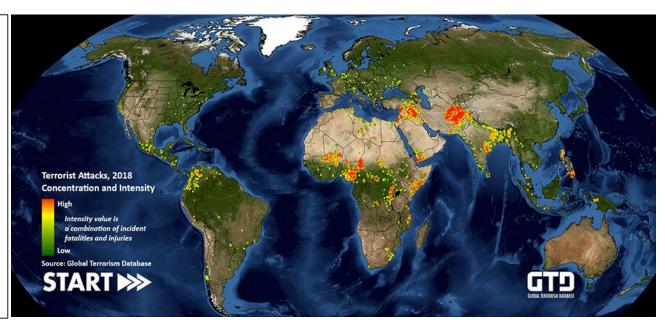# Exploratory Data Analysis
# of Global Terrorism Database
Capstone Project

Team DataZoids

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Terrorist Attacks, 2018
Concentration and Intensity

High

Intensity value is a combination of incident fatalities and injuries

Low

Source: Global Terrorism Database

START ▶▶▶
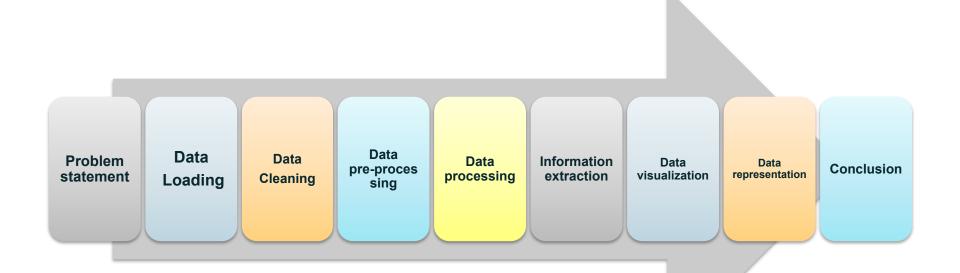
GTD
GLOBAL TERRORISM DATABASE

AI

Problem Statement:

The Global Terrorism Database (GTD) is an open-source database including information on terrorist attacks around the world from 1970 through 2017. The GTD includes systematic data on domestic as well as international terrorist incidents that have occurred during this time period and now includes more than 180,000 attacks. Data provided here is big source of record of continuous terrorist activities. Here we have to provide a helpful data analysis for having multilateral initiatives in response to terrorism. The following points are some major questions which we need to Consider for Exploratory Analysis :

Flow of python coding for EDA:

AI

| Problem statement | Data Loading | Data Cleaning | Data pre-processing | Data processing | Information extraction | Data visualization | Data representation | Conclusion |

Explore : Travel through (an unfamiliar area) in order to learn about it.
What is a single most important task for an explorer ? " When you travel into unknown lands to discover new part of the world, it is to ensure records of your discoveries are delivered back safe and sound, with or without you. Otherwise, it is all vein" An intriguing line from a Netflix movie 'Against the ice'

Flow of GTD Analysis:

AI

★ **Global Terrorism Overview**

    ★ World Map showing number of attacks in different parts of world

    ★ Year on year trend of Reported Terrorist Attacks.
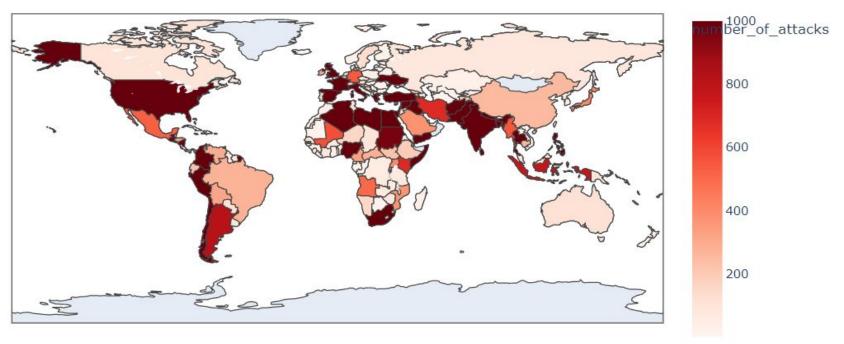
★ **Geographical Region Overview**

    ★ Regional overview of reported attacks

    ★ Year-on-Year trend of reported attacks in different regions

    ★ Summary of killings by terrorist in different regions

★ **Country Wise Overview**

    ★ Top countries with reported attacks

    ★ Top countries with reported killings

★ **Target Group wise Overview**

★ **Terrorist Organization wise Overview**

★ **Deep Dive into Types of Attacks and Weapons used**

Global Terrorism
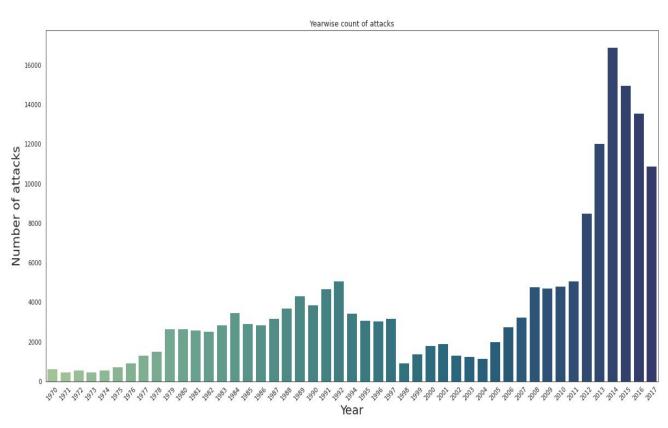
Today we are facing a terrorism all over the world and this problem increase day by day , Many of people lose their life , loved ones and their properties. Terrorism is a world-wide problem, and many countries want a data that provide the complete records of these activities take place so that they can take measures for controlling these activities .

Let's study the data provided to us which consist huge amount of information about global terrorism and try to find out cause and the remedies for this problem.

let's get started...

Year On Year plot of reported Terrorist Attacks:

It is evident from plot 2014 has been the worst affected year in terms of number of attacks and after that we are seeing gradual decline in coming years. From year 1997 to 1998 number of attacks reduced by almost 1/3rd and attack counts were on nearly flat trend till 2004. 2004 onwards we see significant increase in terrorist activities

Yearwise count of attacks

Geographical regions wise terrorism analysis: AI
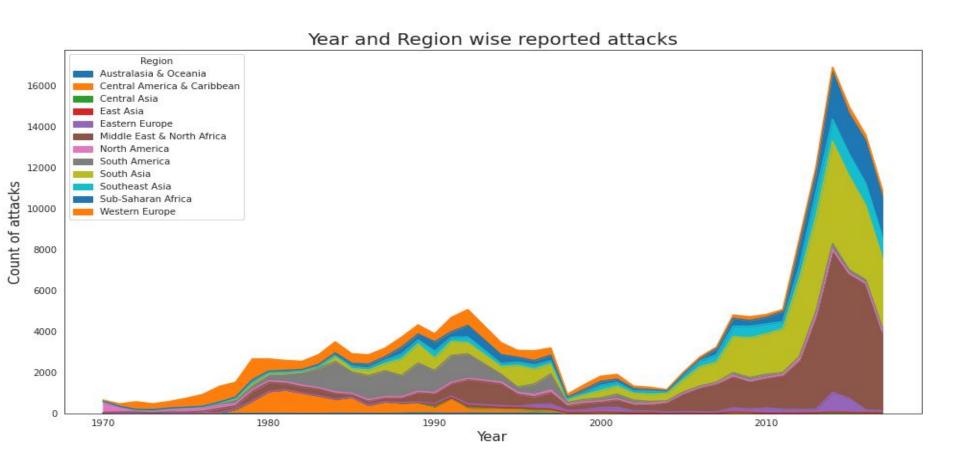
Name of region	Number of attacks
Middle East & North Africa	50474
South Asia	44974
South America	18978
Sub-Saharan Africa	17550
Western Europe	16639
Southeast Asia	12485
Central America & Caribbean	10344
Eastern Europe	5144
North America	3456
East Asia	802
Central Asia	563
Australasia & Oceania	282

❑ 'Middle east & North Africa' is the most attacked region contributing **27.78%** of reported events and **33.42%** of reported killings

❑ South Asia' is 2nd most attacked region contributing **24.75%** of reported events and **24.6%** of reported killings
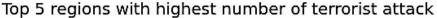
Geographical regions wise Terrorist Activity:

Year and Region wise reported attacks
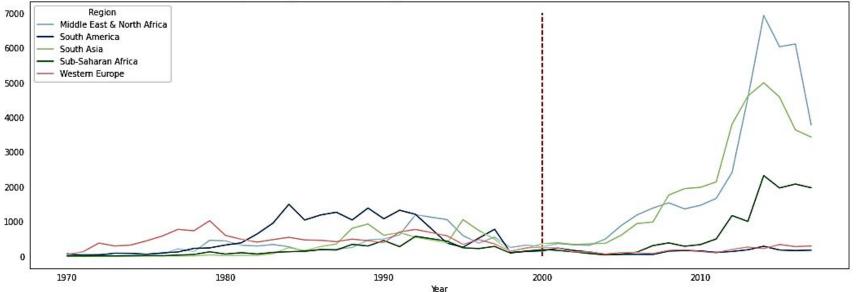
YoY trend of attacks on Top Five Regions

Top 5 regions with highest number of terrorist attack
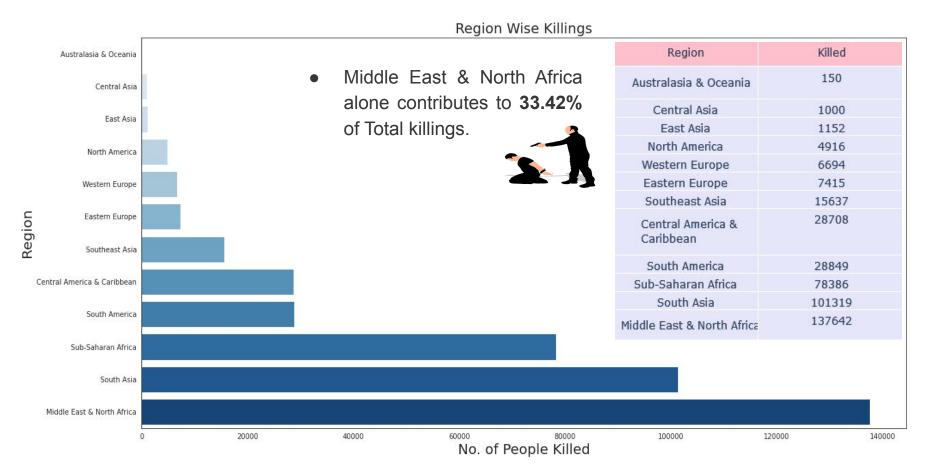
❑ From 1970s to early 2000s south America and western Europe were on higher for reported attacks however, after 2000s we see these 2 countries with very low reported attacks.

❑ Post 2000s till 2017 we see tremendous increase in terrorist activities in 'Middle east & North Africa', 'South Asia' and Sub-Saharan Africa'

Region wise reported killings:

Region Wise Killings

- Middle East & North Africa alone contributes to **33.42%** of Total killings.

Region	Killed
Australasia & Oceania	150
Central Asia	1000
East Asia	1152
North America	4916
Western Europe	6694
Eastern Europe	7415
Southeast Asia	15637
Central America & Caribbean	28708
South America	28849
Sub-Saharan Africa	78386
South Asia	101319
Middle East & North Africa	137642

Country wise terrorism :
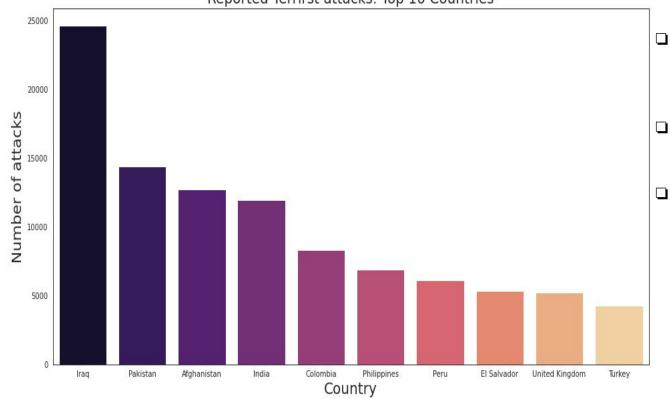
- ❏ Wordcloud is visual representation of the most frequent occuring country name in global database according to their relative size.
- ❏ With a single glance at this wordcloud we can tell country names where highest frequency of terrorism is.. such Iraq, Afghanistan, Pakistan, so on…

Top 10 countries with terrorist activities:

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Reported Terrirst attacks: Top 10 Countries
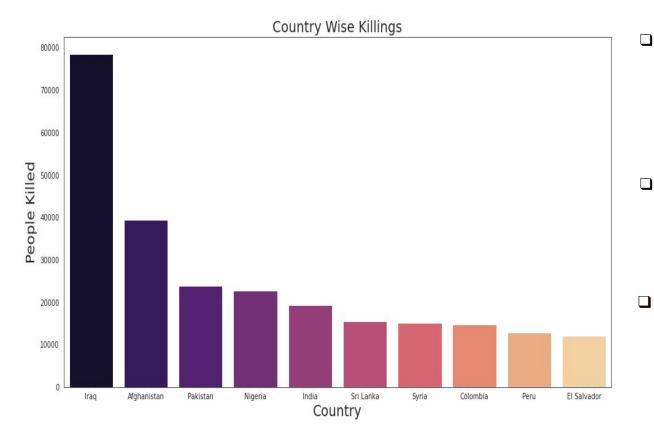
❏ We conclude that Iraq is most terrorist active having maximum number **24636** of attacks take place.

❏ Pakistan is second having **14368** followed by Afghanistan having **12731** number of attacks

❏ India is at fourth position in the world terrorist activities having **11960** number of attack.

Countries having maximum killing:

Country Wise Killings
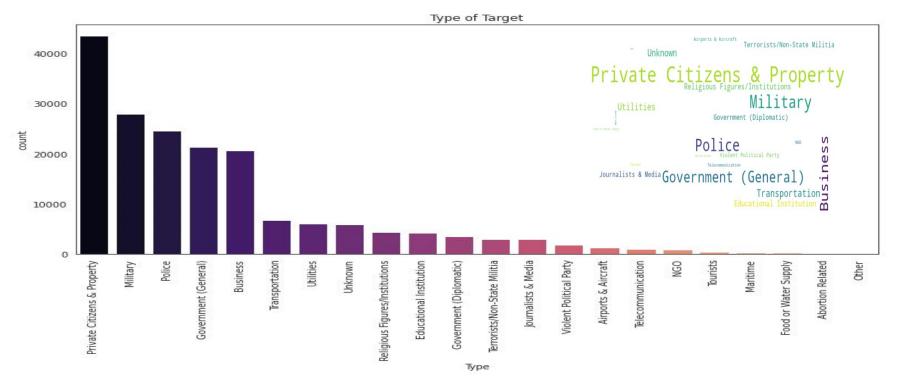
- ❑ Philippines, United Kingdom , Turkey these are 3 countries are in top 10 attacked countries, these countries are not in top 10 count of killings.
- ❑ Though Nigeria is not in top 10 attacked countries, But it is 4th highest country with reported killings.
- ❑ Out of 205 countries , Iraq contributes to **19.08%** of overall killings.

Target by Terrorists

Type of Target
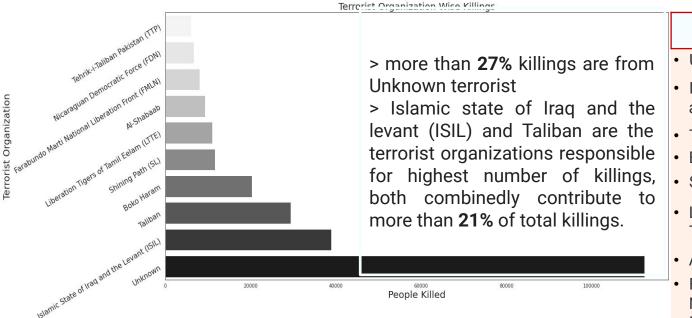
From above plot we can see Private Citizens & properties, Military and Police are the top 3 obvious targets by terrorists

Terrorist organization wise killings

Terrorist Organization Wise Killings

> more than **27%** killings are from Unknown terrorist
> Islamic state of Iraq and the levant (ISIL) and Taliban are the terrorist organizations responsible for highest number of killings, both combinedly contribute to more than **21%** of total killings.

Terrorist Group	Killed
• Unknown	112367
• Islamic State of Iraq and the Levant (ISIL)	38923
• Taliban	29410
• Boko Haram	20328
• Shining Path (SL)	11601
• Liberation Tigers of Tamil Eelam (LTTE)	10989
• Al-Shabaab	9330
• Farabundo Marti National Liberation Front (FMLN)	8065
• Nicaraguan Democratic Force (FDN)	6662
• Tehrik-i-Taliban Pakistan (TTP)	6042

❑ Known Terrorist Organizations **3536** apart from Unknown ones
❑ Unknown are possibly attacks which are not claimed by any Terrorist organization or Individual.
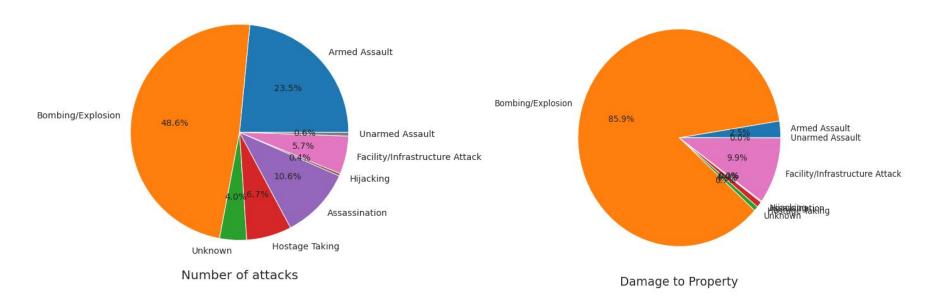
YoY trend of Various Types of Attacks

AI

❑ Observations from year-on-year trend of killings from various types of attacks.

❑ Before 2000–2002, Armed assault was prominent reason for death of people, 2003 onwards Bombing/Explosion became the top reason for death.

❑ During 2000 to 2002 death due to hijacking were at <u>peak</u>.
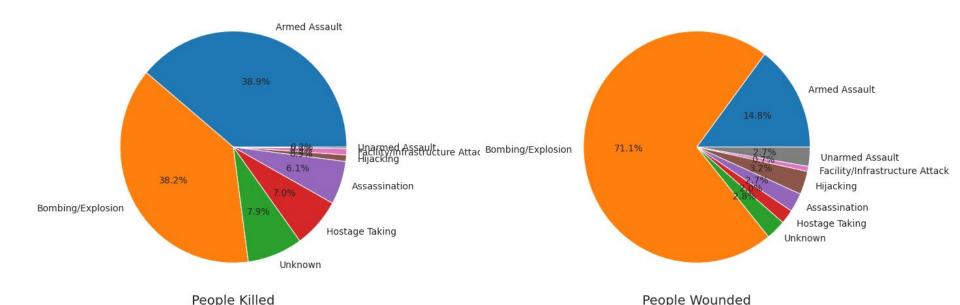
Reported Events and Property Damage by various Attacks

AI

Number of attacks

Damage to Property

- **Number of attacks: From** above graph it very evident almost half of attacks are <u>Bombing and explosion</u> types, followed by armed assault and assassinations in 2nd and 3rd place respectively
- **Damage to Property** : Almost **86%** of property damages are due to bombing and explosions. Total value of property damages is **USD 8.14** billion i.e., **INR 637.3** billion

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Casualties from various Attacks:
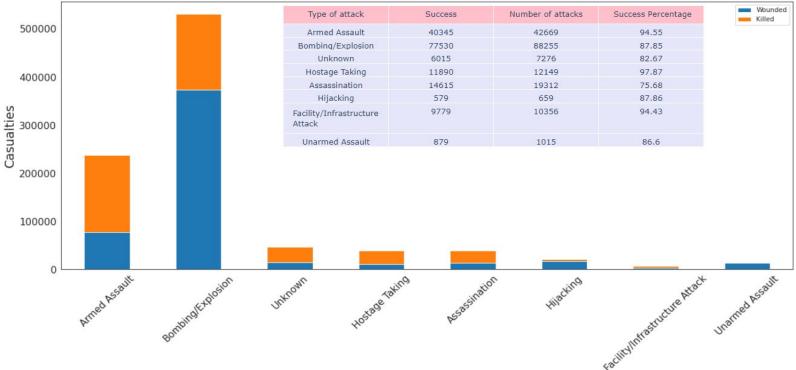
Killed: Armed assaults and Bombing/Explosions each of these is responsible for more than **38%** of reported killings

Wounded : Most Wounded type of casualties are due to bombing which is more than **71%** of total reported numbers

Types of attacks- Success rate and casualty ratios

Type of attack	Success	Number of attacks	Success Percentage
Armed Assault	40345	42669	94.55
Bombing/Explosion	77530	88255	87.85
Unknown	6015	7276	82.67
Hostage Taking	11890	12149	97.87
Assassination	14615	19312	75.68
Hijacking	579	659	87.86
Facility/Infrastructure Attack	9779	10356	94.43
Unarmed Assault	879	1015	86.6

- **Hostage Taking, Armed Assault and Facility/Infrastructure Attack have highest success percentage.**

- **Armed assault - Killing : Wounded Ratio = ~ 2 : 1**

- **Bombing/Explosion -   Killing : Wounded Ratio = ~ 1 : 2.5**

HeatMap: Type of attack vs Weapons

heatmap of attack type and weapons used

weapsubtype	Armed Assault	Assassination	Bombing/Explosion	Facility/Infrastructure Attack	Hijacking	Hostage Taking	Unarmed Assault	Unknown
Arson/Fire	3.1e+02	17	45	3.6e+03	13	1.4e+02	32	0
Automatic or Semi-Automatic Rifle	1.3e+04	2.7e+03	5.4e+02	3.7e+02	62	9.5e+02	0	0
Blunt Object	46	30	2	91	3	31	3.8e+02	0
Dynamite/TNT	3	21	1.2e+03	0	3	8	0	0
Explosive	0	0	64	1	0	0	0	0
Gasoline or Alcohol	84	22	71	6.5e+02	4	15	2	0
Grenade	4.6e+02	2.7e+02	4.4e+03	1	23	48	0	0
Handgun	1.9e+03	4e+03	30	29	79	5.8e+02	0	0
Hands, Feet, Fists	15	40	1	2	1	61	1.1e+02	0
Knife or Other Sharp Object	1.4e+03	6.7e+02	3	18	28	4.2e+02	1	1
Landmine	8	1.7e+02	4.1e+03	0	0	7	0	0
Letter Bomb	0	2.1e+02	3.4e+02	0	0	0	0	0
Molotov Cocktail/Petrol Bomb	2.8e+02	12	45	8.9e+02	1	2	2	0
Other Explosive Type	52	2.7e+02	7e+03	0	2	14	1	0
Other Gun Type	67	8	3	5	2	1	0	0
Pipe Bomb	6	5	6.1e+02	0	1	1	0	0
Poisoning	0	9	0	7	0	1	66	0
Pressure Trigger	1	2	2.2e+02	0	0	0	0	0
Projectile (rockets, mortars, RPGs, etc.)	1.3e+03	1.3e+02	8.3e+03	1	5	87	0	0
Remote Trigger	2	1.3e+02	2.6e+03	0	1	3	0	0
Rifle/Shotgun (non-automatic)	7.4e+02	3.1e+02	20	26	7	71	0	0
Rope or Other Strangling Device	2	36	0	0	1	46	18	0
Sticky Bomb	0	1.8e+02	1.4e+03	0	0	0	0	0
Suffocation	0	5	0	0	0	1	4	0
Suicide (carried bodily by human being)	5	1.5e+02	3.1e+03	0	4	37	0	0
Time Fuse	1	10	7.8e+02	0	0	0	0	0
Unknown	1.7e+03	1.6e+03	4.8e+02	4e+03	1.9e+02	5.2e+03	3.4e+02	7.3e+03
Unknown Explosive Type	1.4e+02	1.2e+03	4.4e+04	2	25	98	0	0
Unknown Gun Type	2.1e+04	6.5e+03	1.6e+02	7.1e+02	2e+02	4.3e+03	0	7
Unknown Weapon Type	2	5	0	6	0	35	59	0
Vehicle	0	5e+02	9.3e+03	0	7	55	0	0

Type_Of_Attack

Casualties from Different type of attacks & weapons

Killings

Wounded

Conclusions:

- ❏ 'Middle east & North Africa' is the most attacked region contributing **27.78%** of reported events and **33.42%** of reported killings

- ❏ From 'Middle east & North Africa' as well as world 'Iraq' is most attacked country contributing **13.55%** of reported events and **19.08%** of reported killings globally

- ❏ 'Iraq' alone contributes to **48.8%** events and **57.1%** killings reported out of 23 countries in 'Middle east & North Africa'**

- ❏ Contradictory observations : Philippines, United Kingdom , Turkey these are 3 countries though in top 10 attacked countries, these countries are not in top 10 in terms of killings.

- ❏ Nigeria, Sri Lanka, Syria though not in top 10 attacked countries, these are 4th, 6th and 7th highest countries with reported killings.

- ❏ Private Citizens & properties, Military and Police are the top 3 favorite targets by terrorists

- ❏ Excluding Unknown terrorists there 19 large terrorist organizations that launched more than 1,000 terrorist attacks. 32 terrorist organizations exceeded 500 attacks, and 122 terrorist organizations exceeded 100 attacks. These 122 terrorist organizations launched 78,107 terrorist attacks, accounting for more than 79% of all known terrorist group incidents.

- ❏ Apart from **3536** known terrorist organizations more than **27%** killings are from Unknown terrorist organizations / individuals which is **big concern.**

- ❏ After the Unknown type of attacker's Islamic state of Iraq and the levant (ISIL) and Taliban are the terrorist organizations responsible for highest number of killings, both combinedly contribute to more than **16.5%** of total killings

<u>Conclusions</u>:

AI

Summary of destructions caused by Bombing/Explosion

- ❏ **48.6%** of total events
- ❏ **85.6%** of total property damages
- ❏ **38.2%** of total killing
- ❏ **71.1%** of total wounded type casualties
- ❏ 'Vehicle, 'Unknown Explosive Type' and 'Suicide(carried bodiyly by human beings)' , 'Projectile (rockets, mortars, RPGs etc.)' prominent types of Bombing/Explosions

Summary of destructions caused by Armed Assault

- ❏ **23.5%** of total events
- ❏ **38.9%** of total killing
- ❏ **14.8%** of total wounded type casualties
- ❏ 'Unknown Gun Type' and 'Automatic or Semi-Automatic Rifle' prominent types of weapons used for Armed Assaults

Thank you