Descriptive Analysis of Global Terrorism

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Abstract

This study provides a broad descriptive analysis of global terrorism data from 1970 to 2017, identifying the top 10 countries with the highest number of terrorism events, the most commonly used weapons, and the deadliest terrorist groups. The research utilizes the Global Terrorism Database (GTD) to gain insights into regions with high terrorism risk and to understand the changing nature of terrorism. The findings reveal that Afghanistan, Iraq, Nigeria, Pakistan, and India are among the top countries affected by terrorism, while countries like Russia, Algeria, and Sri Lanka experienced a reduction during 2012-2017. Explosives and firearms are identified as the primary contributors to fatalities, with 2014 experiencing the highest number of terrorism events. The study also highlights the deadliest terrorist groups, including the Islamic State of Iraq and the Levant (ISIL), the Taliban, and Boko Haram.

The research has both theoretical and practical implications, contributing to a broader understanding of terrorism. Future research should focus on analyzing correlated factors, local context, and qualitative data to better understand the causes and effects of terrorism.

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Chapter 1

Introduction

1.1 Background information and context for the research

We will use the Global Terrorism Database(GTD) from Kaggle to conduct our research. GTD is one of the largest open-source databases on terrorism. GTD contains information on over 180,000 incidents ranging from 1970-2017. The data is collected from 163 countries, and they make up 99.7% of the world's population. [2] To get a good understanding and introduction, we have read several studies and looked at previous research that has used the GTD. These research papers highlight the benefits and challenges of using the GTD. Geographical perspectives, database construction, machine learning techniques and terrorist attack classification have been covered using the GTD.

1.2 Problem statement

Global terrorism is an ongoing threat to the world and has considerable consequences for human life. As such, we wanted to see numerics on terrorism, and to visualise terrorism using the GTD database, to gain a broad understanding of terrorism between 1970 and 2017, With good data, trends and patterns can emerge and help answer our questions regarding terrorism. The key to doing this and generating the answers, visualisations and understanding the data. This will help get a broad understanding of terrorism and be a springboard for future studies.

Our study will try to find what region and country have the most deaths due to terrorism, what weapon is most common, and the average number of deaths per attack, to mention a few of those questions. We will go over those questions

with a quantitative approach and visualise the numerical values

1.3 Aim and objective

The primary aim of this research is to analyse the Global Terrorism Database and look at what the numbers tell us to get a broad understanding of past global terrorism.

The specific objectives are as follows:

- Analyse terrorism by country and identify the most affected countries over the years.
- Investigate the most common weapon types used in different regions and their impact on fatalities.
- Examine terrorism trends and patterns, including the deadliest years and countries with the highest number of deaths.
- Identify the deadliest terrorist groups.

1.4 Scope and limitations

This research focuses on the Global Terrorism Database, which provides extensive data on terrorist incidents worldwide. The study's scope is limited to the variables and information available within the dataset, which may not cover all the aspects of terrorism. Additionally, the accuracy and completeness of the data are subject to the quality of the reporting and documentation of terrorist incidents. A comprehensive list of limitations of the GTD can be found here at the GTD webpage **https://www.start.umd.edu/gtd/**

1.5 Document structure

The report is structured as follows:

1. **Introduction:** Provides background information and context for the research, problem statement, aim and objectives, scope and limitations, and document structure.

2. **Literature Review:**: Reviews key concepts, previous research, and studies related to the topic and explores appropriate technologies for the research.

3. **Methodology:** Describes the research design, approach, sampling method, data collection methods, data analysis techniques, theoretical concepts, validity and reliability, and ethical considerations.

4. **Results:** Presents the main data collection and analysis findings, focusing on tables and figures to better present information.

5. **Discussion:** Explains the findings and discusses their importance to the research questions, limitations and our recommendations for possible future research.

6. **Conclusion:** This summarises the research we have conducted, what we found, and what we believe can be used for recommendations for future research.

Chapter 2

Literature Review

2.1 Introduction

After 9/11, the world became increasingly concerned about terrorist attacks and their effect. Government and scholars have studied terrorism for years to help to find trends, patterns and the cause. This literature review gave us a broader and better understanding of terrorism, its impact on different regions, and trends. This literature review gives a broad understanding of the literature and different aspects of terrorism and provides us with the knowledge to work on our study.

2.2 Keywords related to the research topic

Some critical concepts related to the research topic of our global terrorism analysis are, also found in abstract:

- Terrorism
- Regions
- Weapons
- Fatalities
- Terrorist Groups

2.3 Review of previous research and studies conducted by other researchers

Table 2.1: An Overview of Geographical Perspectives and Approaches in Terrorism Research by Karim Bahgat and Richard M. Medina [1]

Research objective	This paper aims to give an understanding and overview of geographical approaches and their importance. The importance of geographical location and timing is highlighted. The benefits of innovation in geographical technologies are shown, and advancement is encouraged.
Problem or gap addressed	During their research, the authors dealt with a lack of complete reviews of methods in terrorism research, arguing that geographical research and perspectives can give a good insight into terrorism causes and patterns.
Findings and conclusions	Geographical methods are essential in analysing terrorism data, with applications like point pattern analysis, network analysis, and geographical econometrics. The paper underscores the significance of geographical technologies.
Limitations or weaknesses	Gathering good data with geographical technology is challenging and expensive. This has led to a loss of opportunity as specific approaches need to be covered, and a lot of data has been lost because it is too expensive and hard to gather.
Implications or suggestions for future research	Future research should develop advanced geographical analysis methods, integrate multiple data sources, and encourage cooperation between terrorism researchers and geographers.
How our research can fill the gap	Build on the insights from the paper on geographical perspectives and approaches, our research conducts a broad, comprehensive descriptive analysis of global terrorism. By examining aspects such as weapon usage, countries with high terrorism rates, and hot zones, our study expands the understanding of global terrorism's geographical aspects.

Table 2.2: Building a Global Terrorism Database by Gary LaFree ; Laura Dugan ; Heather V. Fogg ; Jeffrey Scott [8]

Research objective	This research aims to gather insight into terrorism trends, patterns and causes using the Global Terrorism Database (GTD). This data and research aim to further our understanding of terrorism's nature and causes with the help of data analysis.
Problem or gap addressed	The authors wanted to use consistent and comprehensive data and dismissed incomplete data. This limited the author's ability to do more in-depth analyses because of incomplete data.
Findings and conclusions	GTD is a comprehensive database, including over 170,000 terrorist attacks from 1970 to 2021. GTD has been widely used for terrorism-related studies. Throughout the years, the Global Terrorism Database has allowed data-driven research of factors contributing to terrorism.
Limitations or weaknesses	Limitations of the GTD are data collection biases, different definitions for terror, and trust in open-source information; this could lead to misreported information in the database.
Implications or suggestions for future research	Further research should fine-tune the GTD and drive in-depth analysis of terrorism patterns and trends, allowing better informed and sophisticated anti terrorisms strategies to develop.
How our research can fill the gap	Leveraging the GTD, our research conducts a comprehensive descriptive analysis of past global terrorism, examining aspects like weapon usage, countries with high terrorism rates, and hotspots. By identifying trends in the decrease or increase of terrorism, our study expands the understanding of global terrorism dynamics and addresses gaps in the existing literature. This approach helps inform targeted interventions and strategies to mitigate terrorism threats.

Table 2.3: Global Terrorism Index 2022 – Economics and Peace [4]

Research objective	The study aims to comprehensively evaluate terrorism's impact worldwide, measuring effects across 163 countries using a composite score.
Problem or gap addressed	The research addresses the need for a systematic, comparative measure of terrorism impact, allowing people to identify trends, patterns, and factors that drive terrorism.
Findings and conclusions	The study ranks countries based on their terrorism impact scores, highlights regions with high levels of terrorism, and explores underlying factors.
Limitations or weaknesses	Limitations include reliance on the Global Terrorism Database, potential biases, and the inability to capture the full complexity of terrorism's impact.
Implications or suggestions for future research	The study suggests further research be conducted on the factors that drive terrorism, counter-terrorism effectiveness, and its interplay with other global issues.
How our research can fill the gap	Expanding on the study's findings, our research will focus on a descriptive analysis of past global terrorism, examining weapons used, countries with high terrorism rates, and terrorism hot zones. By exploring increases and decreases in terrorism, our work will contribute to a broad and deeper understanding of terrorism trends.

Table 2.4: Internet, Political Regime and Terrorism: A Quantitative Analysis by Nikita Khokhlov and Andrey Korotayev [6]

Research objective	This research investigates the link between internet access, political regimes, and terrorist incidents, aiming to clarify the role of these factors contributing to the occurrence of terrorism.
Problem or gap addressed	The study addresses the knowledge gap concerning the influence of the internet and political regime types on terrorist activities.
Findings and conclusions	Increased internet connection relates positively to terrorist incidents, particularly in autocratic countries. However, democratic countries with high internet penetration experience fewer incidents than their autocratic counterparts.
Limitations or weaknesses	The analysis is limited to specific countries and periods, potentially affecting generalizability. The study does not account for other influencing factors.
Implications or suggestions for future research	Future research should expand the analysis, include more countries, periods, and additional factors, and explore the interaction mechanisms between the internet, political regimes, and terrorism.
How our research can fill the gap	By focusing on a broad descriptive analysis of past global terrorism trends, our research will help identify patterns, such as weapon usage, countries most affected, and terrorism hot zones. By examining increases or decreases in terrorism over time, our research will contribute to a more comprehensive understanding of global terrorism and its evolution.

Table 2.5: Machine Learning Techniques to Visualize and Predict Terrorist Attacks Worldwide using the Global Terrorism Database by Enrique Lee Huamaní, Alva Mantari Alicia, Avid Roman-Gonzalez [11]

Research objective	This research aims to use machine learning to visualise and predict terrorist attacks using the Global Terrorism Database, improving the understanding of terrorism patterns and aiding in forecasting incidents.
Problem or gap addressed	The authors address the need for data-driven methods to analyse and predict terrorist attacks, applying machine learning techniques to uncover patterns and trends that traditional approaches might miss.
Findings and conclusions	The authors employ machine learning algorithms to effectively visualise, analyse, and predict terrorist attacks, identifying geographic, temporal, and attack characteristics. However, model accuracy is limited by data quality and the complexity of predicting terrorist attacks.
Limitations or weaknesses	The limitations include the reliance on the quality and comprehensiveness of the Global Terrorism Database data, the inherent complexity of predicting terrorist attacks, and the possibility of unaccounted factors influencing terrorism patterns.
Implications or suggestions for future research	Further refining and expanding machine learning models, incorporating additional data sources, and exploring advanced techniques such as deep learning will improve predictive performance and contribute to a deeper understanding of terrorism patterns.
How our research can fill the gap	By conducting a broad descriptive analysis of past global terrorism, our research can provide a comprehensive overview of terrorism trends, patterns, and hotspots. This analysis will help identify regions that have experienced increased or decreased terrorist activity and shed light on the factors that have contributed to these changes. By doing so, our research can complement and extend the existing literature on terrorism.

Table 2.6: Putting Terrorism in Context by Gary LaFree, Laura Dugan, Erin Miller[10]

Research objective	This research aims to analyse the Global Terrorism Database (GTD) to investigate terrorism, understand its patterns and trends, and inform counter-terrorism policy development.
Problem or gap addressed	The authors address the need for systematic terrorism analysis using the GTD to understand contributing factors better and guide effective counter-terrorism measures.
Findings and conclusions	The authors highlight terrorism's changing nature, differing patterns and trends across regions, and factors like political instability, economic conditions, and extremist ideologies. They also add the importance of local context in terrorism analysis.
Limitations or weaknesses	The study relies on the GTD, which may have data biases and inaccuracies and does not account for all potential terrorism-influencing factors.
Implications or suggestions for future research	Future research should continue investigating terrorism, exploring relationships with other global issues, and assessing counter-terrorism strategy effectiveness.
How our research can fill the gap	Building on the existing research, our study can offer a broad view of the patterns of weapon usage, identify countries most affected by terrorism, and pinpoint hot zones of terrorist activity. By investigating increases and decreases in terrorism over time, we can contribute to a more comprehensive understanding of global terrorism trends..

Table 2.7: Quantitative Research on Global Terrorist Attacks and Terrorist Attack Classification by Xueli Hu, Fujun Lai, Gufan Chen, Rongcheng Zou and Qingxiang Feng [5]

Research objective	This research aims to analyse global terrorist attacks using the Global Terrorism Database and develop a classification system for these incidents, offering insights into terrorism patterns and trends.
Problem or gap addressed	The authors develop a systematic classification system for terrorist attacks to facilitate a more nuanced understanding and analysis of terrorism for researchers, policymakers, and practitioners.
Findings and conclusions	The authors identify patterns and trends in global terrorism and create a classification system based on various attributes. This system enables a more detailed analysis of terrorist incidents.
Limitations or weaknesses	The study relies on the GTD, which may have biases and inaccuracies. The classification system may not capture the full complexity of terrorist attacks or account for all influencing factors.
Implications or suggestions for future research	Future research should refine and expand the classification system, incorporating additional attributes or data sources, and explore relationships between attack attributes and outcomes.
How our research can fill the gap	Our research can complement the existing analysis by examining the interplay between factors such as weapon types, heavily affected countries, and terrorism hot zones while also exploring trends in increasing or decreasing terrorism incidents. This approach will enrich the current understanding of global terrorism patterns and contribute to a more comprehensive view.

Table 2.8: The Global Terrorism Database (GTD): Accomplishments and Challenges by Gary LaFree [7]

Research objective	This research aims to analyse the Global Terrorism Database (GTD) to understand terrorism patterns and trends while recognising its limitations and challenges.
Problem or gap addressed	The need for a comprehensive terrorism dataset is addressed by the GTD, which has become a widely-used resource despite its limitations.
Findings and conclusions	The GTD has significantly contributed to understanding terrorism patterns and trends but faces challenges related to data collection biases, inaccuracies, and keeping up with evolving terrorism.
Limitations or weaknesses	The GTD relies on open-source information, which can be biased and incomplete. Additionally, maintaining an up-to-date database is challenging due to the evolving nature of terrorism.
Implications or suggestions for future research	Future research should combine the GTD with other data sources and methods to overcome biases and inaccuracies, refine analyses, and improve the GTD.
How our research can fill the gap	Our research can augment the current understanding of global terrorism by conducting a broad descriptive analysis of past events, focusing on factors such as weapon types, countries with the highest occurrence of terrorism, and hotzones. By investigating the increase or decrease in terrorist incidents, we can provide valuable insights into the changing dynamics of terrorism, ultimately contributing to a more comprehensive view of the subject and addressing existing gaps in the literature.

2.4 Exploration of appropriate technologies that will be useful during the research

Selecting the right technologies is crucial for effectively analysing global terrorism data. This project used various tools to process and visualise the data. Excel was used for initial data cleaning and testing various graphs. We also used Python programming to clean, edit and process the data efficiently. Pandas, a Python library, offered a versatile data structure for organising and analysing the data. Pandas and Python were used for numerical computing operations on the data. For creating visualisations, we relied on Matplotlib and Seaborn to produce plots and charts. To generate the report, we used LaTeX.

These appropriate technologies facilitated our comprehensive data analysis, enabling us to present our findings clearly and straightforwardly. Python programming language helped us efficiently process the large dataset, and Pandas library allowed for flexible organisation and analysis of the data. Additionally, Python was used for numerical computing, and Excel was applied for data management and analysis. Lastly, Matplotlib and Seaborn were used for data visualisation, and LaTeX facilitated report generation.

The use of appropriate technologies is crucial in conducting an effective analysis of global terrorism data. In this project, we utilized various tools to analyze and visualize the data. Python programming language has been used to manipulate and process large datasets efficiently. Pandas, a library in Python, has provided a flexible data structure for organizing and analyzing data. NumPy has been used to perform efficient numerical computing operations on the data. For visualizing the data, we have employed Matplotlib and Seaborn for plotting and charting. Excel has also been used for managing and analyzing data. Finally, LaTeX has been used for creating the report. By using these tools and technologies, we have been able to perform an in-depth analysis of the data and present the findings in a clear and concise manner.

2.5 Critical evaluation of the material

While these studies provide valuable insights into various aspects of terrorism, there are some limitations to consider:

- Most research focuses on specific aspects of terrorism, such as geographical

distribution, weapon types, or terrorist groups. This leads to a fragmented understanding of the overall patterns and trends in global terrorism.

- Some studies rely on outdated data, as the GTD is updated every year with new incidents. This may affect the accuracy and relevance of the research findings.
- The methodologies employed in the studies vary significantly, making it difficult to compare results and draw consistent conclusions.
- The GTD has limitations, such as incomplete or missing data points, which can impact the reliability of the findings from studies that utilise the database.

  Despite these limitations, the studies reviewed provide a solid foundation for further analysis and contribute to our understanding of global terrorism. Our research aims to build upon these studies by providing a broad understanding of terrorism, weapon types, and the deadliest terrorist groups using the most recent data in the GTD.

A study that yielded low to no results for us in our analysis is An Overview of Geographical Perspectives and Approaches in Terrorism Research by Karim Bahgat and Richard M. Medina. We included this reference, though, because it furthers our broad understanding of global terrorism and domain knowledge.

2.6 Summary of the literature review

In summary, upon examining a range of research papers, it becomes clear that global terrorism is a complicated issue that creates significant challenges for people worldwide. Earlier studies have looked into factors that cause and keep terrorism going, like beliefs, financial struggles, corruption, and social problems. The impact of terrorism on a wide range of places and various groups has been examined, and the importance of finding effective methods to combat terrorism has been highlighted, such as cooperation across borders and combating corruption and poverty.

Chapter 3

Methodology

3.1 Introduction

In this section, we will describe the methodology we used to analyse the Global Terrorism Database(GTD). Throughout this chapter, we will go through our research design and approach, sampling method, data collection method, analysis techniques and procedures, theoretical concepts, validity and reliability, and the ethical considerations we took during our analysis.

3.2 Research design and approach

Our research used a quantitative approach, where we went for a descriptive approach to answering our questions. The GTD dataset provides information on around 180 000 records of terrorist incidents from around the world, stretching from 1970 to 2017. We used Excel and Python with libraries like Pandas, Seaborn, and Matplotlib to analyse the data and generate graphs, to better visualise the different questions we wanted to be answered, such as geographical distribution, weapon types, and the deadliest terrorist groups.

For each research question, we thought out how we wanted to visualise the data. We then worked on extracting the data needed to perform each analysis and implemented the code required to achieve our goals. This method of answering the questions ensured that we got the desired visualisation of each question that we answered efficiently and acceptably.

3.3 Sampling method and size

The sampling method employed in this research is a collection of sampling methods, as we have used the GTD dataset for our analysis. The GTD dataset comprises around 180 000 terrorism events that have occurred globally between 1970 and 2017. This extensive dataset allowed us to do a descriptive analysis and trends on terrorism at a global scale without conducting our own sampling. We have utilised the entire dataset and have not performed any sampling methods ourselves.

3.4 Data collection methods and instruments

The information gathered in the GTD database is gathered through open-source contributions. As they say on their webpage, "Statistical information contained in the Global Terrorism Database is based on reports from various open media sources. Information is not added to the GTD unless and until we have determined the sources are credible" [3]. For a more understanding comprehensive how the GTD database is sourced, we refer to their home page **https://www.start.umd.edu/gtd/using-gtd/**

3.5 Data analysis techniques and procedures

To analyse the GTD dataset, we used Excel to get an initial overview of the dataset; we familiarised ourselves with the columns and the meaning of each column, such as "nwound" which is a column that specifies the number of injured victims in a terrorist event, or "nkill" which is a column that specifies the number of killed victims in a terrorist event.

After familiarising ourselves with the dataset, we determined which columns we could remove to make processing the dataset more efficient. For this process, we made a list of all relevant features for the questions we wanted to answer; we then employed the Python programming language with the pandas package, which allowed us to efficiently load and work with the dataset. Pandas were used to perform a wide range of operations, such as deleting all the unnecessary columns and updating the dataset. After this process, we started working on how to further improve the efficiency; we decided to combine some rows, such as the "year"," month", and "day" columns, into a single column called date. This was, however, a trade-off as a few of the events only had a year with a missing month and day or a year and month with a missing day. We chose to delete those rows, as we agreed that, for example, changing the date from "nan.03.2012" to "01.03.2012"

would be worse than just removing it from the dataset.

In one of the visualisations we wanted, there was an issue with countries such as “East Germany” and “West Germany”, which no longer exist, while there also was “Germany” in the dataset. We discussed this and decided to change the country names of all countries that no longer exist into the current name of the country; this allowed us to get more data on countries like Germany. The trade-off for this is that specific issues in East or West Germany falsely attribute more terrorism to the other state that had nothing to do with it. However, if we did not handle it like this, there would be missing data from 1970 to 1990(Germany reunited). We did not do this for all the research questions. It was only necessary for the global map hot zone visualisation. Because some countries no longer exist, a list of all the countries changed is this:

- East Germany: Germany
- West Germany: Germany
- South Vietnam: Vietnam
- Rhodesia: Zimbabwe
- Soviet Union: Russia
- North Yemen: Yemen
- South Yemen: Yemen
- People’s Republic of the Congo: Dem. Rep. Congo
- Republic of the Congo: Dem. Rep. Congo
- Zaire: Dem. Rep. Congo
- Democratic Republic of the Congo: Dem. Rep. Congo
- Czechoslovakia: Czech Republic
- Serbia-Montenegro: Serbia
- United States: United States of America

When the data cleaning and preprocessing were completed, we worked our way through each question and performed computations and visualisations to answer each question. The method by which we solved each question is descriptive in

nature. Since we are using the entire population of data, there is no need for statistical hypothesis tests to validify our answers. The methods include using mean, sorting by values, filtering and extracting min/max values; all this is achieved with Python and the Pandas library. We also used Excel after all the data was cleaned, as the file size was now smaller and more efficient to work with; this caused Excel to be easier to work with than Pandas to gain an overview of the dataset. When we visualised the data, we focused on providing a simple graph or plot to explain the findings. We added annotations and labels to each visualisation; we achieved this with a combination of libraries, such as Pandas, matplotlib and SeaBorn. MatplotLib is a library that can create visualisations such as graphs and plots; Seaborn is a library based on MatplotLib that adds additional features.

3.6 Theoretical concepts and their relevance to the research

Our research is based on the GTD database, and we have used existing research to complement and guide our own from other research. The literature review section gives an overview of important concepts related to terrorism, like what is the definitions of terrorism, what kind of terrorism, and other factors contributing to what made a terrorist group form. We reviewed previous research and studies that have employed quantitative methods to analyse terrorism data, such as the GTD dataset. These findings informed our choice of what variables to choose and the interpretation of our findings.

3.7 Validity and reliability of the research findings

Accuracy and reliability are critical parts of any research to ensure the findings are accurate and can be trusted by others.

In our study, the necessary measure and actions have been taken to make sure that this holds true for our findings:

- We have used the GTD dataset, a comprehensive, open-source database. The GTD dataset is a reliable source of information on global terrorism incidents.
- By using the Global Terrorism dataset, we could perform descriptive statistics and discover some patterns and trends on an unbiased dataset, despite its limitations.

- We worked systematically and utilised data analysis techniques in Python, Excel, and some libraries like Pandas, Seaborn, and Matplotlib, which ensured the accuracy and consistency of our calculations and visualisations were reliable.

The quality of our research is reliant on the quality of the GTD. As the GTD is open source, it is subject to miss-reporting, and wrong countries or specifics will affect the accuracy of our findings. The nature and patterns of terrorism are always changing, and our analysis of past patterns will not always help predict future patterns.

3.8 Ethical considerations

Ethical considerations are important in any research, particularly when dealing with topics involving religion, culture and humans, as the topic of terrorism can include. We have adhered to the following ethical principles:

- We used an open-source database (GTD) that is publicly available. The database contains nothing confidential or infringes on the privacy rights of the individuals or organisations involved in the terrorism events.
- We maintained a neutral and objective stance throughout our analysis and interpretation of the findings, ensuring that our conclusions were only based on empirical evidence and not influenced by personal biases or opinions.

Chapter 4

Results

4.1 Introduction

Our research aimed to get a broad understanding of terrorism. We worked towards identifying patterns, trends, and characteristics of global terrorism. Our objectives included examining terrorism by country, weapon types, terrorism trends and patterns, and the deadliest terrorist groups. In this section of our report, we will present the result of our research. The analysis is based on the methodology described in the report's Methodology section.

4.2 Restatement of the aim and objective of the research

The primary aim of our research was to identify patterns, trends, and characteristics of global terrorism. Our objectives included examining terrorism by country, weapon types, terrorism trends and patterns, and the deadliest terrorist groups.

4.3 Presentation of the main findings of the data collection and analysis

4.3.1 Terrorism by country

a. Global Map of Terror Distribution

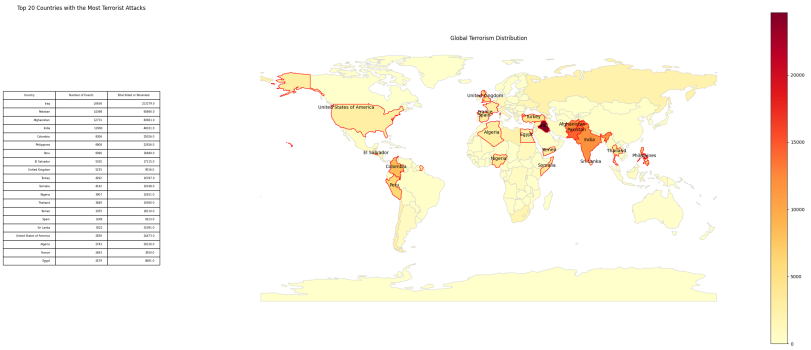

Figure 4.1: Global map showing the distribution of terrorism incidents with accompanying table of data.

This map was not meant to answer any specific research questions but visualise where global terrorism was most active, also called a “hot zone”, which tells us that the middle east is the region with the most terrorism.

b. Top 10 countries with the most terrorism events from 1970 to 2017

Based on the available data, the top 10 countries with the highest number of terrorism events over the years are as follows:

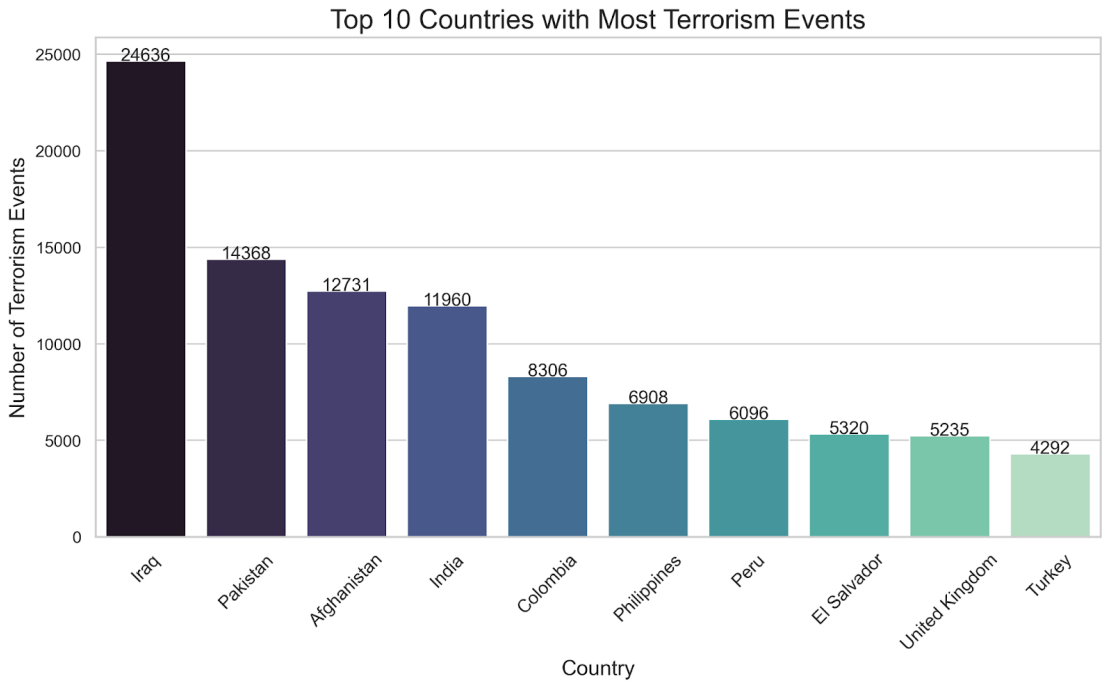

Figure 4.2: Bar chart showcasing the countries with most acts of terrorism from 1970-2017

The objective of the graph is to present what countries have the most terrorist events. We organised the data by country and counted the number of events; this lets us identify the top 10 countries most affected by terrorism. The resulting visualisation showcases the number of terrorism events for each of the top 10 countries, offering insights into the global distribution of these events.

The countries with the most terrorism over the years include Afghanistan, Iraq, Nigeria, Pakistan, and India.

c. Top 10 countries with the most terrorism from 2012 to 2017

Between 2012 and 2017, the top 10 countries with the highest number of terrorism events were as follows:

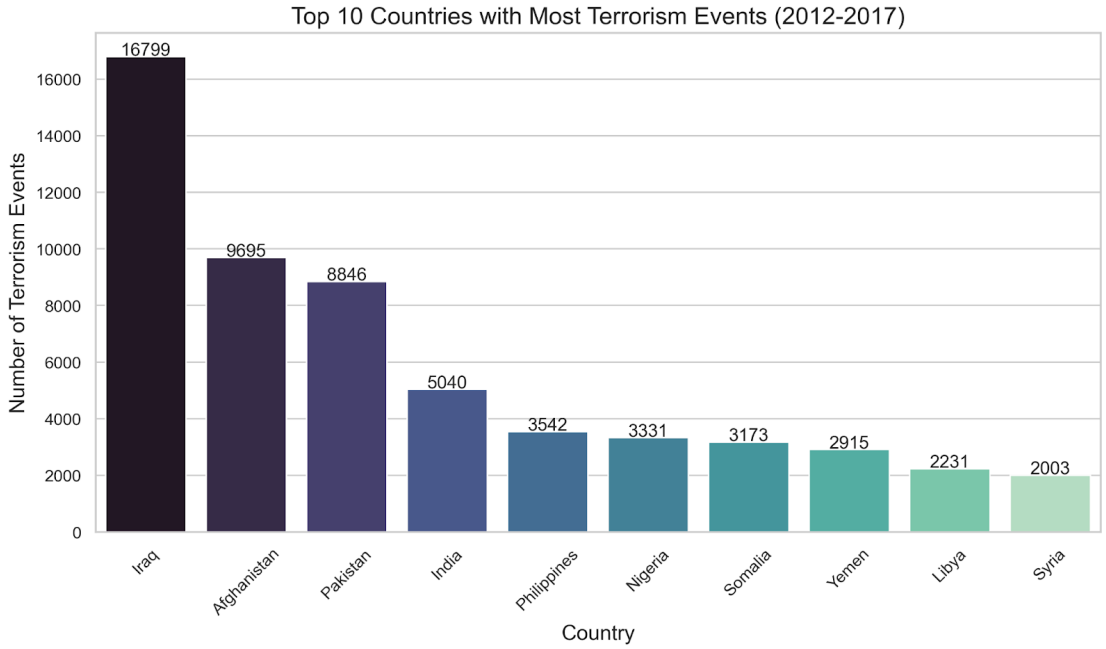

Figure 4.3: Bar chart showcasing the countries with the most acts of terrorism from 2012-2017

Our objective was to identify the top 10 countries that experienced the highest number of terrorism events between 2012 and 2017. By grouping the data by country and counting the events, we identified the top 10 countries for this period. The graph displays the top 10 countries with the highest number of terrorism events between 2012 and 2017, providing valuable insights into the global distribution of these events during this period.

The top 10 countries with the most terrorism in recent times (2012-2017) are Afghanistan, Iraq, Nigeria, Pakistan, Syria, Somalia, India, Yemen, Egypt, and the Philippines.

d. Top 10 countries with reduced terrorism from 2012 to 2017

Between 2012 and 2017, the top 10 countries that experienced a significant reduction in terrorism events compared to the period of 2007-2011 are as follows:

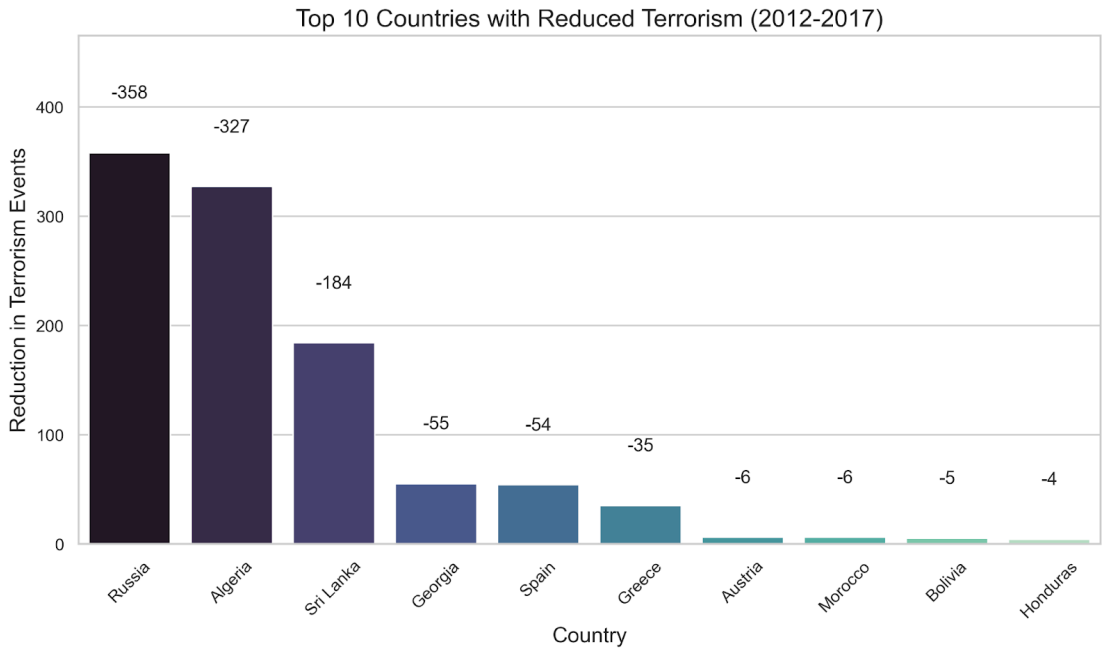

Figure 4.4: Bar chart showcasing the countries with the most decrease in terrorism from 2012-2017

We wanted to identify the top 10 countries with the most significant decrease in terrorism events between two periods: 2007-2011 and 2012-2017

We compiled data on terrorism events in each country and counted the events for each time frame. We calculated the difference in terrorism events between the two-time frames, dropped NaN values, and sorted the difference in descending order. That gave us the numbers to identify the top 10 countries with the most reduced terrorism based on events.

The resulting graph displays the top 10 countries with the most significant decrease in terrorism events between 2012-2017 compared to the 2007-2011 period, providing valuable insights into the evolving landscape of global terrorism.

Countries with reduced terrorism in recent times include Russia, Algeria, and Sri Lanka.

4.3.2 Weapon types and terrorism

a. Most common weapon types in different regions

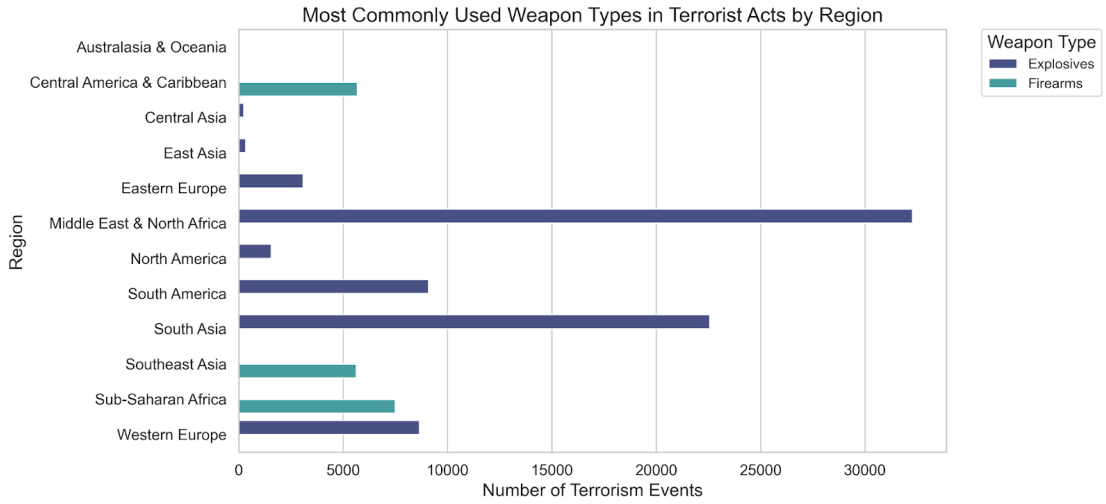

Figure 4.5: Bar chart showing the most commonly used weapon types in all regions

Our objective was to identify the most commonly used weapon types in terrorist acts by region. We grouped the data by region, collated data on weapon type, and counted the number of events for each combination. We identified the weapon type with the highest count in each region and determined each region's most commonly used weapon type.

The resulting graph displays the weapon types most commonly used in terrorist acts by region, offering valuable insights into the weapon preferences of terrorist groups across different geographical areas.

Explosives are the most common weapon to use.

b. Weapon types and their impact on fatalities

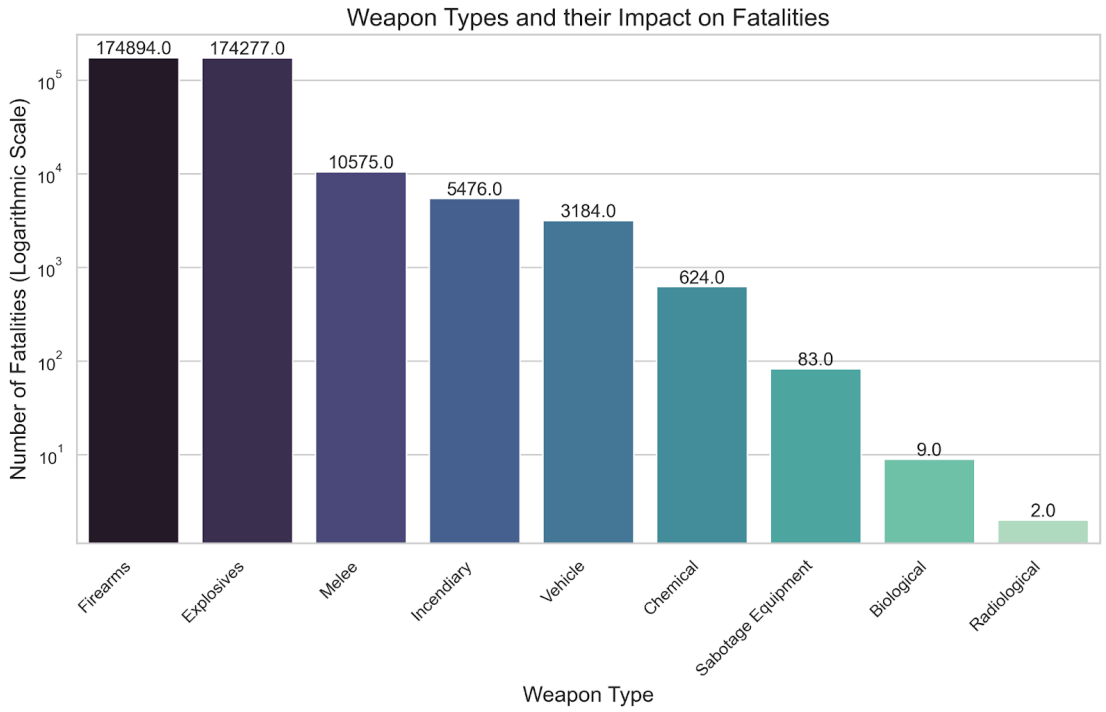

Figure 4.6: Bar chart showcasing the most deadly weapons, based on number of fatalities

We wanted to examine the impact of different weapon types on fatalities in global terrorism. By calculating the number of fatalities for each weapon. Excluding the categories" Unknown"," Other", and" Fake Weapons". We renamed the category "Vehicle (not to include vehicle-borne explosives, i.e., car or truck bombs)" to just be named "Vehicle" to make it easier to interpret.

The graph illustrates the impact of the different weapon types on fatalities, giving insights into the potential of different weapons in terrorist acts.

The graph tells us that firearms, closely followed by explosives, are the weapon types that contribute the most to fatalities.

4.3.3 Terrorism trends and patterns

a. Most terrorism events in a single year

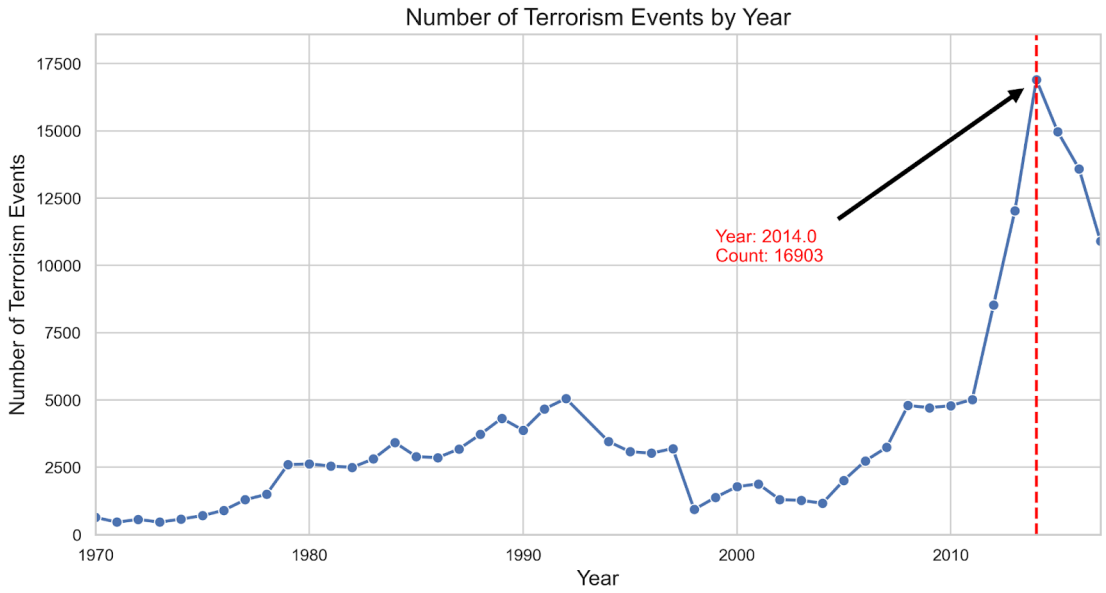

Figure 4.7: Graph over terrorism events per year

We aimed to investigate the trajectory of global terrorism events over time. We utilised a methodology that grouped the data by year and counted the number of terrorism events each year. The portrayed graph effectively illustrates the trend of terrorism events over time, revealing important insights into the dynamics of global terrorism throughout the years.

The graph peaked in 2014 with a terrorism event count of 16903.

b. Number of deaths per attack for some countries

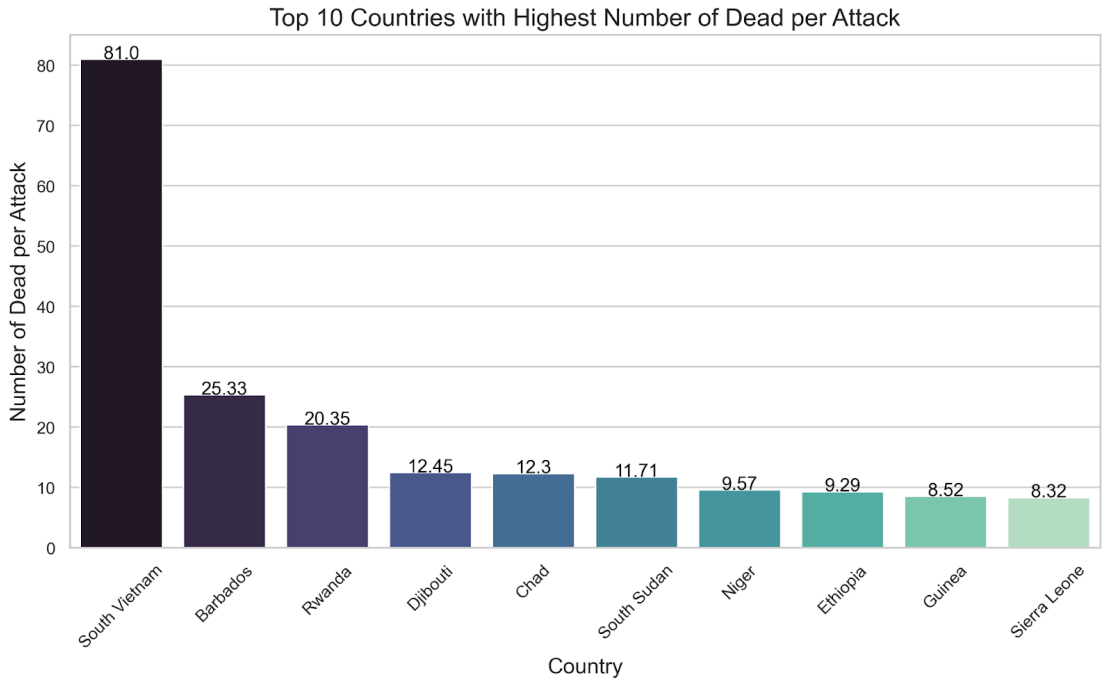

Figure 4.8: Bar chart over fatalities per event for the top 10 countries

By dividing the number of deaths by the number of attacks for each country, we found the number of dead per attack, and we could establish what country had the most deaths per terrorist attack. The resulting graph shows the top 10 countries with the highest numbers of deaths per attack. We would like to point out that South Vietnam had many deaths per attack because of the Vietnam War. Viet Cong used terrorism regularly against the South Vietnam population.

This is the average death count per attack. South Vietnam have a high number of deaths per attack due to the Vietnam War, where terror was used against civilians.

c. Top 5 countries with the most deaths in total

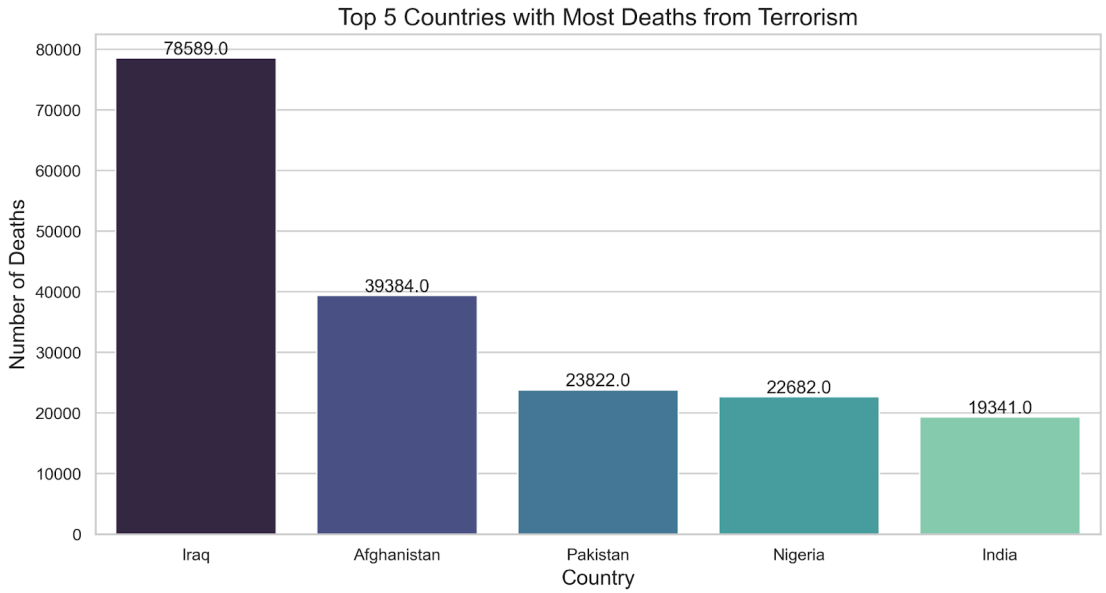

Figure 4.9: Bar chart over total fatalities for top 5 countries

Our goal was to find which countries were in the top 5 countries with the most deaths caused by terrorism. To achieve this, we grouped the data by country and summed the number of fatalities for each country. The resulting graph effectively presents the top 5 countries with the most deaths from terrorism.

The chart shows Iraq with 78589 total fatalities, the country with the most fatalities.

d. Comparative analysis of terrorism intensity: Top 5 countries and Global Patterns

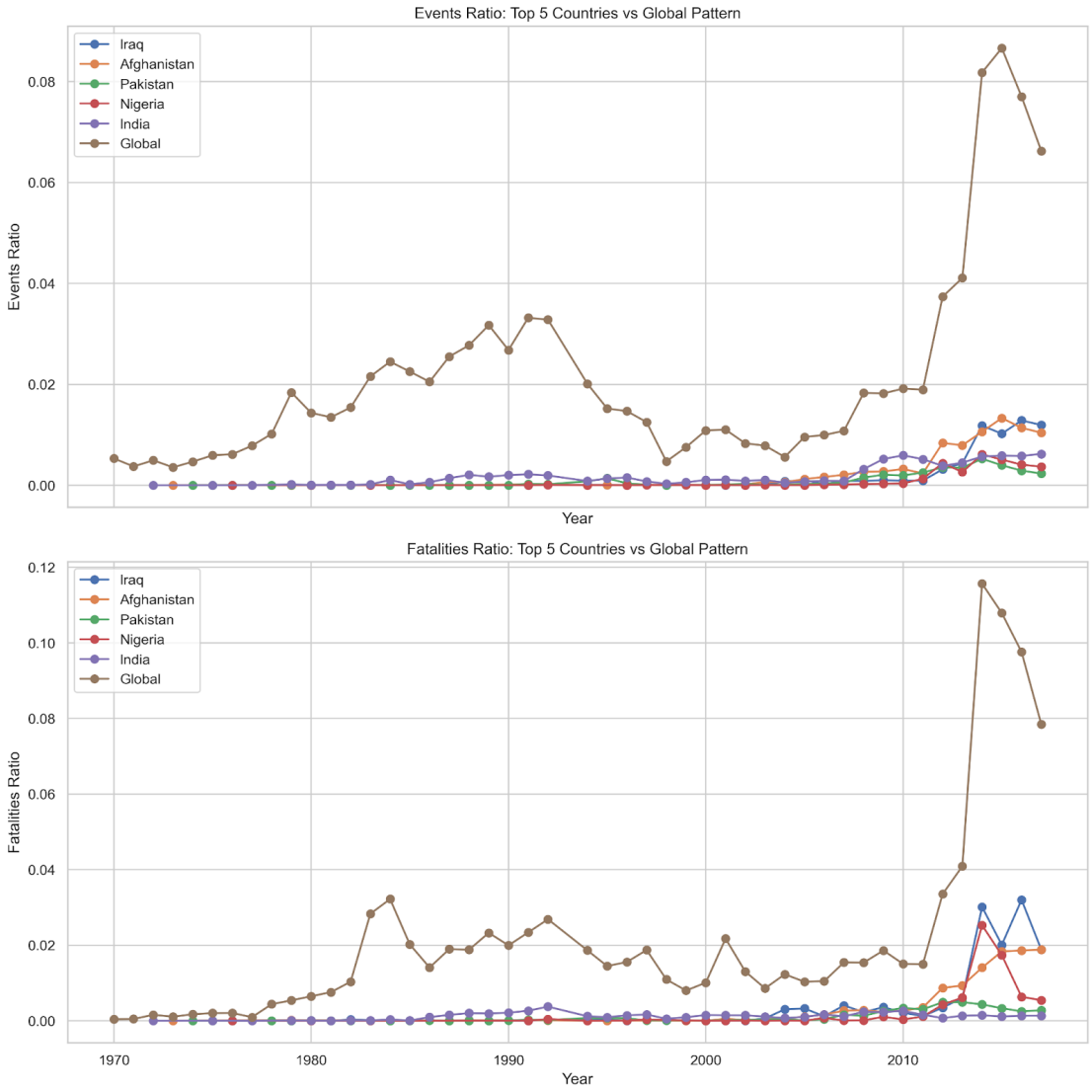

Figure 4.10: Graph with the ratio of events and fatalities for the top 5 countries compared to the global average

We aimed to compare the top 5 countries with the highest number of fatalities due to terrorism to the global pattern. We calculated the total number of events and fatalities globally and computed the ratios of events and fatalities for each year.

The resulting graphs display the trends and differences in the events and fatal-

ities. Ratios for the top 5 countries and the global pattern, providing valuable insights into the dynamics of terrorism over time.

The graphs represent the terrorist incidents and resulting fatalities in the top 5 countries with the most deaths from terrorism and the global pattern over time. The graphs are split into two parts, with the top graph showing the events ratio, which is the proportion of terrorist incidents in each country or globally, and the bottom graph showing the fatalities ratio, which is the proportion of fatalities from terrorism in each country or globally.

4.3.4 Deadliest terrorist groups

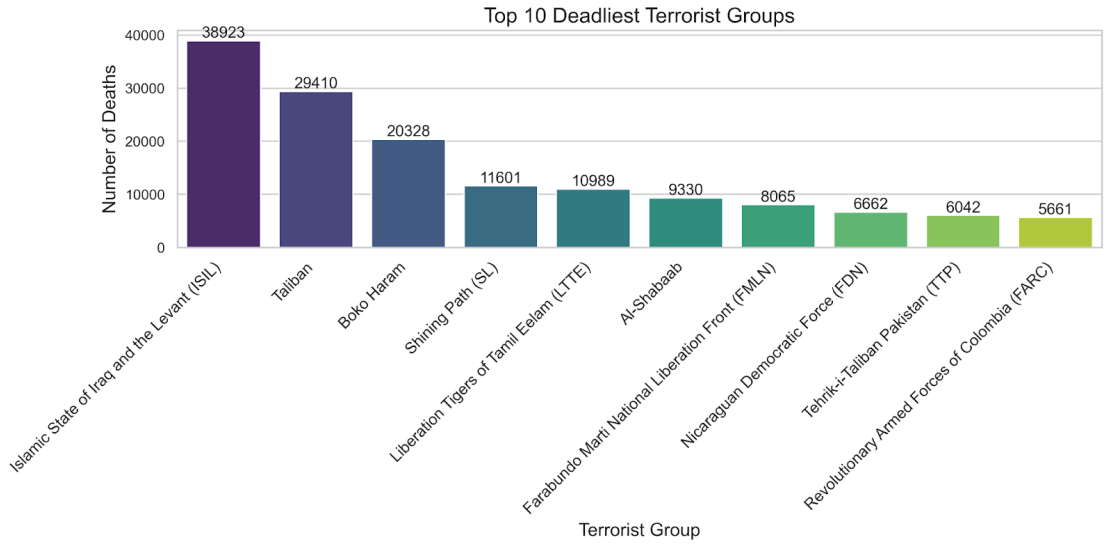

Figure 4.11: Bar chart over the top 10 deadliest terrorist groups.

Our objective was to discover the top 10 deadliest terrorist groups based on the total number of people killed. We collated the data by the terrorist group's name and calculated each group's total number of people killed.

The results display the top 10 deadliest terrorist groups along with their corresponding death tolls in a table. The top 3 deadliest groups were the Islamic State of Iraq and the Levant (ISIL), Taliban, and Boko Haram, with 38,923, 29,410, and 20,328 deaths, respectively.

4.4 Summary of the findings

4.4.1 Terrorism by Country

Our data analysis revealed that the countries with the most terrorism over the years include Afghanistan, Iraq, Nigeria, Pakistan, and Syria. In recent times (2012-2017), the top 10 countries with the most terrorism were Iraq, Afghanistan, Pakistan, India, the Philippines, Nigeria, Somalia, Yemen, Libya, and Syria. We also found that some countries, such as Russia, Algeria, and Sri Lanka, have experienced a reduction in terrorism in recent times.

4.4.2 Weapon Types And Terrorism

We found that the most common weapons in different regions were firearms or explosives. Furthermore, we observed that weapon types significantly impact fatalities, with firearms and explosives generally causing the highest number of deaths.

4.4.3 Terrorism Trends and Patterns

Our analysis revealed that 2014 was the worst year of terrorism, with the highest number of incidents and deaths. We also found that the number of deaths per attack varies by region, with some regions experiencing more fatalities per attack than others. Additionally, we identified the top 5 countries with the most deaths due to terrorism, namely Iraq, Afghanistan, Pakistan, Nigeria, and India. A comparative analysis of terrorism intensity in the top 5 countries and global patterns reveals that these countries account for a significant proportion of global terrorism-related fatalities.

4.4.4 Deadliest Terrorist Groups

Our analysis indicated that the deadliest terrorist groups were the Islamic State (IS) and the Taliban.

4.5 Explanation of the relevance of the findings to the research

Our research can provide a good overview and insight into the distribution and specifics of global terrorism. Geographical locations are highlighted, and different weapon types are looked at and analysed. We have also looked at specific terrorist groups and their history to better understand their potential for harm and

destruction.

The results we found align with our research goals, and our initial questions have been answered. In the next section, we will more closely discuss our findings and go into greater detail.

Chapter 5

Discussion

5.1 Introduction

This section aims to examine our research findings and provide an interpretation of what the graphs are telling us. This is important to understand if the findings are significant or purely superficial. We will also compare our findings with some previous studies in the field; those are outlined in the literature review section of the report.

5.2 Implications of the findings and their significance to the research

Our analysis of global terrorist attacks between 1970 and 2017 showed that the Middle East and North Africa experienced the highest number of attacks, followed by South Asia and Southeast Asia. Additionally, we found that explosives were the most commonly used weapon type, and firearms attacks were the most lethal. The Islamic State was the deadliest terrorist group during the period analysed, with attacks that resulted in over 30,000 deaths. Our comparative analysis of the top five countries with the most deaths and global patterns of terrorist attacks revealed that these countries were among the most dangerous in the world in terms of terrorism.

The significance of these findings could be considered superficial; many countries and terrorist groups receive media coverage which causes the results of some of the questions to be well-known. This, however, confirmed our initial assumptions of how considerable the amount of destruction global terrorism causes and where the hot zones for terrorism are. However, it provides a broad analysis of different

aspects of global terrorism.

5.3 Interpretation of the findings

Research questions and objectives are answered meaningfully by our findings. We have identified countries with the most terrorism over the years and those with the least terrorism recently. Furthermore, we found that weapon types have a significant impact on fatalities. In addition, our analysis of terrorism trends and patterns, as well as the deadliest terrorist groups, enables us to gain a better broad understanding of the evolving nature of terrorism.

5.4 Comparison of the findings to previous research and studies

In this study, we have compared our findings with previous research and studies related to global terrorism. Our research supports and builds upon previous studies in several key areas. For example, our analysis of terrorism by country aligns with the Global Terrorism Index 2022, which identifies the Middle East and North Africa as regions that experience a higher incidence of terrorism than other parts of the world. As the report states, "Over the past two decades, the Middle East and North Africa (MENA) region has consistently been the most impacted by terrorism, with thousands of attacks and tens of thousands of deaths" (Global Terrorism Index 2022, p. 15)[4]. Our findings corroborate this assessment and provide a more broad analysis of terrorism trends in different regions.

Additionally, our analysis of weapon types and their impact on terrorist attacks is consistent with prior research. As a study by the National Consortium for the Study of Terrorism and Responses to Terrorism (START) found, "attacks involving explosives caused more fatalities per incident and were responsible for more incidents causing five or more fatalities than any other weapon category" (LaFree et al., 2010, p. 20)[9]. Even though in 2017 firearms were slightly above explosives in the fatality rate, our study supports these findings and expands upon them by examining weapon use in different regions. Lastly, our analysis of the deadliest terrorist groups aligns with previous research that has identified ISIS and the Taliban as responsible for many terrorist attacks and fatalities (Global Terrorism Index 2022)[4]. Our study contributes to this body of research by providing an overview of the activities of these groups and their impact in different regions.

Our comparative analysis of our findings supports previous research and stud-

ies. It provides evidence of the impact terrorism had on different regions between 1970 - 2017 regarding fatalities and choice of weapons. Our study contributes to existing research by giving an understandable analysis of factors shaping terrorist activities.

5.5 Limitations of the research and how to address them

It is important to mention and acknowledge that our research has a few limitations. The analysis we did was based on the GTD database, and GTD has some limitations, such as missing values and data, and it takes events between 1970 - 2017 into consideration. Meaning that events before 1970 and after 2017 will not show in our findings. One should update the data set to address this limitation as terrorist events occur.

Secondly, our research was done using a quantitative data approach that will not consider the whole complexity of terrorism, for instance, poverty, political regime, religion or cultural aspects. Future research could combine qualitative data and quantitative data to gain more accurate and complete research on the whole aspect of terrorism.

As a last mention, our study does not look into specific factors that might increase or decrease terrorism in countries or regions. To address this limitation, future research should perform an in-depth, specific analysis to understand the unique aspects and factors that contribute to terrorism, paving the road for more effective counter-terrorism strategies.

5.6 Conclusion and recommendations for future research

As a result of our research, we found numeric values to visualise terrorism, which gave us a broad insight into terrorism, such as what kind of weapon types were used, the deadliest terrorist group, and what country had the highest numbers of deaths due to terrorism, to mention some of the answers we found, based on our questions.

The data set GTD only covers the years between 1970 and 2017, so it's critical for future studies that look into recent trends and patterns to have an updated

data set with data from after 2017. This will ensure the accuracy of the studies.

To achieve a more comprehensive understanding of terrorism. Gaining insight into human-driven aspects used by looking at numerical values is limited due to human factors, such as free will or being forced. Future research could combine qualitative data and quantitative data to gain more accurate and complete research on the whole aspect of terrorism.

Future research should be focused on in-depth and specific to a country or region.

Studies and research should investigate underlying factors contributing to change in terrorism in the different regions to help understand terrorism in each region and develop specific counter-terrorism policies within that region or those countries within the region to effectively combat terrorism.

Research into the effectiveness of different counter-terrorism strategies implemented by governments globally could lead to a more efficient and targeted counter-terrorism strategy.

Addressing the recommendations in future research will help to improve our understanding of terrorism and help develop more effective counter-terrorism strategies, reducing the effect of terrorism.

Chapter 6

Conclusion

6.1 Summary of the main work and findings

In conclusion, our research has provided insights into global terrorism. We have identified the top 10 countries with the highest number of terrorism events between 1970 and 2017, including Afghanistan, Iraq, Nigeria, Pakistan, and India while identifying the top 10 countries with the most terrorism between 2012 and 2017. Countries such as Russia, Algeria, and Sri Lanka have seen a reduction in terrorism during this period.

Our findings also reveal that explosives are the most commonly used weapon across various regions, with firearms and explosives being the primary contributors to fatalities. The year 2014 experienced the highest number of terrorism events, with a count of 16,903. South Vietnam has the highest number of deaths per attack, while Iraq leads in total fatalities, with 78,589 deaths. Furthermore, our comparative analysis of terrorism intensity highlights the differences between the top 5 countries and global patterns regarding event and fatality ratios. Lastly, we identified the deadliest terrorist groups as the Islamic State of Iraq and the Levant (ISIL), the Taliban, and Boko Haram, responsible for 38,923, 29,410, and 20,328 deaths, respectively. Overall, this study has helped us gain a broader understanding of global terrorism.

6.2 Implications of the findings for theory and practice

Implications of the findings, from a theoretical perspective, our findings are contributing to gaining a broad understanding of global terrorism. With the data we

analysed from the GTD, we figured out where it's most dangerous when discussing terrorism. (demonstrate the changing nature of terrorism and the importance of context-specific factors in understanding terrorist attacks.) We also had an analysis of weapons types and the deadliest terrorist groups that provided a deeper understanding of what weapons are preferred, what the different terrorist groups have access to, and the impact those weapons have in terrorist attacks.

In terms of practical implications, our research findings could help to inform early and possibly prevent how likely a region or country could be affected by a terrorist attack. Our findings can also help get a broader understanding of where in the world there is a high chance or low chance of terrorist attacks. Since we have used the GTD to identify the countries most affected by terrorism and identified what weapons are used, countries and regions can take preventive measures. For example, countries or regions where explosives are most common could increase mass casualty care. Another example is that where countries have most firearms used in terrorist attacks, they could increase the effort to further restrict or remove guns. Our analysis could also help to implement measures to help reduce deaths, by increasing measures to manage mass casualties, for instance, increased access to increased blood transfusion, increased helicopter access, and mass casualty vehicles.

Additionally, the analysis gave us information about the deadliest terrorist groups, this can be used to prioritise resources and intelligence efforts, ensuring that counterterrorist measures are directed towards the biggest threats. Lastly, the comparative analysis we made about terrorism intensity in the top five countries with the most deaths and the global pattern provides insight into the pattern for terrorism over time.

6.3 Recommendations for future research

Based on our findings, we have discovered several questions we did not answer and forms of analysis we did not conduct. Here are some of our recommendations for future research:

To better understand the cause and effects of terror, thoroughly analysing correlated factors is important. A long-term analysis could help better understand related factors and how they contribute to terrorism. Finding and gaining insight into correlations could also assist in the prediction of future trends and incidents.

A closer look at local context and how political, economic and ideological fac-

tors contribute to terrorism. Our research has done a broad analysis of global numbers and statistics with less focus on context-specific factors, even though they are extremely important and important in predicting future trends.

Our study focuses on quantitative analysis. There is value to be found in doing qualitative research. Interviewing people and affected communities could help understand motivations and local conditions and gain a deeper understanding of the cause and effects of terror.

Counter-terrorism strategies could be examined by their effectiveness in reducing terrorist attacks and their impacts on future research.

The use of new technologies, such as social media, encryption, and artificial intelligence in terrorism, should be explored further, and how terrorist organisations use them.

To better understand terrorist organisations' similarities and differences, future research could conduct more comparative analyses of different terrorist organisations.

With these recommendations, future research could gain a deeper and broader understanding of global terrorism.

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