

Analysis of the Global Terrorism Database from 1970 to 2020

Iraq

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Abstract

This project aims to analyze the various aspects of terrorist acts, focusing in particular on the instruments used and the objectives.

RStudio was used for data analysis with the following libraries: `tidyverse` for data manipulation and visualization, `readxl` for importing data from Excel, `ggplot2` for creating high-quality graphs, `gridExtra` for combining multiple graphs, and `plotrix` for specialized graphs not available in other libraries.

The dataset used is the Global Terrorism Database (GTD), released by a Department of Homeland Security Emeritus Center of Excellence led by the University of Maryland.

1 Introduction

The Global Terrorism Database (GTD) is a comprehensive dataset on terrorist events worldwide. It is maintained by the National Consortium for the Study of Terrorism and Responses to Terrorism (START) at the University of Maryland. The GTD includes information on more than 200,000 terrorist incidents from 1970 onwards.

2 Data Import and Selection

The data obtained from the University of Maryland are protected and cannot be shared; therefore, registration on the portal was required to access them. After retrieving the database, an analysis showed that it contained **209,706 rows and 135 columns**. For graphical purposes, the dataset was filtered to include only events that occurred in Iraq.

The columns refer to different and essential values:

- **GTD ID** (dbl): Event ID
- **iyear** (dbl): Reference year
- **imonth** (dbl): Reference month
- **iday** (dbl): Reference day
- **extended** (dbl): Whether the event lasted more than 24 hours
- **resolution** (chr): Whether the event was resolved after 24 hours
- **summary** (chr): Event description
- **crit1** (num):
 - 1: Political, economic, religious, or social event
 - 2: Coercion or intimidation
 - 3: Outside international law
- **doubtterr** (num):
 - 1: If there is doubt it is a terrorist act
 - 0: Otherwise

- **alternative** (num): Linked to *doubtterr*
 - 1: Insurgency/guerrilla
 - 2: Other crime
 - 3: Intra-/inter-group conflict
 - 4: Unintentional
 - 5: State
- **country** (num): Event location (country)
- **region** (num): Event region (12 categories)
- **provstate** (chr): Province or state
- **city** (chr): City
- **attacktype_1** (num): General method of the attack
 - Assassination
 - Hijacking
 - Kidnapping
 - Barricade incident
 - Bombing
 - Armed assault
 - Unarmed assault
 - Infrastructure attack
 - Unknown
- **attacktype_2 / attacktype_3** (num): Specific method of the attack
- **attacktype_{1,2,3}_txt** (chr): Literal description of the attack type
- **success** (num): Whether the event ended successfully
- **suicide** (num): Whether the perpetrator intended to survive the event
- **weaptype1** (num): Type of weapon used
- **weapsubtype** (chr): Subtype of the weapon
- **property** (num):
 - 1: If there is evidence of property damage caused by the incident
 - 0: Otherwise
- **provalue** (num): Value in USD of the damages caused by the incident
- **gname** (chr): Name of the group
- **nkill** (num): Number of fatalities
- **nwound** (num): Number of wounded

3 Data Analysis

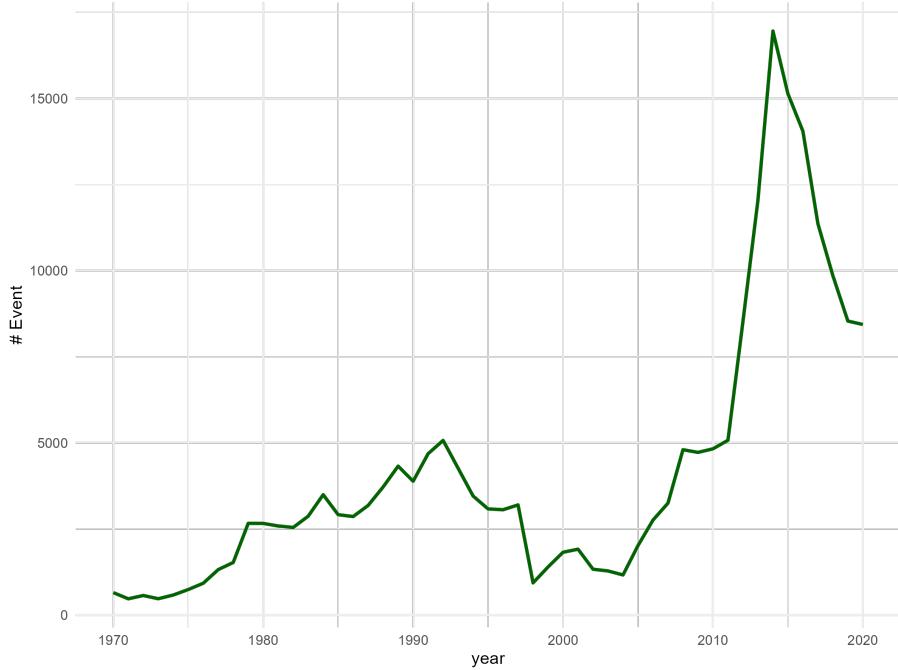
This section focuses on the graphical analysis of the data, comparing global events with those that occurred in Iraq. This approach makes it possible to evaluate how the data evolve depending on the country and how Iraq has behaved in such situations, with particular attention to the groups responsible for the attacks, the number of fatalities, the number of wounded, the damage caused to structures, and the success rate of the attacks.

Some data are, of course, missing, and certain columns are categorized as “unknown.” This is due to the fact that attacks are often not claimed or not properly digitized. Nevertheless, they are included in the graphs in order to correctly assess the overall trend.

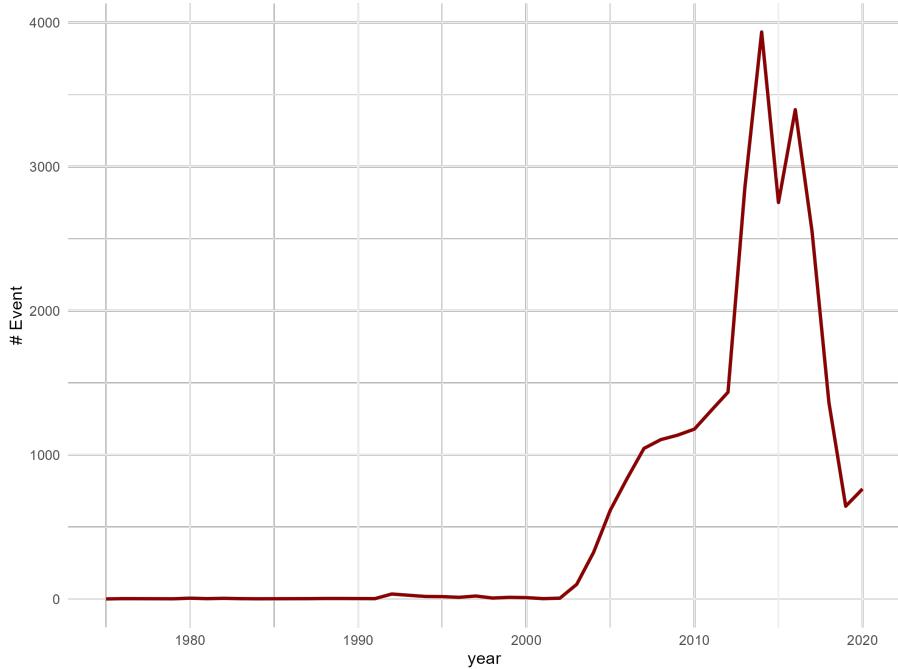
3.1 Event trends

This section presents a graphical analysis of the number of events that occurred worldwide and in Iraq between 1970 and 2020 (verified dates). Figure 1a shows that during the 1990s, and more significantly between 2010 and 2020, the number of events increased substantially, reaching a peak around 2015. In contrast, Figure 1b, which focuses on events in Iraq, highlights a peak of approximately 4000 events between 2010 and 2020.

Global events were mainly characterized by terrorist attacks carried out by ISIS and the Taliban (further illustrated in a later figure), whereas events in the most affected countries, such as Iraq, were predominantly linked to Al-Qaeda in Iraq (AQI), ISIL, and other local jihadist groups that emerged during the post-2003 conflict period.



(a) Global events between 1970 and 2020



(b) Events in Iraq between 1970 and 2020

Figure 1: Comparison between global terrorist attacks and those in Iraq from 1970 to 2020.

3.2 Events Trend and Groups

Figure 2 shows the ten most targeted countries, and each horizontal bar is divided according to the group responsible for the attack. As previously defined, many attacks are labeled as "unknown"; this can occur when an attack is not claimed or when there is insufficient information to determine who carried it out.

Obviously, for a thorough analysis it would be important to also consider these cases, but given the quantitative level of this analysis, we rely on the numbers provided by the GTD.

The most targeted country is **Iraq**, which has experienced numerous terrorist attacks due to the chaos and political instability following the 2003 invasion, which led to the overthrow of Saddam Hussein's regime and a prolonged civil war.

The foreign occupation and the consequent strengthening of Shia and Kurdish communities fueled discontent and nationalism, particularly among Sunnis. This context favored the emergence and growth of extremist groups such as Al-Qaeda in Iraq (AQI), which, exploiting sectarian tensions, intensified attacks, including against Shia civilians. As a result, jihadist terrorism in the country and the region increased significantly.

The main group responsible in Iraq is ISIL, which is essentially a fusion of AQI, Syrian jihadist groups, and local alliances, and later created international branches to expand its influence.

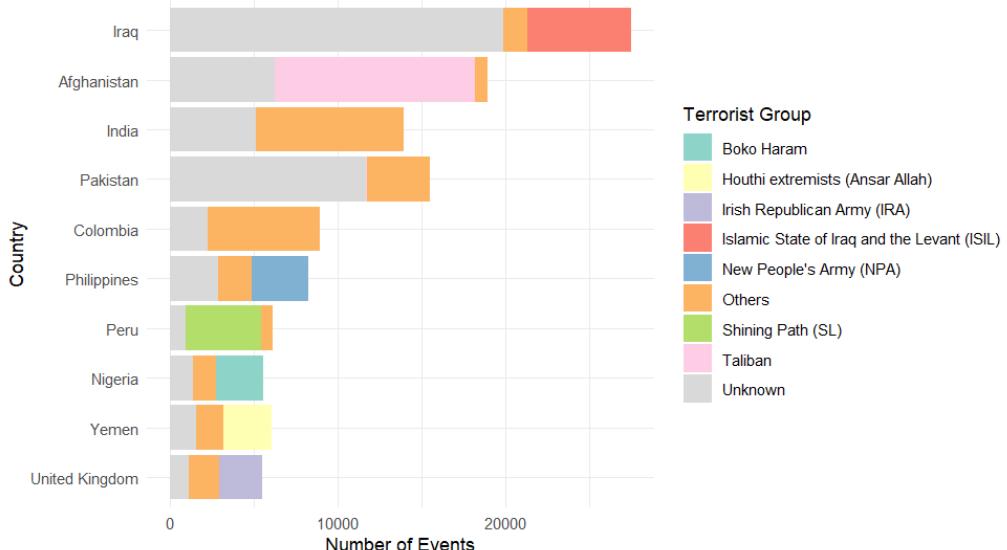


Figure 2: Events and groups responsible

3.2.1 Top Terrorist Groups in Iraq

Figure 3 presents a comparative bar plot of the main terrorist groups operating in Iraq, showing the number of events, fatalities, and injuries attributed to each group.

The results highlight the predominant role of the **Islamic State of Iraq and the Levant (ISIL)**, which is responsible for the largest share of attacks, as well as the highest number of deaths and injuries. **Al-Qaida in Iraq** and its successor, the **Islamic State of Iraq (ISI)**, also represent significant contributors, reflecting the historical evolution of jihadist organizations in the region.

Other groups such as **Tawhid and Jihad**, **Kata'ib Hezbollah**, and smaller factions (e.g., **Ansar al-Islam**, **Mahdi Army**, and **Kurdistan Workers' Party**) appear in the chart, but their impact is considerably lower compared to ISIL.

This distribution demonstrates that terrorism in Iraq has been highly concentrated in a limited number of organizations, with ISIL overwhelmingly dominating both in terms of operational frequency and the scale of human casualties.

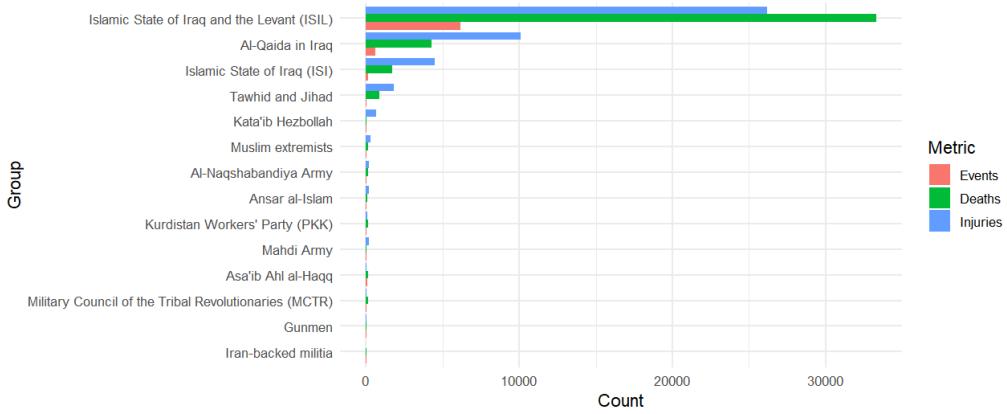


Figure 3: Comparative bar plot of the top terrorist groups in Iraq (events, deaths, and injuries).

3.3 Events in the Main Cities of Iraq

After analyzing the ten most affected countries and categorizing them according to the groups responsible, we now focus on Iraq, with particular attention to the cities that experienced more than 200 events.

3.3.1 Baghdad

As can be seen in the first column of Figure 4, the capital of Iraq, **Baghdad**, has been the primary target for several reasons:

- **Strategic and geopolitical role:** As the capital, Baghdad represents the nerve center of Iraqi power, located in a region with significant resources and a long history of foreign interventions.
- **Political instability:** The war and subsequent occupations, such as the 2003 invasion, deeply destabilized the country, leading to rebellions, insurgencies, and conflicts among different factions.
- **Presence of extremist groups:** The rise of terrorist organizations such as the *Islamic State (ISIS/ISIL)* caused numerous attacks aimed at undermining the government and spreading terror among the population.
- **Dynamics of retaliation:** Many violent actions were carried out as responses to previous attacks, serving both as demonstrations of strength and attempts to assert territorial control.
- **Weakness of occupying forces:** After the 2003 invasion, security services were unable to provide adequate protection and stability, fueling discontent, mistrust, and further attacks.

3.3.2 Mosul

Another heavily affected city was **Mosul**, which between 2016 and 2017 became the stage of the *Battle of Mosul*, one of the most intense urban conflicts of the 21st century. The battle involved:

- approximately **20,000 Islamic State (ISIS/ISIL) fighters**;
- between **90,000 and 100,000 combatants from Iraqi government forces**, supported by the **Kurdish Peshmerga** and the **International Anti-ISIS Coalition**, composed of both Western and regional countries.

The battle ended in July 2017 with the victory of the government forces and the coalition, leading to the **liberation of Mosul**. However, the human and material cost was immense: thousands of civilian casualties, massive destruction of urban infrastructure, and a humanitarian crisis that profoundly marked both the city and Iraq as a whole.

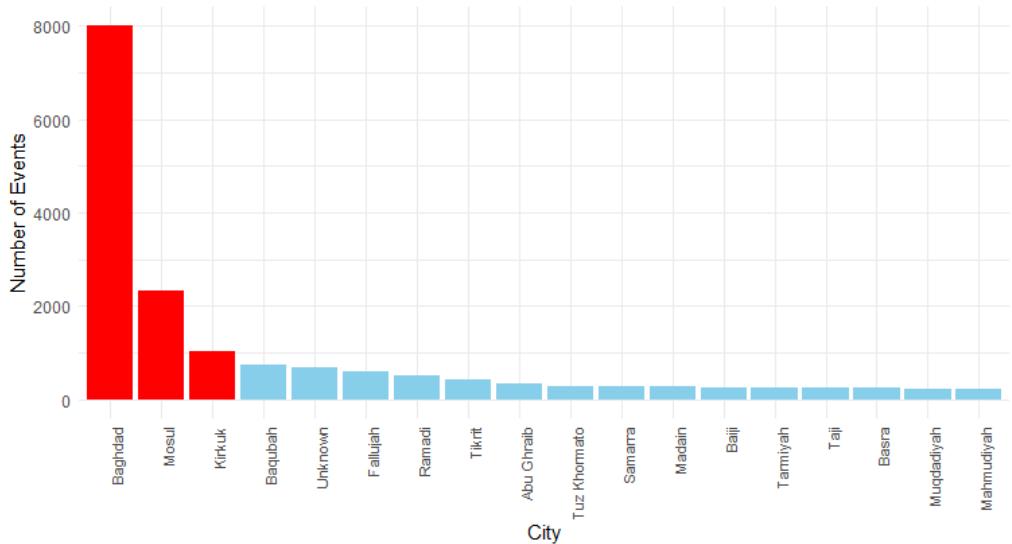


Figure 4: Events in the Main Cities of Iraq

3.4 Targets of Attacks in Iraq

Over the years, attacks in Iraq have been directed towards different targets. The main categories identified are: civilians and private property, military forces, police forces, government structures, and economic or business-related facilities. According to the *codebook* developed by the University of Maryland, which specifies the coding criteria for each field, these categories are defined as follows:

- **Civilians and property:** attacks against individuals in public spaces or gathering areas, such as markets, streets, and intersections. This category also includes attacks against students.
- **Military:** attacks targeting units, patrols, checkpoints, convoys, or any other component of the armed forces.
- **Police:** attacks against police members, mobile posts, prisons or detention facilities, as well as prison staff and guards.
- **Government structures:** attacks against government buildings, members (and former members) of government or political parties in their official capacity, their convoys, or political events sponsored by parties.
- **Economic and business facilities:** attacks against company offices, enterprises (such as mining or oil companies), entrepreneurs, and business executives. This category also includes hospitals, chambers of commerce, and cooperatives.

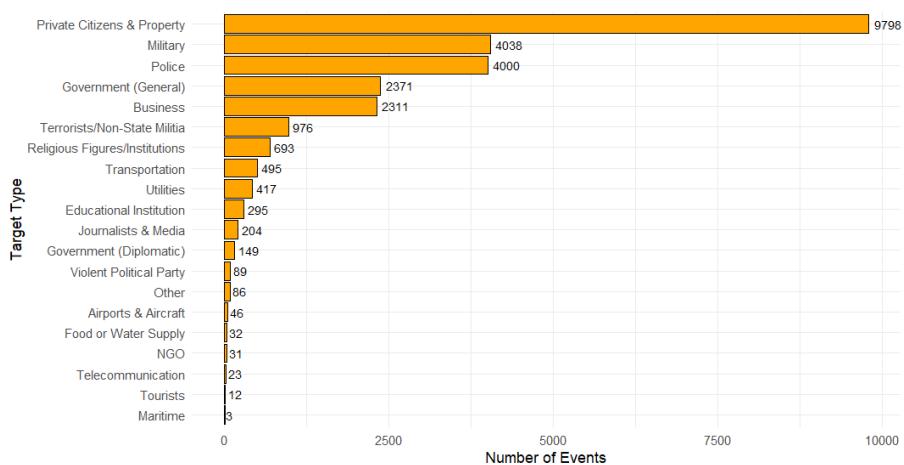


Figure 5: Targets of attacks in Iraq

3.5 Type of weapons used in attacks in Iraq

This section explains why between 2010 and 2020 there were mainly explosive attacks. This phenomenon can be explained by several historical, political, and tactical factors:

- **Invasion and occupation of Iraq (2003):** After the U.S.-led intervention that toppled Saddam Hussein, the country entered a period of severe political and institutional instability. This created a fertile ground for insurgent and terrorist groups.
- **Insurgency and sectarian war (2004–2011):** Many armed groups (Sunni, Shia, and jihadi, including *al-Qaida in Iraq*) relied heavily on **improvised explosive devices (IEDs)**, car bombs, and suicide attacks as their main tactics. Explosives were cheap, relatively easy to produce, and highly effective at generating fear and destabilization.
- **Rise of ISIS (from 2013 onward):** The Islamic State fueled a new peak of explosive attacks, especially between 2014 and 2017, when it controlled large areas of the country and carried out thousands of bombings against markets, mosques, government offices, and military targets.
- **Characteristics of explosives as weapons:**
 - Easy to hide and transport.
 - Capable of hitting crowded civilian targets, causing mass casualties.
 - Allow small groups with limited resources to conduct impactful operations.

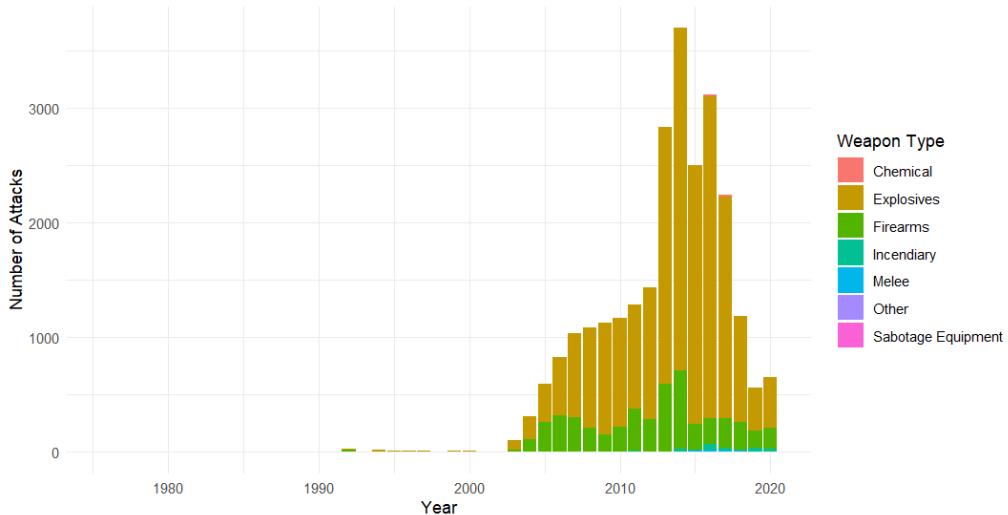


Figure 6: Weapon Type

3.6 Attack Types and Success Rates

Another relevant aspect that can be analyzed in the GTD is the relationship between the type of attack and the assessment of its level of success. According to the codebook, the success of a terrorist attack is defined on the basis of its tangible effects, without considering the broader political or strategic goals of the perpetrators. For example, a bomb that detonates inside a building is classified as a successful attack, even if it does not cause the building to collapse or trigger governmental repression.

As shown in the figure, the majority of attacks were successful, which explains the high number of fatalities and injuries reported. An important observation concerns assassinations: the rate of failed attempts is close to the rate of successful ones, due to the fact that it is often difficult, if not impossible, to eliminate the intended target.

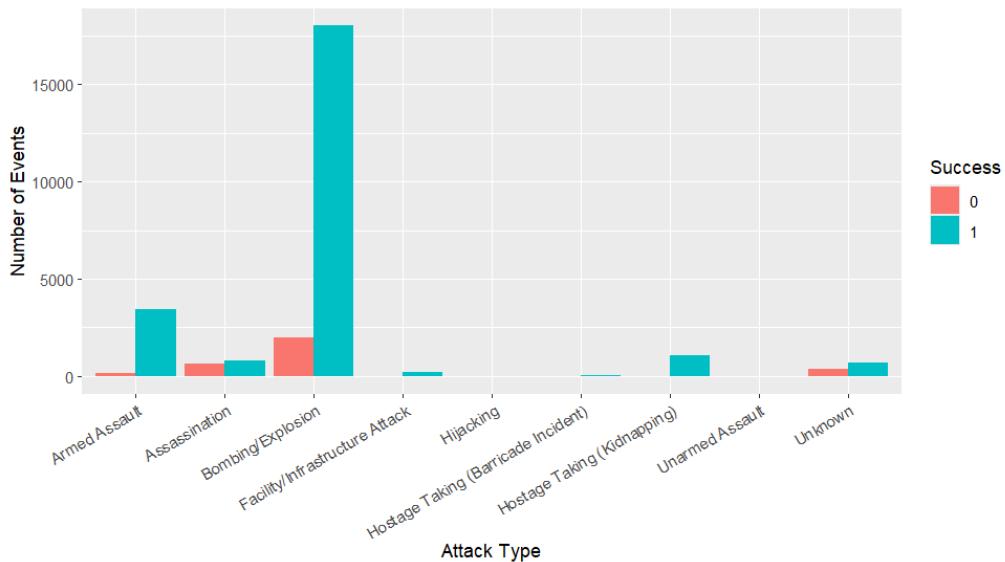


Figure 7: Attack types and corresponding success rates in Iraq

4 Conclusion

The analysis of the GTD shows how wars and extremist movements seeking to impose their ideology inevitably lead to destruction and human suffering. In the case of Iraq, the focus of this study, the dataset records **81,675 deaths** and **139,428 injuries**, while other estimates indicate a total toll ranging between **200,000** and **300,000 victims**.

These figures highlight the devastating impact of terrorism and armed conflicts on the country, fueling political instability, social divisions, and persistent suffering. Violence of this magnitude not only undermines immediate security but also hampers the prospects for peace and development in affected communities.

The GTD represents a valuable resource for studying these phenomena, allowing the reconstruction of historical trends and operational dynamics of terrorist groups. Furthermore, its dissemination can play an educational and awareness-raising role, particularly among younger generations, making the human cost of radical ideologies and conflicts tangible.

Data Sources

- START (National Consortium for the Study of Terrorism and Responses to Terrorism). (2022). *Global Terrorism Database, 1970 - 2020* [data file]. <https://www.start.umd.edu/gtd>
- **Iraq Body Count Project.** Iraq Civilian Deaths Database. <https://www.iraqbodycount.org/>