Global Terrorism Data Analysis

Exploratory Data Analysis Report

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Abstract

This report presents an exploratory data analysis of global terrorism incidents. The objective is to identify trends, regional patterns, attack methods, and human impact based on kills and injuries using data-driven visualizations.

1. Introduction

Terrorism is a major global security challenge that affects human lives and infrastructure. Analyzing historical terrorism data helps identify patterns and trends that support better risk assessment and policy planning.

2. Dataset Overview

The dataset used in this analysis is the Global Terrorism Database (GTD), which contains information on terrorist incidents worldwide.

- Records: Approximately 180,000 incidents
- Time Period: 1970 onwards
- Total Columns: More than 130 attributes

Only selected columns were used to reduce complexity and focus on meaningful insights. These include time, location, attack characteristics, and impact-related columns (kills and injuries).

3. Data Cleaning Process

The dataset was cleaned to ensure accuracy and consistency.

- Column names were standardized
- Missing values in kills and injuries were replaced with zero
- Missing categorical values were replaced with "Unknown"
- Invalid date values were handled

4. Overall Key Insights

- Terrorist activity increased significantly after 2010.
- After the peak period, a gradual decline in terrorist attacks is observed.
- Terrorist attacks are not evenly distributed across the world and are concentrated in specific regions.
- Middle East & North Africa is the most affected region in terms of attack frequency.
- South Asia is the second most affected region, showing long-term security challenges.
- A small number of countries such as Iraq, Afghanistan, and Pakistan account for a large share of global terrorist attacks.
- Iraq has the highest number of kills, making it the most severely impacted country.

- Some countries experience fewer attacks but report high kills, indicating higher attack severity.
- Bombing and explosion are the most commonly used attack methods.
- Armed assaults are the second most frequent and highly dangerous attack type.
- Explosives and firearms are the most commonly used weapons in terrorist attacks.
- Injuries caused by terrorist attacks are higher than kills, highlighting significant human impact beyond deaths.
- Kills and injuries show a positive correlation, meaning deadlier attacks also cause more injuries.
- Terrorist activity does not follow a strict seasonal pattern and occurs throughout the year.
- A small number of terrorist groups are responsible for a large proportion of total kills.

5. Exploratory Data Analysis

5.1. Number of Terrorist Attacks Over the Years

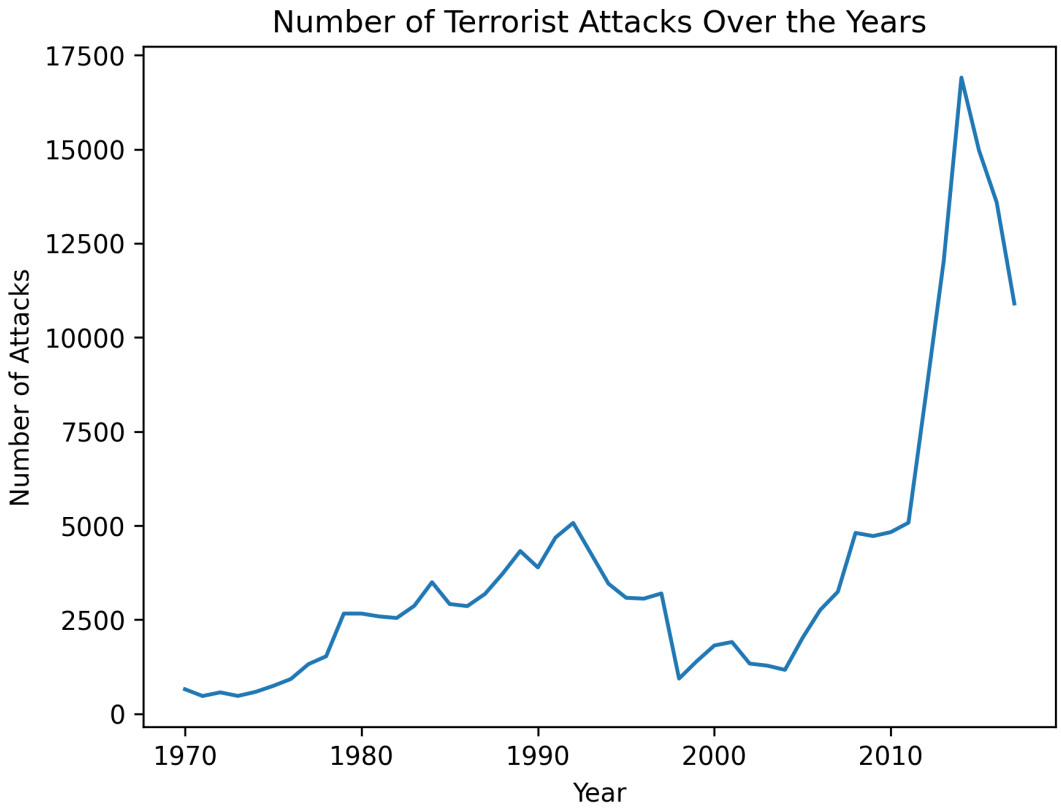

Figure 1: Number of Terrorist Attacks Over the Years

Key Findings

- Terrorist attacks increased sharply after 2010.
- After the peak period, attacks show a gradual decline.

5.2. Top 10 Countries with Most Terrorist Attacks

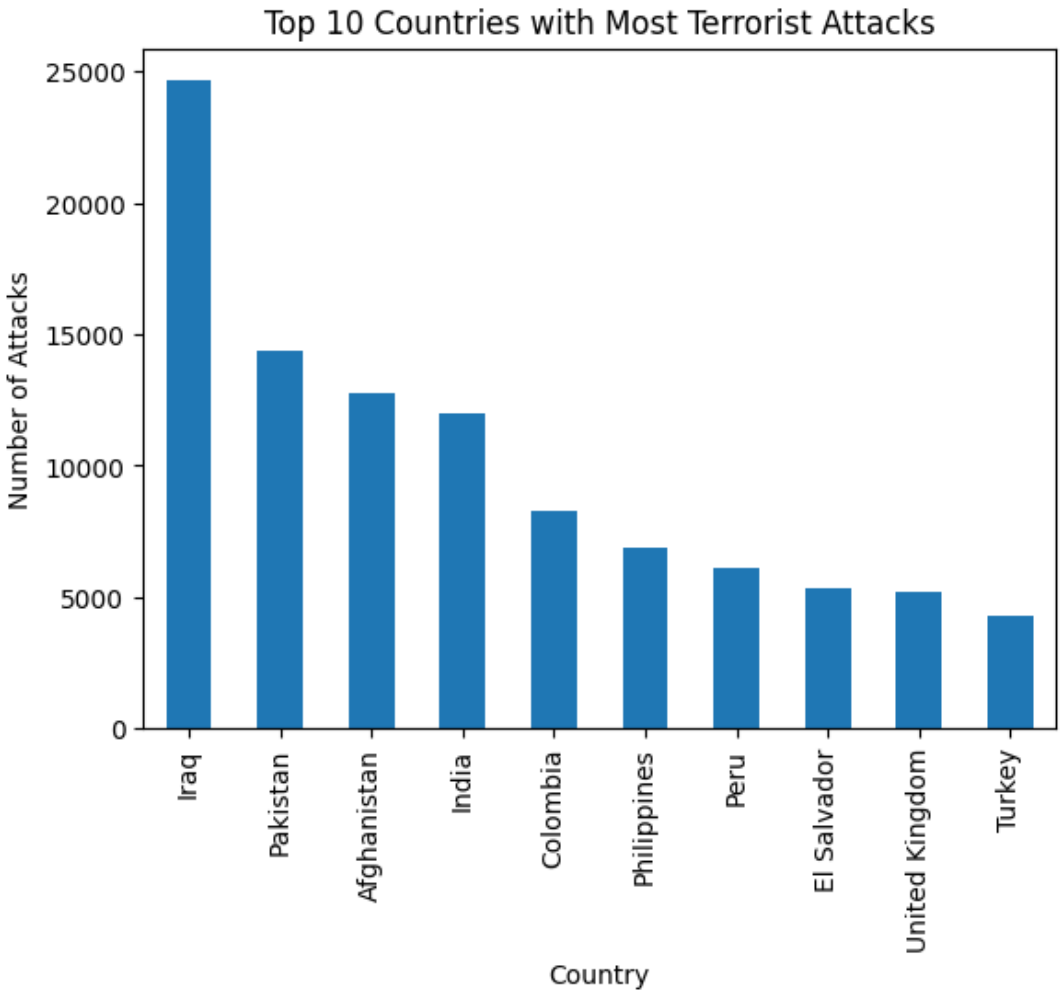

Figure 2: Top 10 Countries with Most Terrorist Attacks

Key Findings

- A small number of countries (Iraq, Pakistan, Afghanistan, etc.) account for most terrorist attacks.
- These countries face long-term security challenges.
- Attacks are not evenly distributed across the world.

5.3. Top 10 Deadliest Countries (Kills)

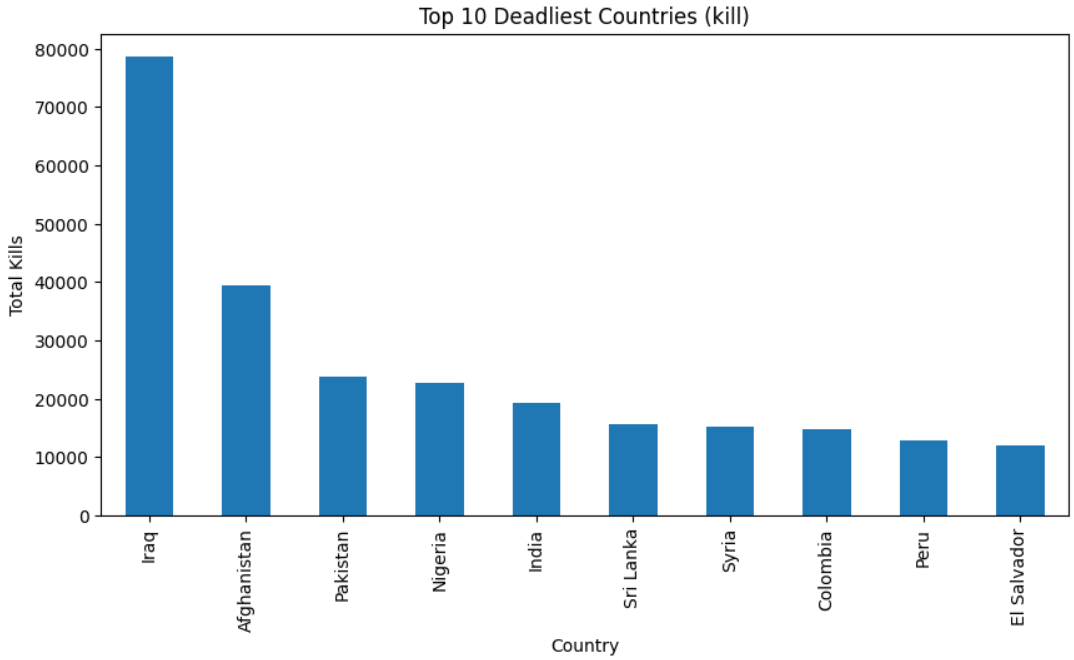

Figure 3: Top 10 Deadliest Countries by Kills

Key Findings

- Iraq has the highest number of kills, showing it is the most affected country.
- Afghanistan and Pakistan also report very high kills.
- India appears among the top countries, showing significant human loss.
- Some countries with fewer attacks still have high kills.
- Kills are concentrated in a few countries rather than evenly spread.

5.4. Distribution of Attack Types

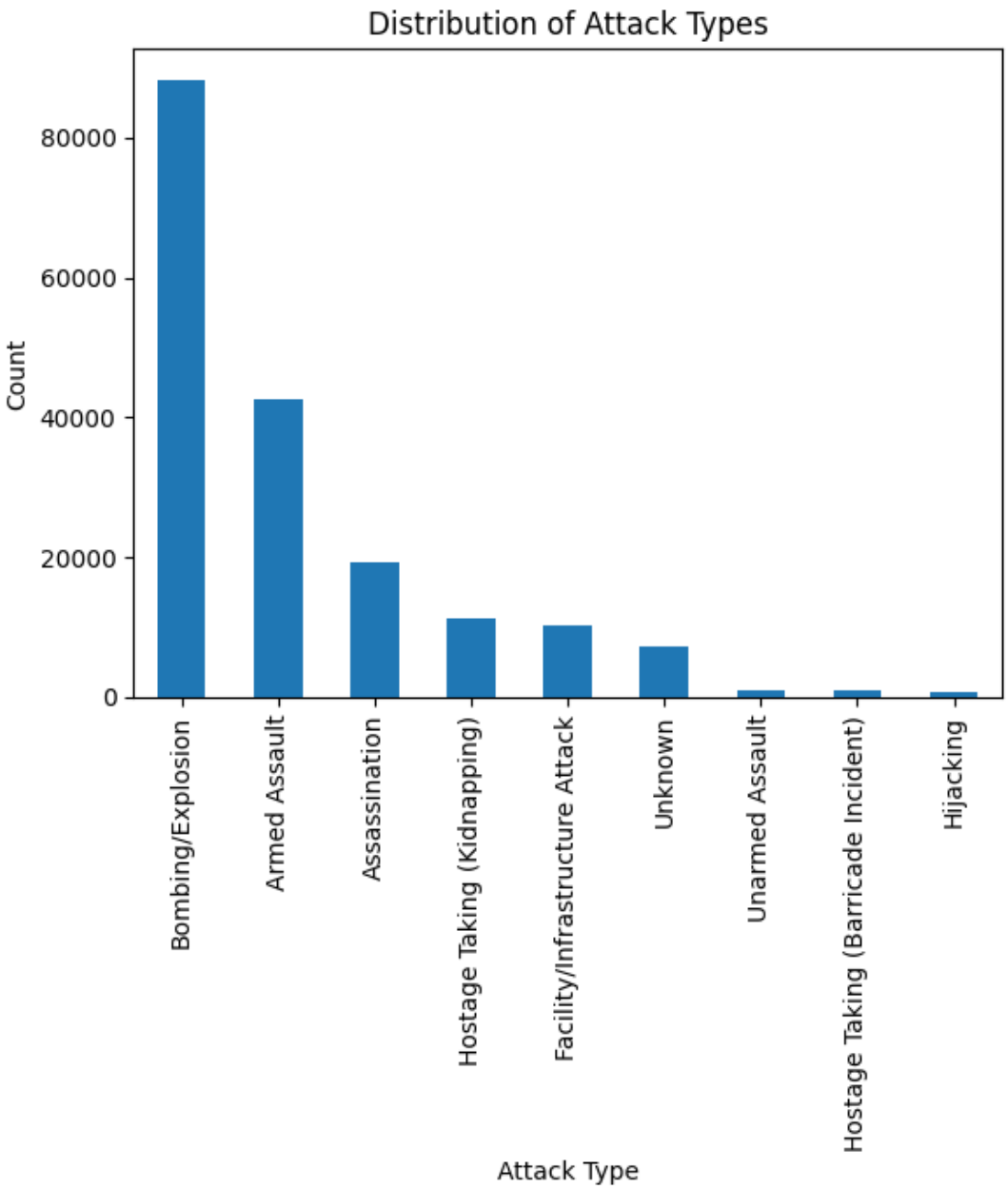

Figure 4: Distribution of Attack Types

Key Findings

- Bombing and explosion is the most common attack type.
- Armed assault is the second most frequent method.
- Other attack types are very rare in comparison.

5.5. Weapon Types Used in Attacks

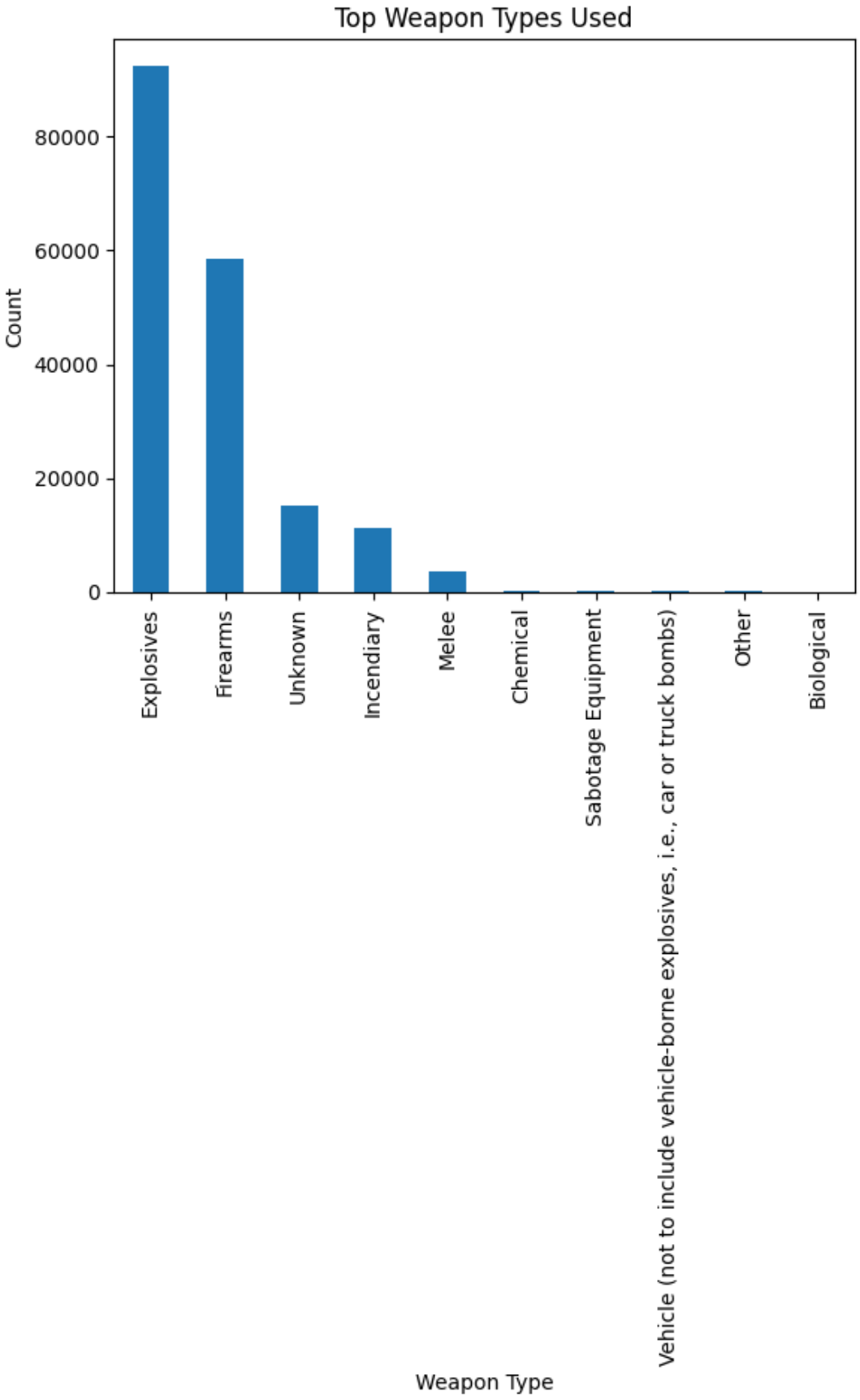

Figure 5: Weapon Types Used in Terrorist Attacks

Key Findings

- Explosives are the most commonly used weapons.
- Firearms are the second most used weapon type.
- Chemical and biological weapons are used very rarely.

5.6. Impact Analysis: Kills vs Injuries

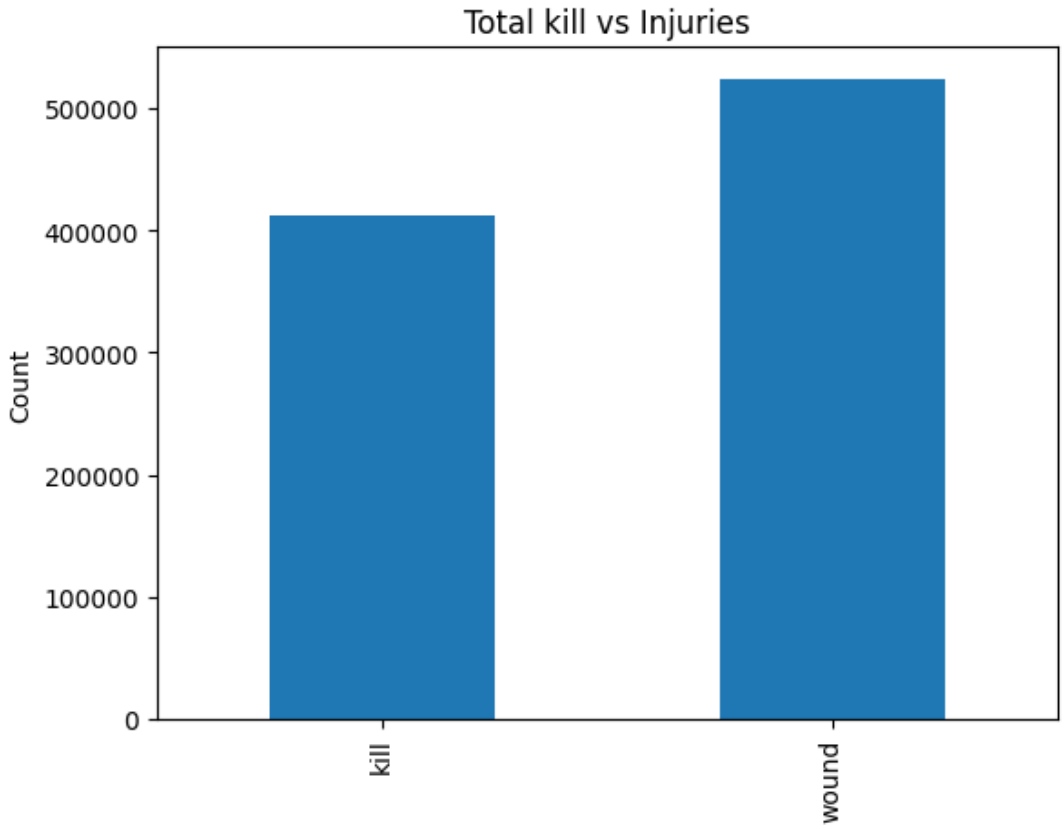

Figure 6: Total Kills vs Injuries

Key Findings

- The total number of injuries is higher than total kills.
- Many attacks injure people even without causing deaths.
- Terrorist attacks have a large human impact beyond kills.

5.7. Correlation Analysis Between Key Variables

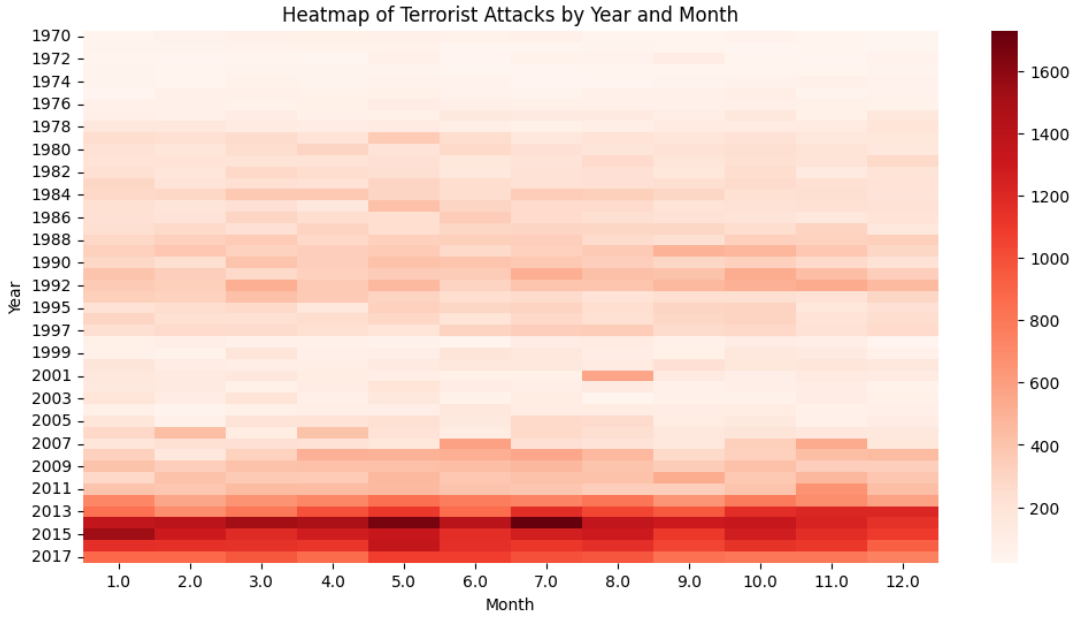

Figure 7: Correlation Heatmap of Key Numerical Variables

Key Findings

- Terrorist attacks increased significantly after 2010 across almost all months.
- No single month consistently dominates, showing attacks happen throughout the year.
- Peak years show high activity in many months, not just in a specific season.

5.8. Terrorist Attacks by Region

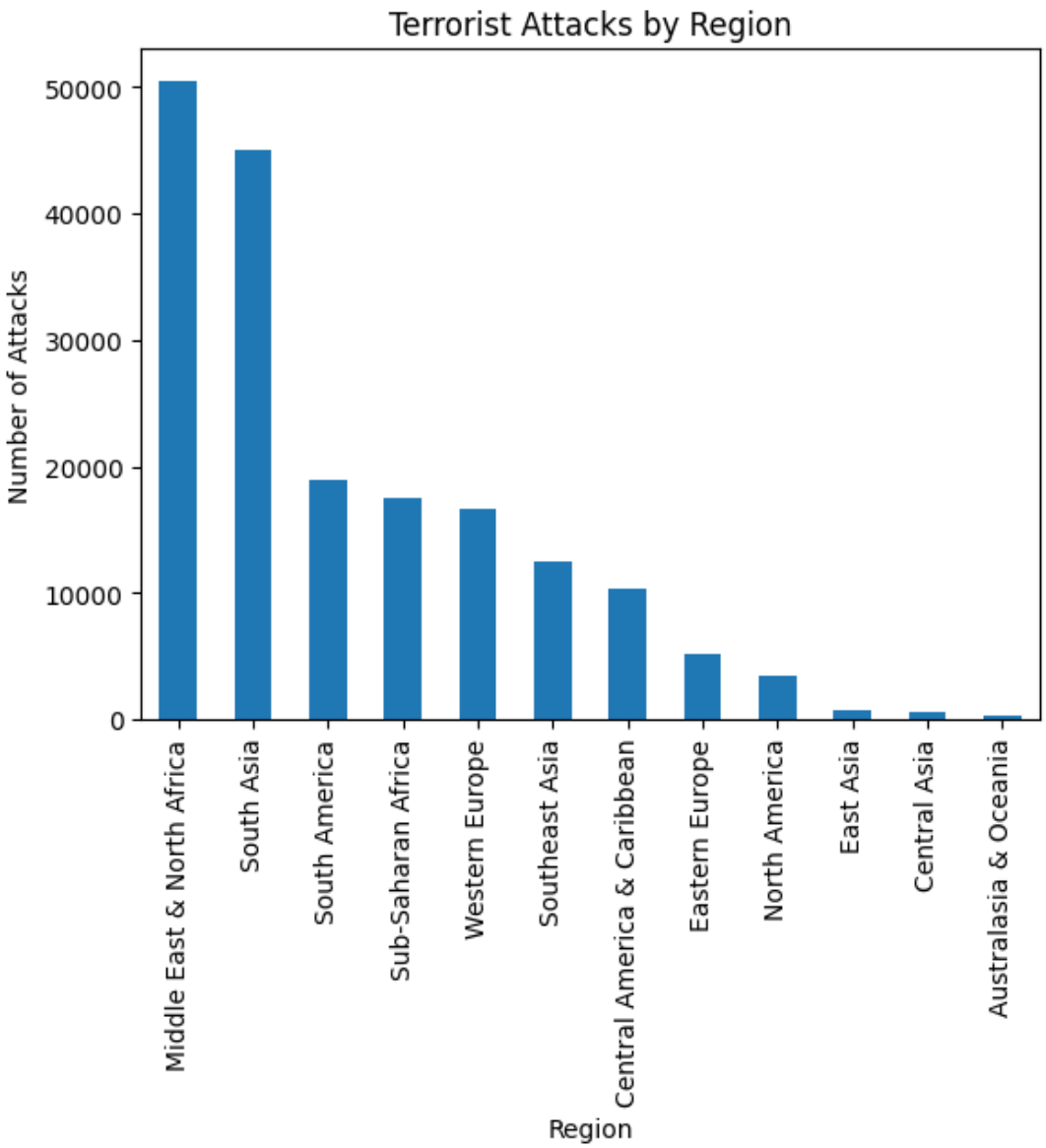

Figure 8: Terrorist Attacks by Region

Key Findings

- Middle East & North Africa has the highest number of attacks.
- South Asia is the second most affected region.
- Some regions report very few terrorist attacks.

5.9. Year-wise Terrorist Attacks by Region

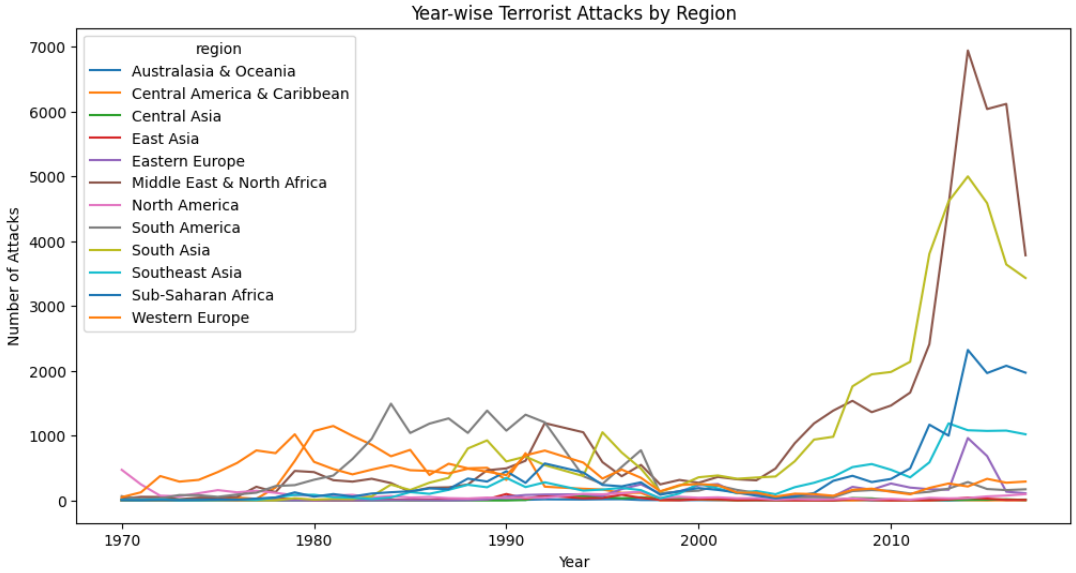

Figure 9: Year-wise Terrorist Attacks by Region

Key Findings

- Terrorist attacks increased sharply after 2010 in many regions.
- Middle East & North Africa shows the highest rise.
- Some regions show a decline after peak periods.

5.10. Total Kills by Attack Type

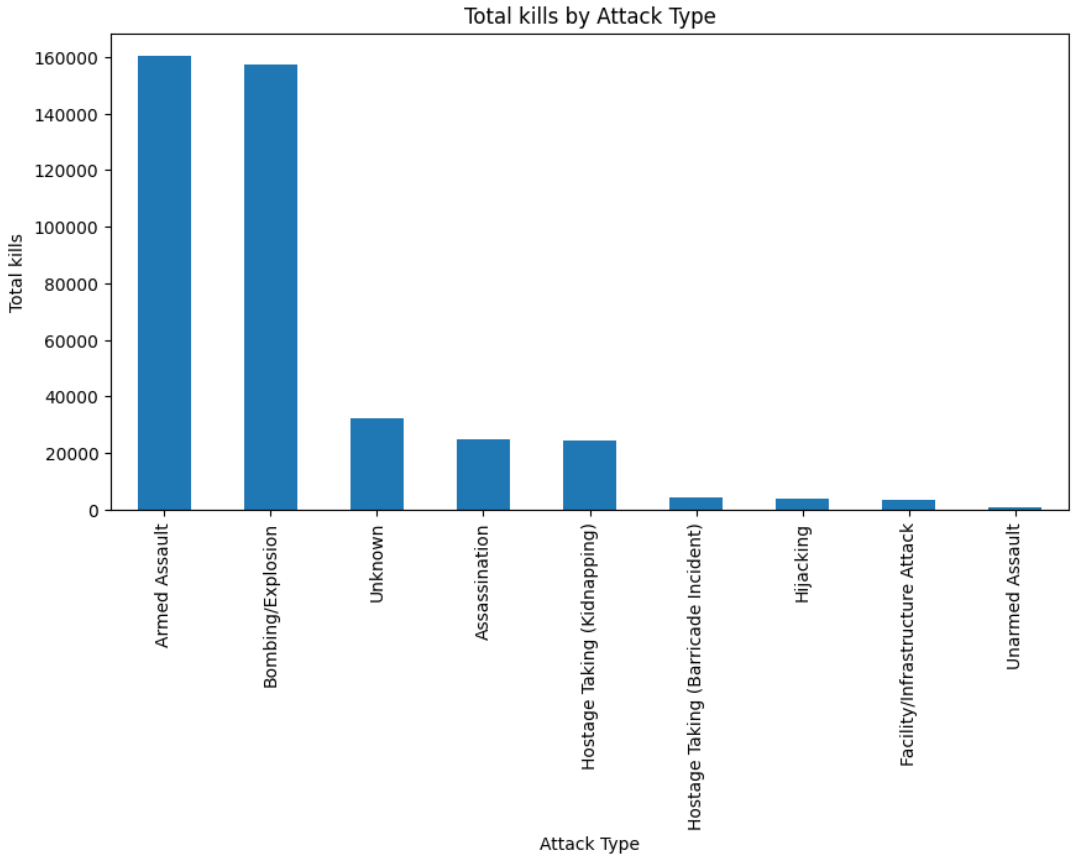

Figure 10: Total Kills by Attack Type

Key Findings

- Armed assault and bombing/explosion cause the highest kills.
- These attack types are extremely dangerous.
- Other attack types cause far fewer kills.

5.11. Top Terrorist Groups by Kills

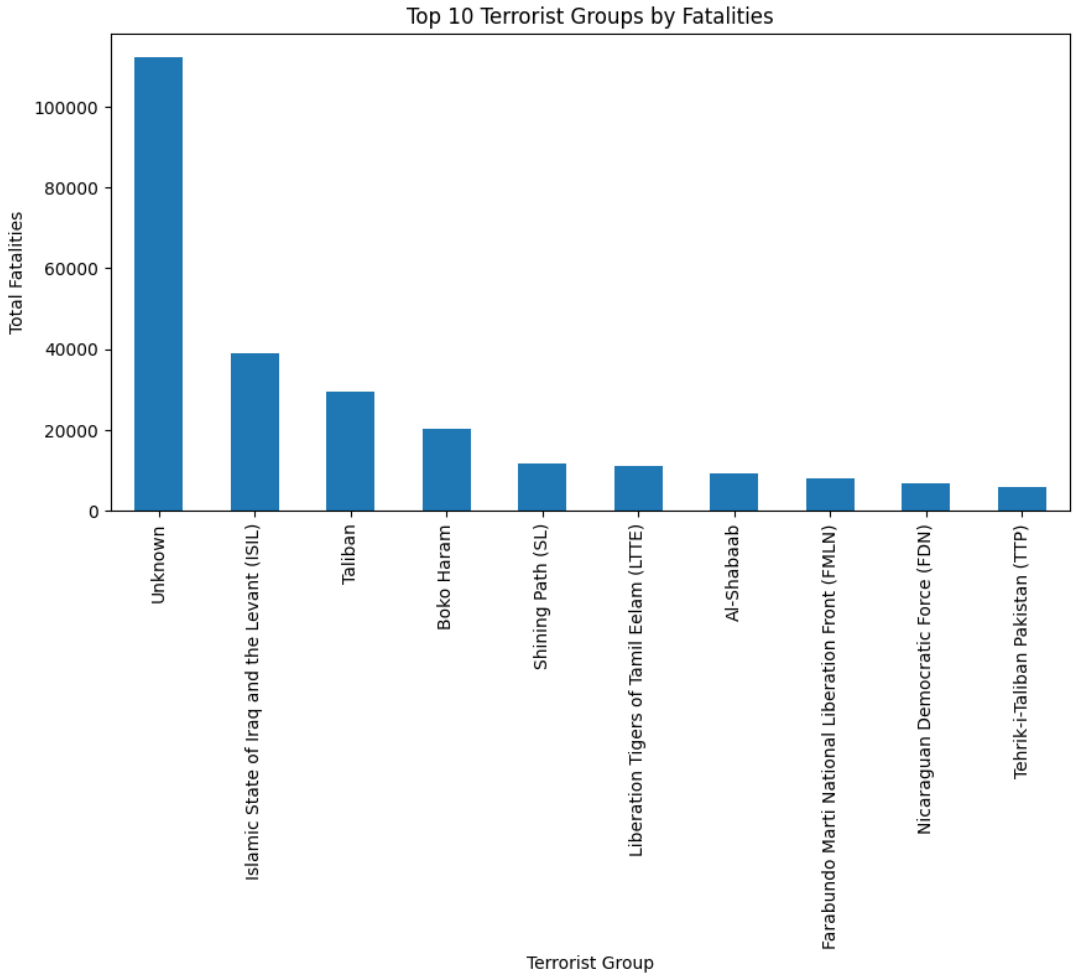

Figure 11: Top Terrorist Groups by Kills

Key Findings

- Many kills are linked to attacks by unknown groups.
- ISIL and Taliban are among the deadliest known groups.
- A small number of groups cause most kills.

6. Conclusion

The analysis shows that terrorism is concentrated in specific regions, countries, attack types, and terrorist groups. Bombings and armed assaults cause the highest kills and injuries. These insights highlight the importance of data-driven approaches for security planning and risk assessment.