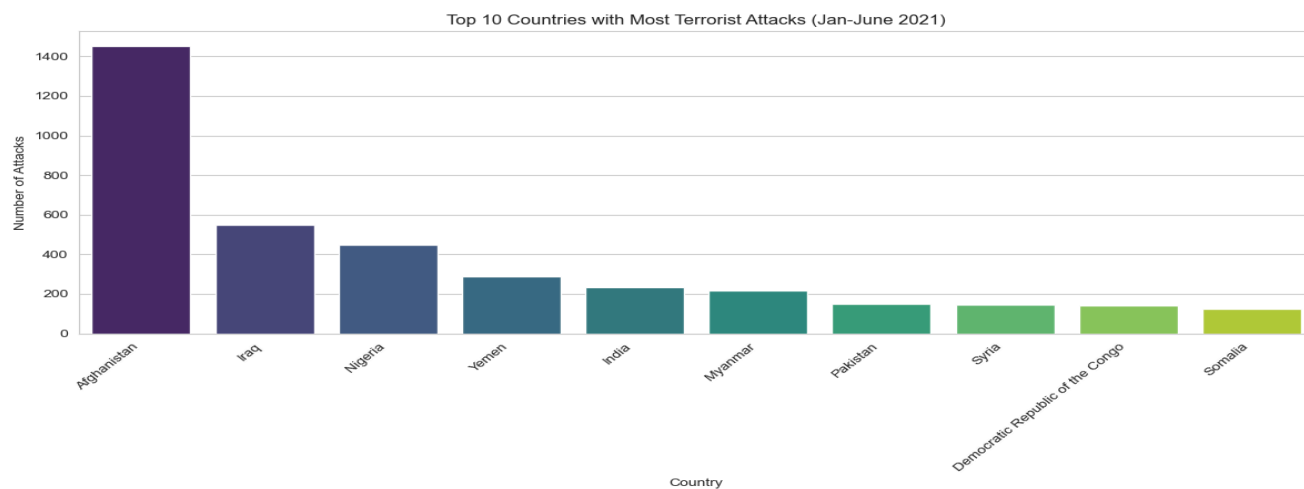
3. Analysis and Visualizations

The following sections detail the findings derived from visualizing this data.

3.1. Geographical Distribution of Attacks

Terrorist activities in the first half of 2021 were heavily concentrated in specific regions and countries.

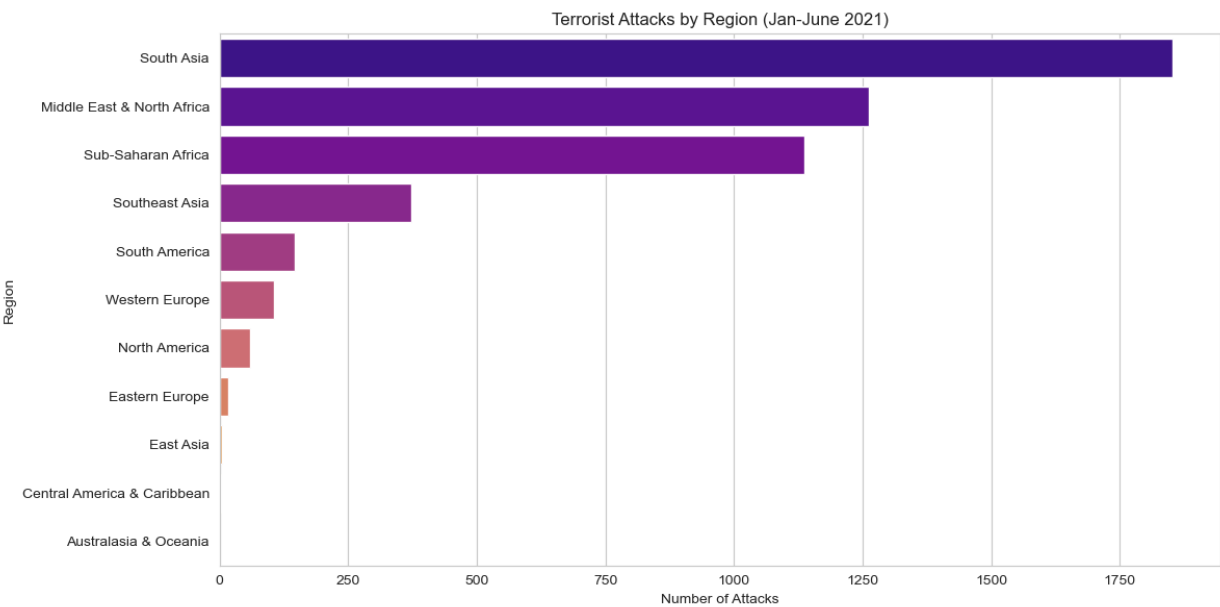
Top 10 Countries with Most Terrorist Attacks (Jan-June 2021)



Observation: Afghanistan was the most affected country, with over 1,400 attacks, significantly more than any other nation. Iraq, Nigeria, Yemen, and India followed, indicating that the impact of terrorism was most severe in South Asia, the Middle East, and Sub-Saharan Africa.

Terrorist Attacks by Region (Jan-June 2021)

- **Observation:** The regional view confirms the country-level data. South Asia recorded the highest number of incidents, followed closely by the Middle East & North Africa and Sub-Saharan Africa. Other regions like North America and Europe experienced



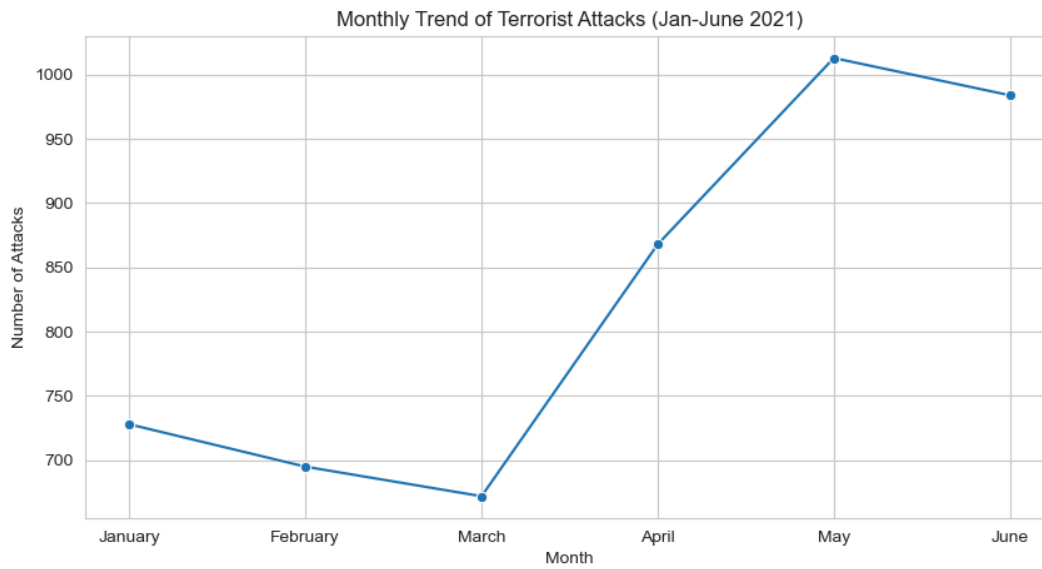
significantly fewer attacks.

3.2. Temporal Trends

The data reveals a fluctuating pattern of terrorist activity over the six-month period.

Monthly Trend of Terrorist Attacks (Jan-June 2021)

- **Observation:** After a slight decrease from January to March, there was a sharp increase in terrorist attacks, peaking in May with over 1,000 incidents. Activity saw a minor decline in June but remained high compared to the beginning of the year.

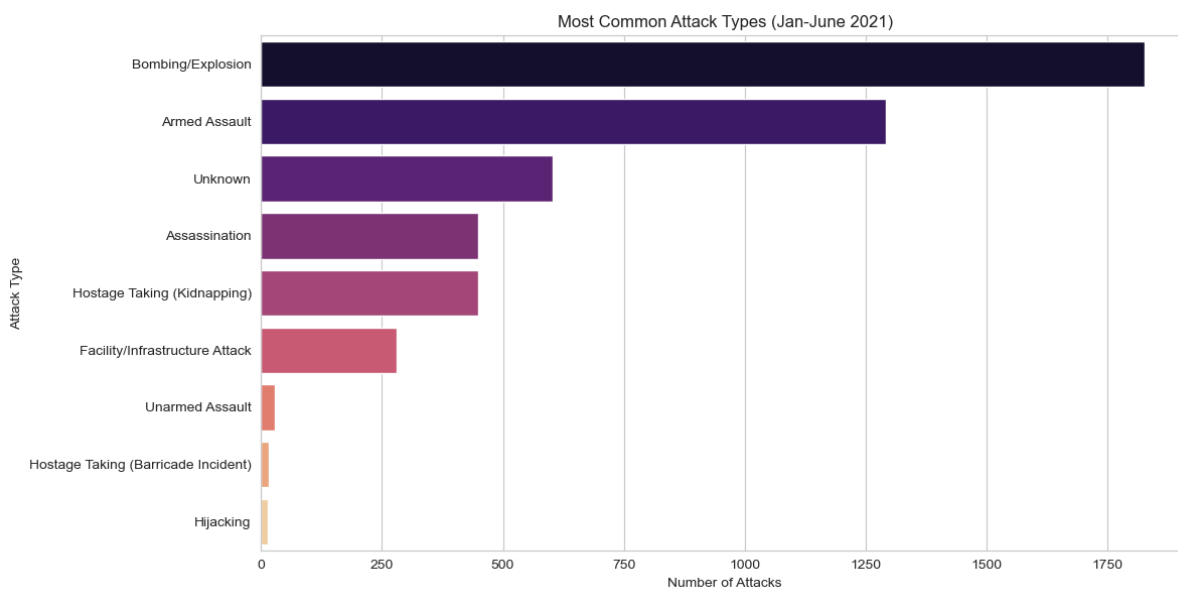


3.3. Attack Characteristics

The analysis of attack types, weapons, and targets provides insight into the tactics and objectives of terrorist groups.

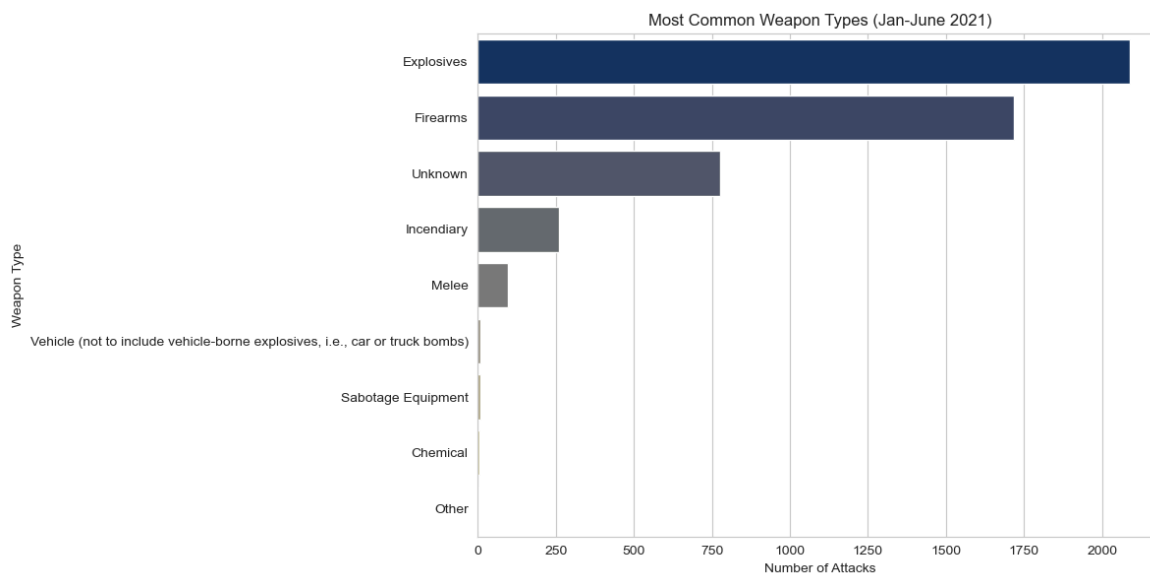
Most Common Attack Types (Jan-June 2021)

- **Observation:** Bombing/Explosion was the most common attack method by a large margin, accounting for over 1,800 incidents. Armed Assault was the second most frequent tactic.



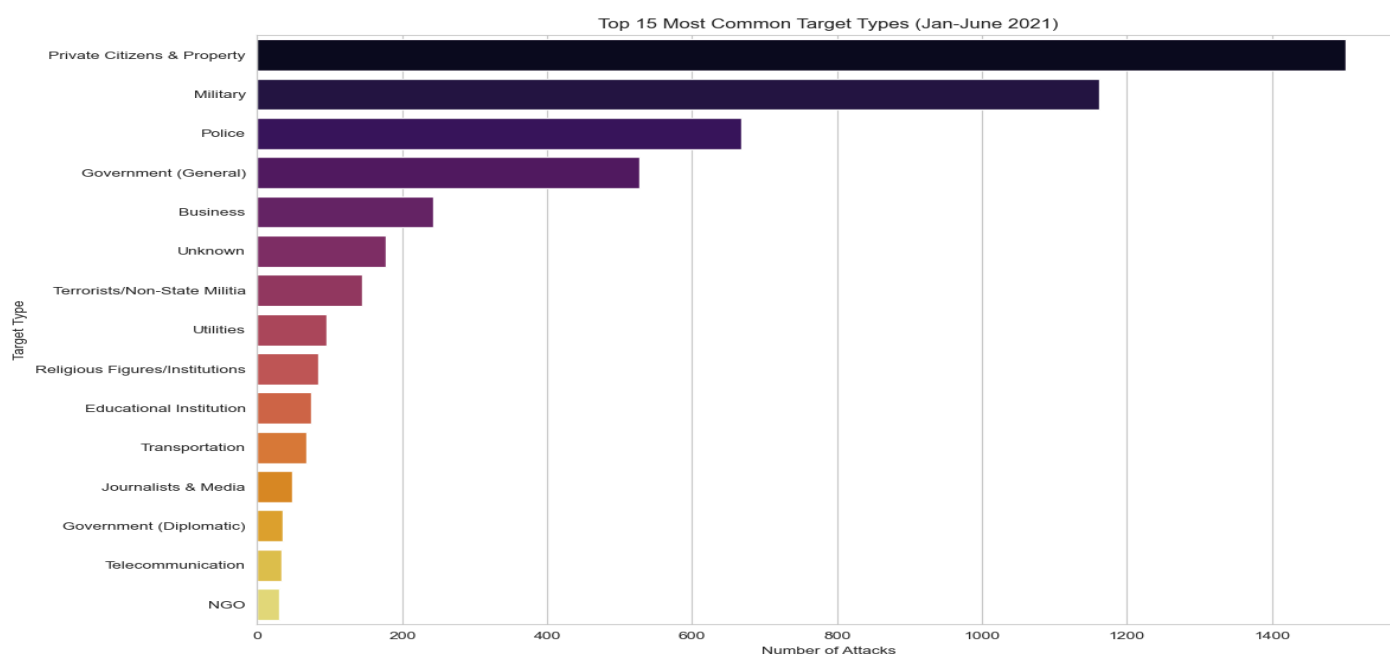
Most Common Weapon Types (Jan-June 2021)

- **Observation:** Corresponding with the most common attack type, Explosives were the most frequently used weapons. Firearms were the second most prevalent weapon type used in attacks.



Top 15 Most Common Target Types (Jan-June 2021)

- **Observation:** Private Citizens & Property were the most common targets, highlighting the significant threat to civilians. Military and Police were the next most frequent targets, indicating a focus on state security forces.

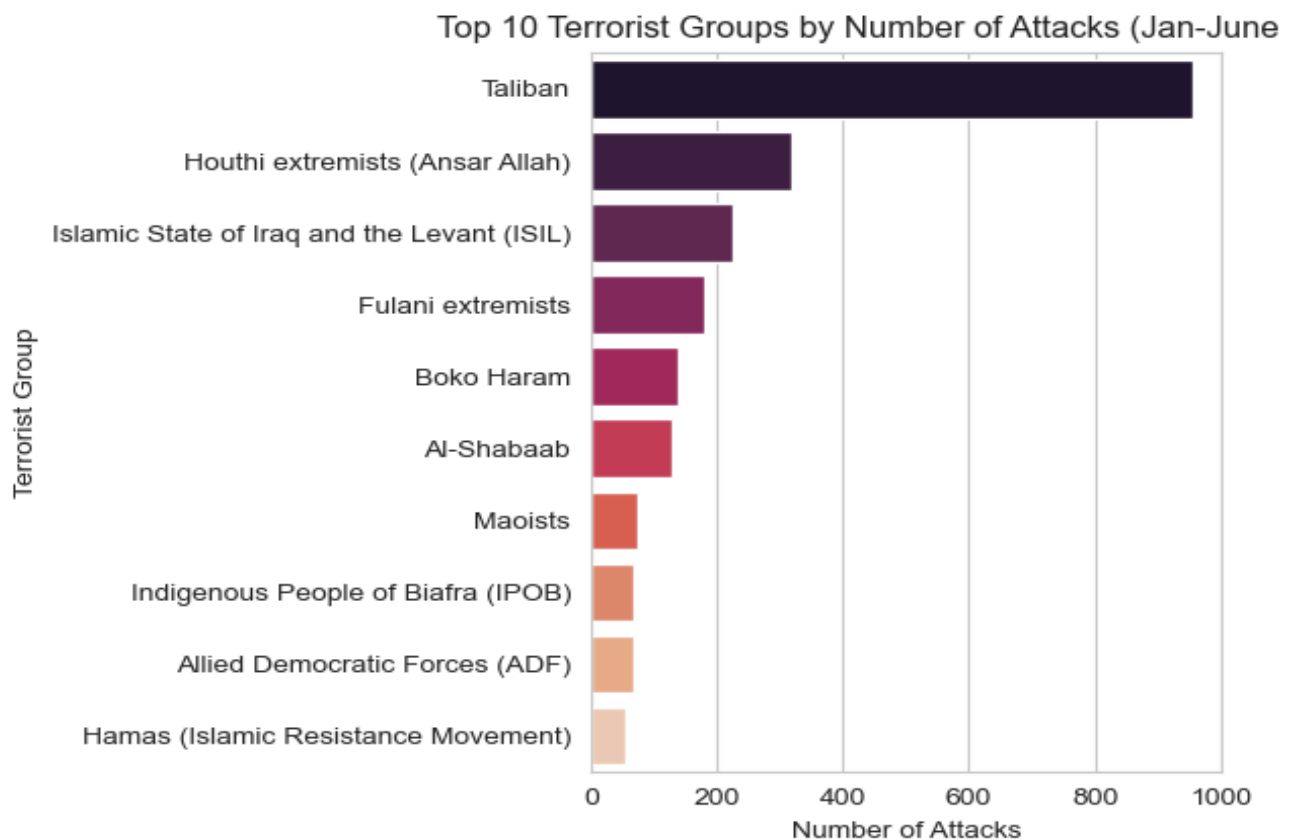


3.4. Perpetrator Group Analysis

While many attacks were carried out by unknown perpetrators, several groups were identified as highly active.

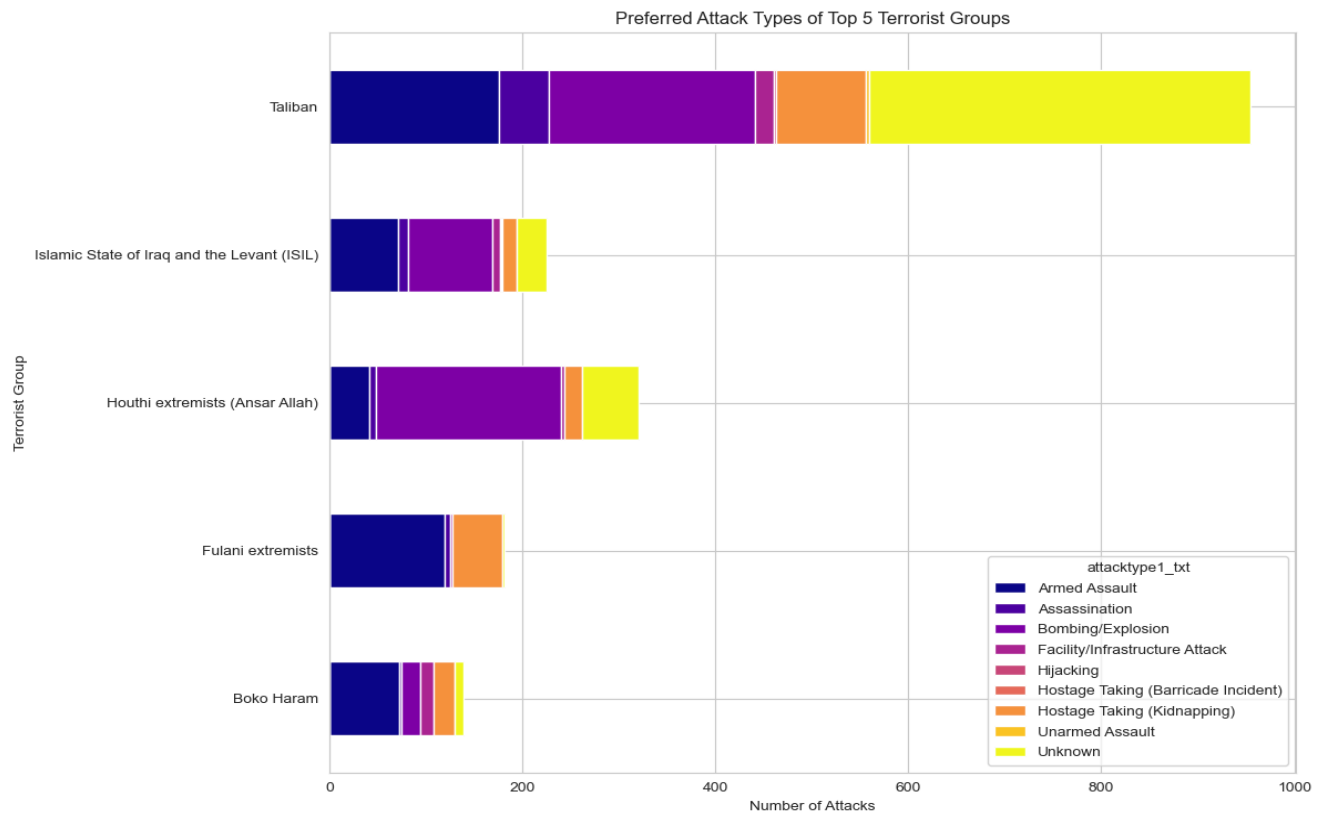
Top 10 Terrorist Groups by Number of Attacks (Jan-June 2021)

- **Observation:** The Taliban was the most active group, responsible for nearly 1,000 attacks. Houthi extremists (Ansar Allah) and the Islamic State of Iraq and the Levant (ISIL) were also highly active during this period.



Preferred Attack Types of Top 5 Terrorist Groups

- **Observation:** The top groups predominantly used Bombing/Explosion and Armed Assault tactics. The Taliban and ISIL utilized a combination of both, while groups like the Houthi extremists relied more heavily on bombings.

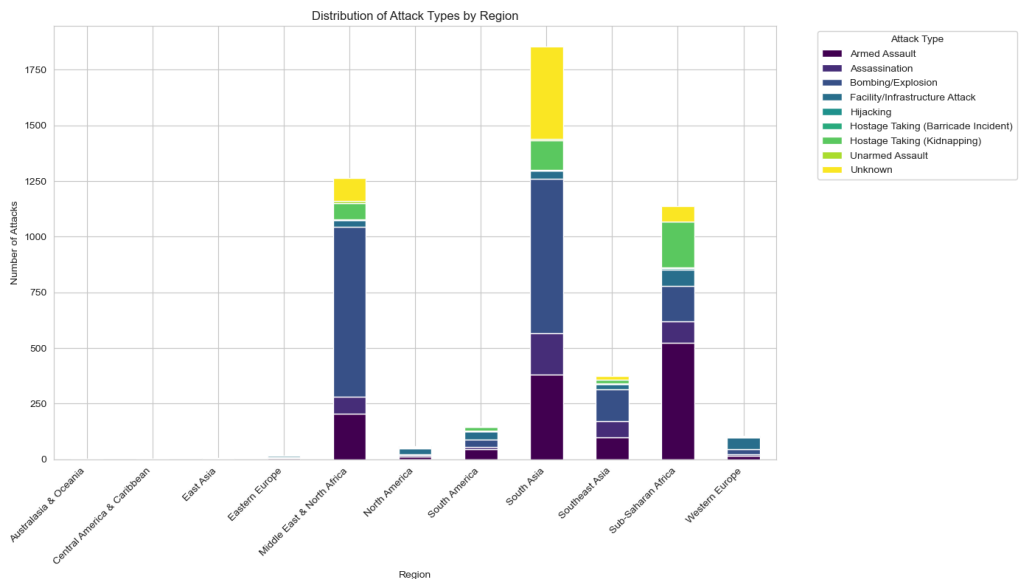


3.5. Regional Attack Patterns

A breakdown of attack types by region shows distinct tactical preferences.

Distribution of Attack Types by Region

- **Observation:** While Bombing/Explosion is the most common tactic globally, its prevalence varies. In the Middle East & North Africa and South Asia, it is the dominant method.



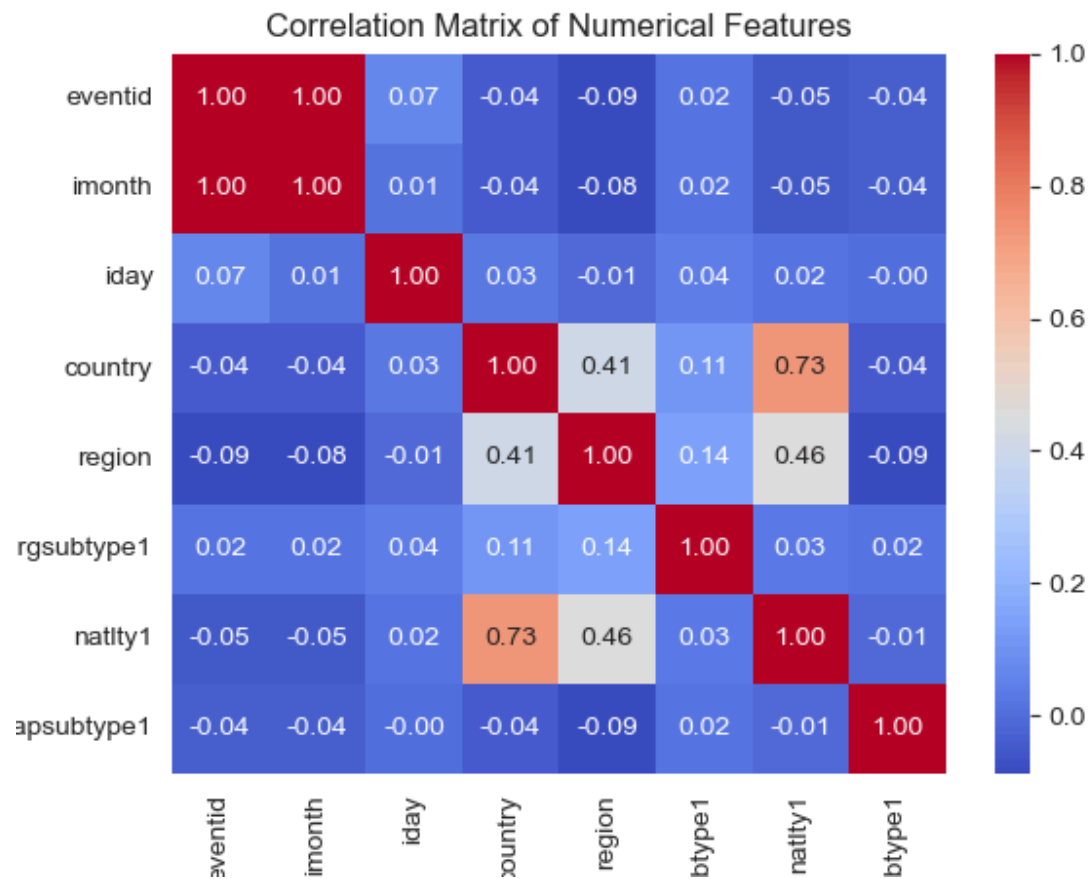
In Sub-Saharan Africa, Armed Assaults occur with almost the same frequency as bombings.

3.6. Correlation of Numerical Features

A correlation matrix was generated to identify linear relationships between the numerical variables in the dataset.

Figure 10: Correlation Matrix of Numerical Features

- **Observation:** The matrix shows very weak correlations between most numerical features. The strongest observed correlation is between the `country` ID and the target's `natlty1` (nationality ID) at 0.73, which is expected as attacks often target nationals of the country they occur in. Other correlations are not strong enough to suggest significant linear relationships.



4. Conclusion

This exploratory analysis of the Global Terrorism Database for the first half of 2021 provides several key takeaways:

- Terrorist activity was geographically concentrated, with South Asia, the Middle East, and Sub-Saharan Africa being the most affected regions. Afghanistan was the single most impacted nation.
- There was a concerning rise in attacks from March to May 2021.
- The primary tactics involved bombings and armed assaults, with civilians and state security forces being the most common targets.
- The Taliban and ISIL were identified as the most active perpetrator groups.