Global Terrorism Database

Data Analysis

AYUSH KAWALE

About the Project

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 duringthis time period and now includes more than 180,000 attacks.
The database is maintained by researchers at the National Consortium for the Study of Terrorism and Responses to Terrorism (START), headquartered at the University of Maryland.

We will select a subset of the data suitable for our analysis and analyze terror activity across the global levelas well as for India.

TOOLS :-

We will use Python in Jupyter Notebooks for importing, preparing and cleaning the data.

We will also perform Exploratory Data Analysis in Pythonand then visualize the data exported from python in Power BI to gather insights.

Key Insights

- The period from 2000 to 2014 witnessed a significant increase in terrorist activity, contrasting with the preceding decade's slight decline in 1990s, despite heightened security measures.

- The majority of these incidents are concentrated in the Middle East, North Africa, and South Asia.

- Over a 25-year span, Iraq endured more than 20,000 terror attacks, averaging more than 2 attacks per day.

- Private citizens are the primary targets of these attacks, followed by military personnel.

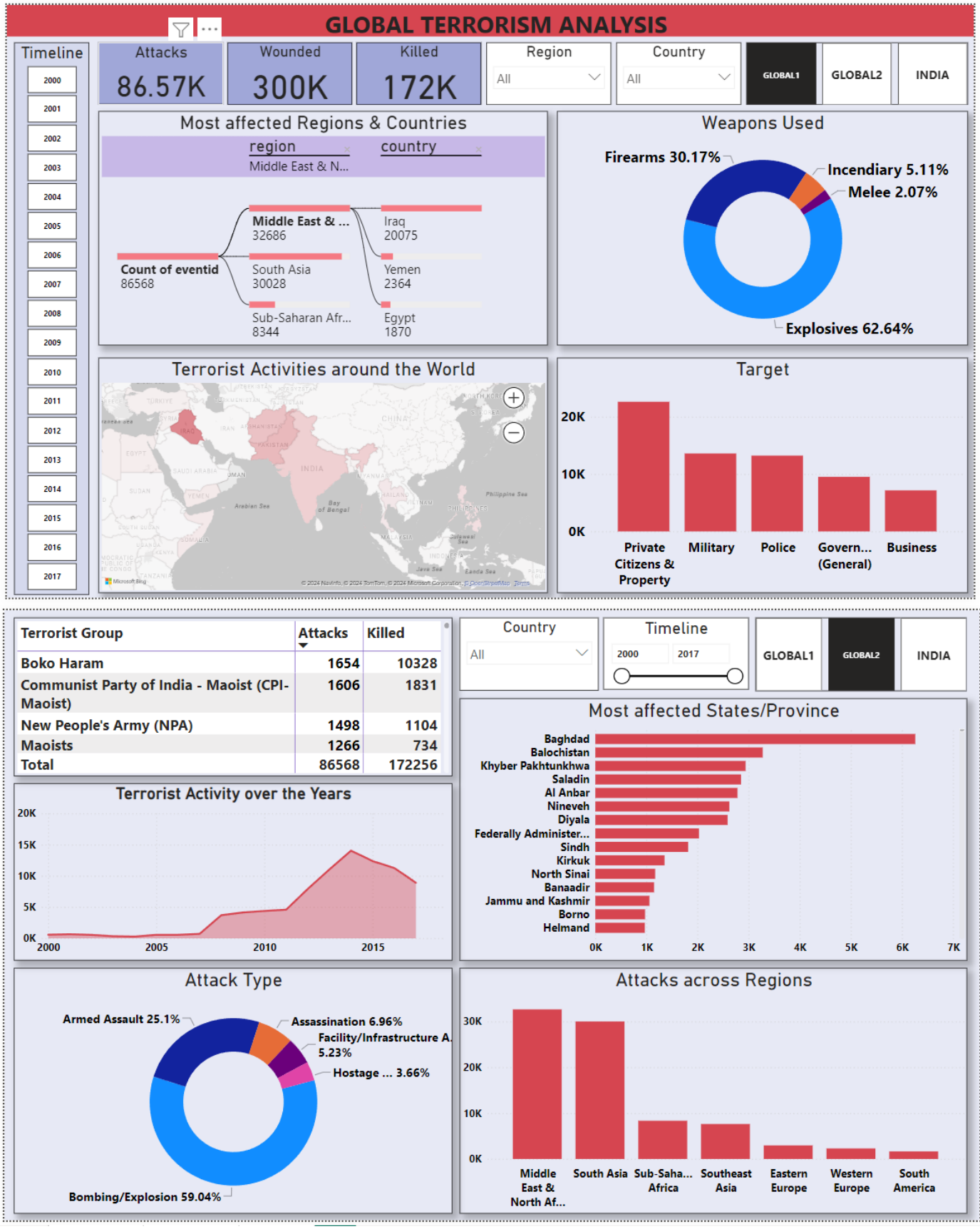
- Explosives are the most commonly used method in over 60% of these incidents followed by firearms.

- Prominent terrorist groups include the Taliban, ISIS, and Al-Shabab.

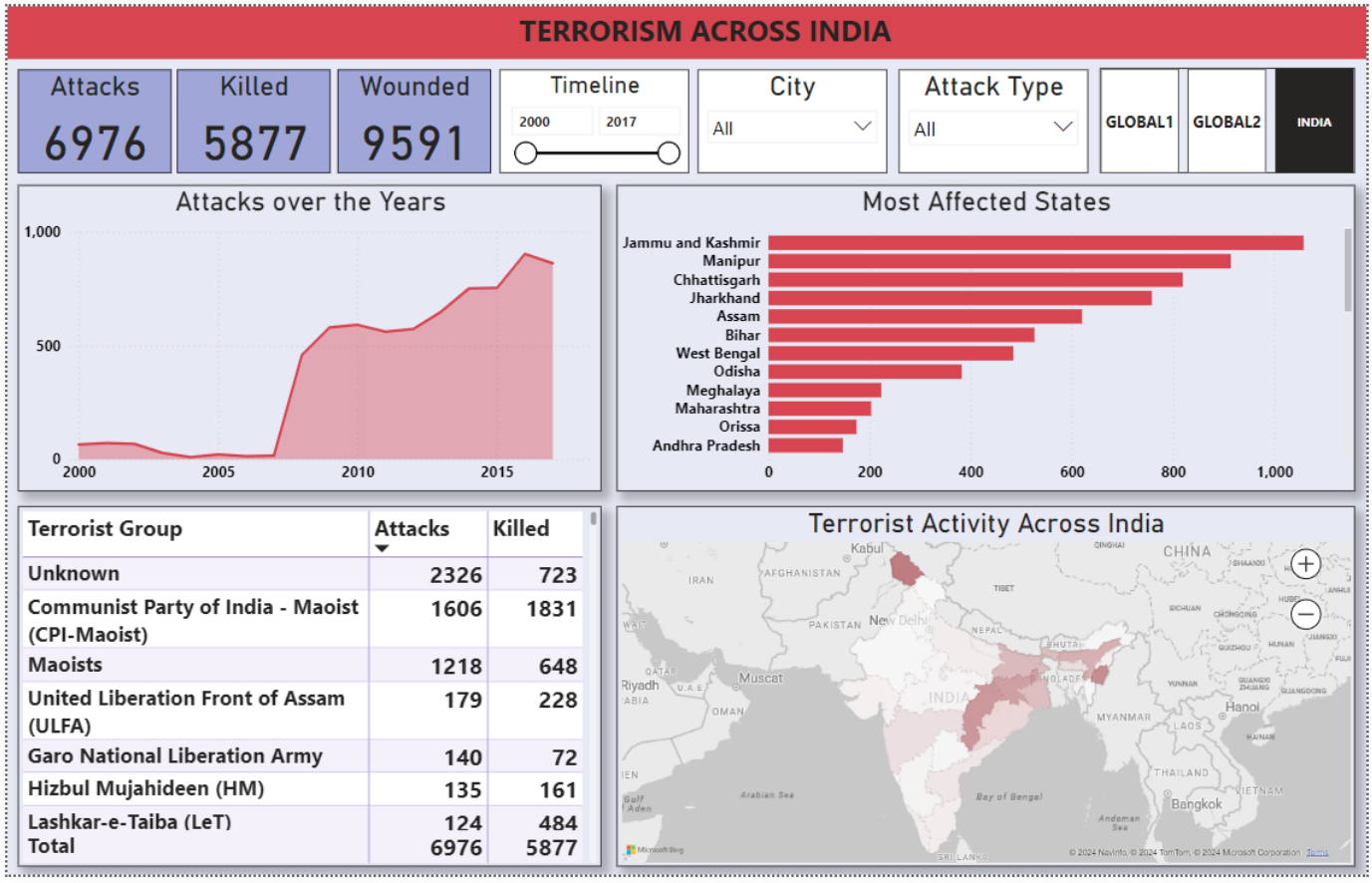
- In India, terrorism is most prevalent in the northern and northeastern regions.

- Jammu and Kashmir experience the highest levels of terrorist activity, although internal factors like Naxalism and Maoist groups also contribute significantly.

TERRORISM ACROSS THE WORLD



TERRORISM ACROSS INDIA



Global Terrorism Data Analysis

```
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. The database is maintained by researchers at the
National Consortium for the Study of Terrorism and
Responses to Terrorism (START), headquartered at the University of Maryland.
```

Data Importing

In [9]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [10]:
```
#import the data

path=r"C:\Users\ayush\Downloads\globalterrorismdb_0718dist(1).csv"
terrorism_data = pd.read_csv(path, low_memory=False, encoding='ISO-8859-1')
```

In [11]:
```
terrorism_data.head()
```

Out[11]:

	eventid	iyear	imonth	iday	approxdate	extended	resolution	country	country_txt	re
0	197000000001	1970	7	2	NaN	0	NaN	58	Dominican Republic	
1	197000000002	1970	0	0	NaN	0	NaN	130	Mexico	
2	197001000001	1970	1	0	NaN	0	NaN	160	Philippines	
3	197001000002	1970	1	0	NaN	0	NaN	78	Greece	
4	197001000003	1970	1	0	NaN	0	NaN	101	Japan	

5 rows × 135 columns

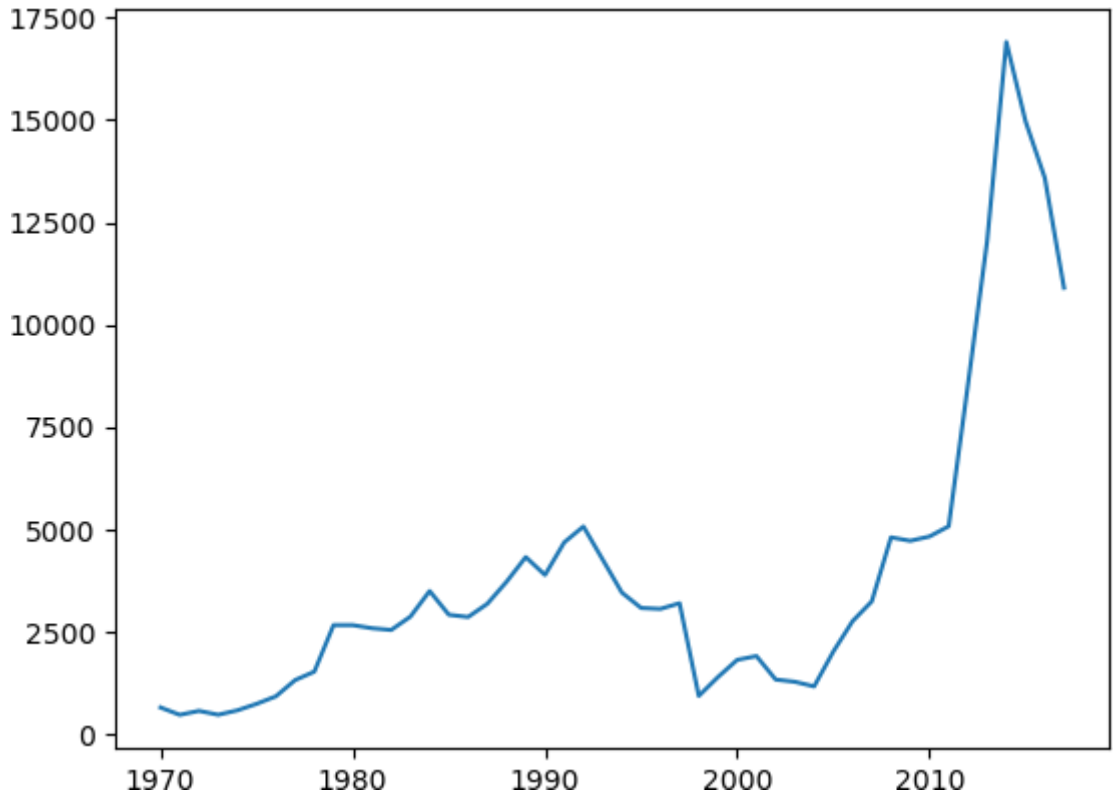
In [12]:
```
terrorism_data.shape
```

Out[12]:
```
(181691, 135)
```

We can see that the dataset contains huge amount of data , we will select suitable columns for our analysis. Also the dataset contains terror info from 1970 - 2017 we will slice the data for a shorter timeframe.

In [13]:
```
# let's see  worldwide terror activity since 1970

terr_activity = terrorism_data.groupby('iyear')['eventid'].count().to_frame()
# yearly trend
plt.plot(terr_activity)
```

Out[13]:
```
[<matplotlib.lines.Line2D at 0x2094e11be90>]
```



We can see steady rise in terrorism since 2000. We will select the 2000-2017 timeframe for our analysis.

In [14]:
```
# selecting the columns
columns_to_keep = ['eventid','iyear','imonth','iday','country_txt',
'region_txt','success','suicide','attacktype1','attacktype1_txt','targtype1_tx
'target1','gname', 'gsubname','nperps','weaptype1_txt','weapsubtype1_txt','nki

df = terrorism_data[terrorism_data['iyear'] >= 2000][columns_to_keep]
```

In [15]:
```
#setting the index

df.set_index('eventid', drop=True, inplace=True)
```

In [16]:
```
#checking the new dataframe

df.head()
```

Out[16]:

eventid	iyear	imonth	iday	country_txt	region_txt	success	suicide	attacktype1	attack
200001010001	2000	1	1	Namibia	Sub-Saharan Africa	1	0	2	Arme
200001010002	2000	1	1	Namibia	Sub-Saharan Africa	1	0	6	Hosta (Ki
200001010003	2000	1	1	India	South Asia	1	0	2	Arm
200001010004	2000	1	1	Kosovo	Eastern Europe	1	0	3	
200001010005	2000	1	1	Somalia	Sub-Saharan Africa	1	0	2	Arm

Data Preparation

In [17]:
```
# data types of columns
df.dtypes
## which seems correct now
```

Out[17]:
```
iyear                int64
imonth               int64
iday                 int64
country_txt         object
region_txt          object
success              int64
suicide              int64
attacktype1          int64
attacktype1_txt     object
targtype1_txt       object
target1             object
gname               object
gsubname            object
nperps             float64
weaptype1_txt       object
weapsubtype1_txt    object
nkill              float64
nwound             float64
city                object
provstate           object
dtype: object
```

In [18]:
```
# checking null values
df.isnull().sum()
```

Out[18]:
```
iyear                  0
imonth                 0
iday                   0
country_txt            0
region_txt             0
success                0
suicide                0
attacktype1            0
attacktype1_txt        0
targtype1_txt          0
target1              170
gname                  0
gsubname           108746
nperps             11353
weaptype1_txt          0
weapsubtype1_txt    8913
nkill               4167
nwound              7980
city                 435
provstate             10
dtype: int64
```

terrorist group sub name is not of much concern to us and it has a lot of missing values we can drop the column. however we need no of terrorists , killed and wounded information for our analysis. so we will drop these rows containing missing data.

In [19]:
```
df.drop(columns=['gsubname','attacktype1'],inplace=True)
```

In [20]:
```
df.dropna(subset=('nperps','weapsubtype1_txt','nkill','nwound'),inplace=True)
```

In [21]:
```
df.dropna(subset=('city'),inplace=True)
```

In [22]:
```
df.dropna(subset=('provstate'),inplace=True)
```

In [23]:
```
df.target1.fillna('Unknown',inplace=True)
```

In [24]:
```
df.isna().sum()
```

Out[24]:
```
iyear               0
imonth              0
iday                0
country_txt         0
region_txt          0
success             0
suicide             0
attacktype1_txt     0
targtype1_txt       0
target1             0
gname               0
nperps              0
weaptype1_txt       0
weapsubtype1_txt    0
nkill               0
nwound              0
city                0
provstate           0
dtype: int64
```

In [25]:
```
# null values are dealt with we will give better name to columns

df.rename(columns = {'iyear':'year','imonth':'month','iday':'day','country_txt
                     'attacktype1_txt':'attacktype','targtype1_txt':'targetype
                     'weapsubtype1_txt':'weaponsubtype','gname':'terroristgrou
```

In [26]:
```
df.head()
```

Out[26]:

eventid	year	month	day	country	region	success	suicide	attacktype	targetype	
200001010027	2000	1	1	United States	North America	1	0	Facility/ Infrastructure Attack	Business	c o
200001020002	2000	1	2	Algeria	Middle East & North Africa	1	0	Armed Assault	Private Citizens & Property	
200001030008	2000	1	3	United States	North America	0	0	Bombing/ Explosion	Abortion Related	P
200001030009	2000	1	3	United States	North America	0	0	Bombing/ Explosion	Abortion Related	
200001030010	2000	1	3	Yemen	Middle East & North Africa	0	1	Bombing/ Explosion	Military	

Now our data is prepared and ready for analysis

Exploratory Data Analysis

In [27]:
```
##distribution of number of terrorists , casualties and wounded
df[['nperpetrators','nkilled','nwounded']].describe()
```

Out[27]:

	nperpetrators	nkilled	nwounded
count	86568.000000	86568.000000	86568.000000
mean	-76.792602	1.989835	3.465634
std	51.020709	7.166689	14.221739
min	-99.000000	0.000000	0.000000
25%	-99.000000	0.000000	0.000000
50%	-99.000000	1.000000	0.000000
75%	-99.000000	2.000000	3.000000
max	3000.000000	670.000000	1500.000000

In [28]:
```
df.nperpetrators.value_counts()
```

Out[28]:
```
nperpetrators
-99.0    69094
 1.0      6578
 2.0      4045
 3.0      1474
 4.0      1184

 99.0        1
 64.0        1
 59.0        1
 28.0        1
 41.0        1
Name: count, Length: 81, dtype: int64
```

In [29]:
```
#this -99 must have been used for unknown terrorist count
#will replace this with 0 since dropping these will lead to large loss of data
df.nperpetrators.replace(-99.0,0,inplace=True)
```

In [30]:
```
df[['nperpetrators','nkilled','nwounded']].describe()
```

Out[30]:

	nperpetrators	nkilled	nwounded
count	86568.000000	86568.000000	86568.000000
mean	2.223963	1.989835	3.465634
std	25.934692	7.166689	14.221739
min	-9.000000	0.000000	0.000000
25%	0.000000	0.000000	0.000000
50%	0.000000	1.000000	0.000000
75%	0.000000	2.000000	3.000000
max	3000.000000	670.000000	1500.000000

In [31]:
```
df.nperpetrators.replace(-9.0,0,inplace=True)
```

In [32]:
```
df[['nperpetrators','nkilled','nwounded']].describe()
```

Out[32]:

	nperpetrators	nkilled	nwounded
count	86568.000000	86568.000000	86568.000000
mean	2.224067	1.989835	3.465634
std	25.934665	7.166689	14.221739
min	0.000000	0.000000	0.000000
25%	0.000000	0.000000	0.000000
50%	0.000000	1.000000	0.000000
75%	0.000000	2.000000	3.000000
max	3000.000000	670.000000	1500.000000

In [33]:
```
df.city.nunique()
```

Out[33]:
```
20840
```

In [34]:
```
df.provstate.nunique()
```

Out[34]:
```
1684
```

In [35]:
```
df.provstate.value_counts()
```

Out[35]:
```
provstate
Baghdad                        6258
Balochistan                    3274
Khyber Pakhtunkhwa             2940
Saladin                        2851
Al Anbar                       2780

Limousin                          1
Ionian Islands                    1
Romblon                           1
Marrakech-Tensift-El Haouz        1
Vidzeme                           1
Name: count, Length: 1684, dtype: int64
```

In [36]:
```
df.targetype.value_counts()
```

Out[36]:
```
targetype
Private Citizens & Property       22641
Military                          13620
Police                            13236
Government (General)               9536
Business                           7164
Unknown                            4911
Religious Figures/Institutions     2469
Transportation                     2437
Educational Institution            2395
Utilities                          1891
Terrorists/Non-State Militia       1847
Journalists & Media                 972
Violent Political Party             947
Government (Diplomatic)             911
Telecommunication                   486
NGO                                 414
Airports & Aircraft                 267
Food or Water Supply                115
Tourists                            102
Other                                90
Maritime                             86
Abortion Related                     31
Name: count, dtype: int64
```

In [37]:
```
df.weapontype.value_counts()
```

Out[37]:
```
weapontype
Explosives      54163
Firearms        26087
Incendiary       4420
Melee            1792
Chemical          105
Radiological        1
Name: count, dtype: int64
```

In [38]:
```
df.attacktype.value_counts()
```

Out[38]:
```
attacktype
Bombing/Explosion                      50647
Armed Assault                          21534
Assassination                           5974
Facility/Infrastructure Attack          4488
Hostage Taking (Kidnapping)             3141
Unarmed Assault                          305
Hostage Taking (Barricade Incident)      276
Hijacking                                196
Unknown                                    7
Name: count, dtype: int64
```

In [39]:
```
#most violent groups
df.terroristgroup.value_counts()
```

Out[39]:
```
terroristgroup
Unknown                                    48154
Taliban                                     5284
Islamic State of Iraq and the Levant (ISIL)     4043
Al-Shabaab                                  2098
Boko Haram                                  1654

United Karbi Liberation Army (UKLA)            1
Terai Rastriya Mukti Sena (TRMS)               1
Minutemen American Defense                     1
Rohingya Solidarity Organization               1
National Freedom Party                         1
Name: count, Length: 1169, dtype: int64
```

In [40]:
```
df.country.nunique()
```

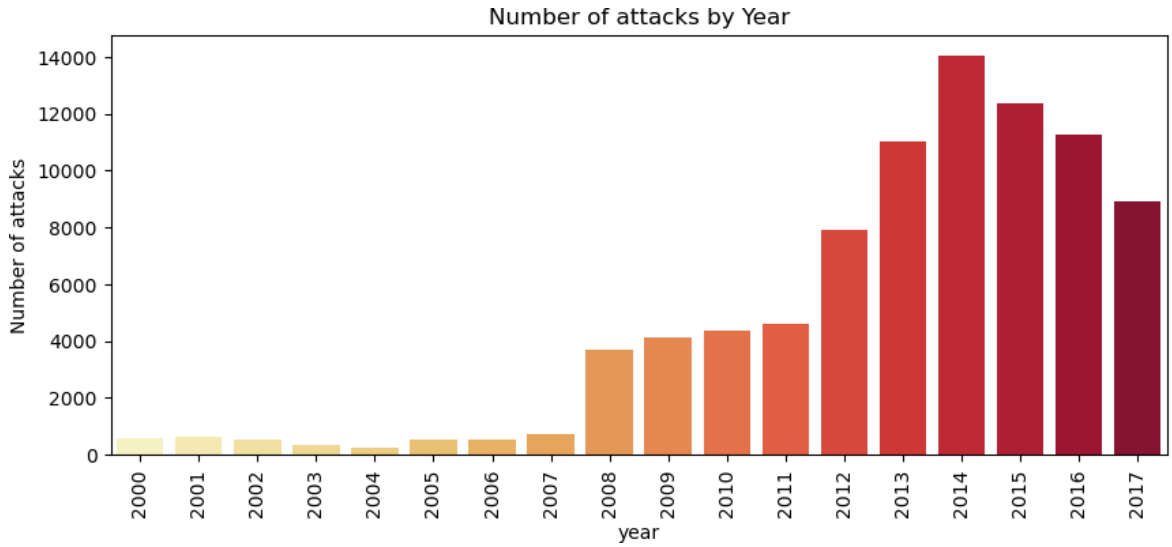
Out[40]:
```
165
```

In [41]:
```
df.region.nunique()
```

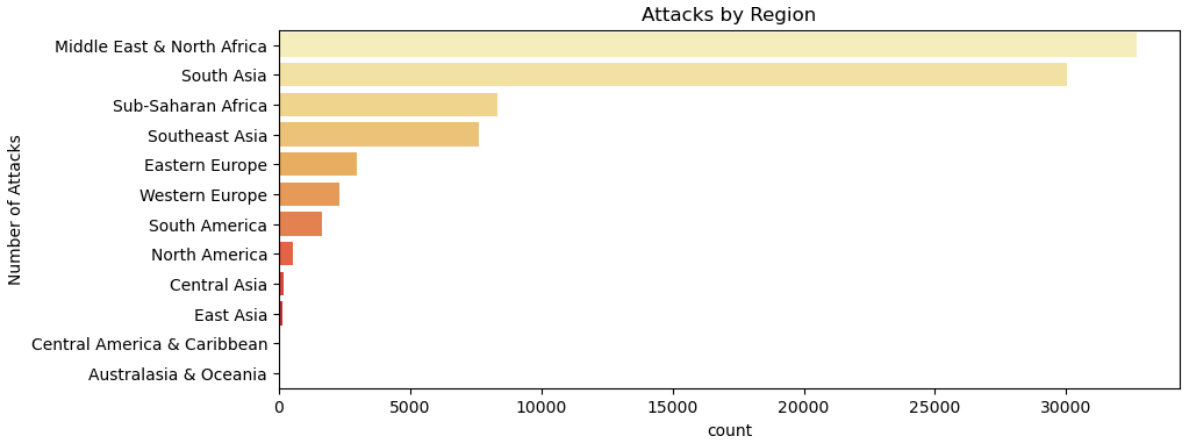
Out[41]:
```
12
```

We have data from 165 countries across 12 regions

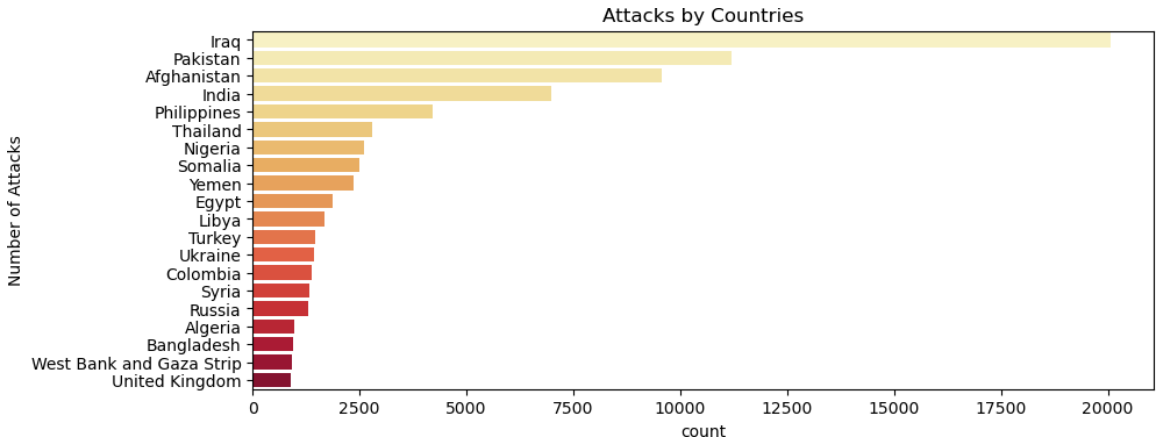
In [52]:
```
# attacks by year

plt.figure(figsize=(10,4))
sns.countplot(x='year',data =df,palette='YlOrRd')

plt.xticks(rotation=90)
plt.ylabel('Number of attacks')
plt.title('Number of attacks by Year')
plt.show()
```



In [51]:
```
# attacks by region

plt.figure(figsize = (10,4))
sns.countplot(y ='region', data = df , palette = 'YlOrRd',
              order = df.region.value_counts().index)
plt.ylabel('Number of Attacks')
plt.title('Attacks by Region')
plt.show()
```



In [55]:
```
#attacks by countries
plt.figure(figsize = (10,4))
sns.countplot(y ='country', data = df , palette = 'YlOrRd',
              order = df.country.value_counts().nlargest(20).to_frame().index)
plt.ylabel('Number of Attacks')
plt.title('Attacks by Countries')
plt.show()
```

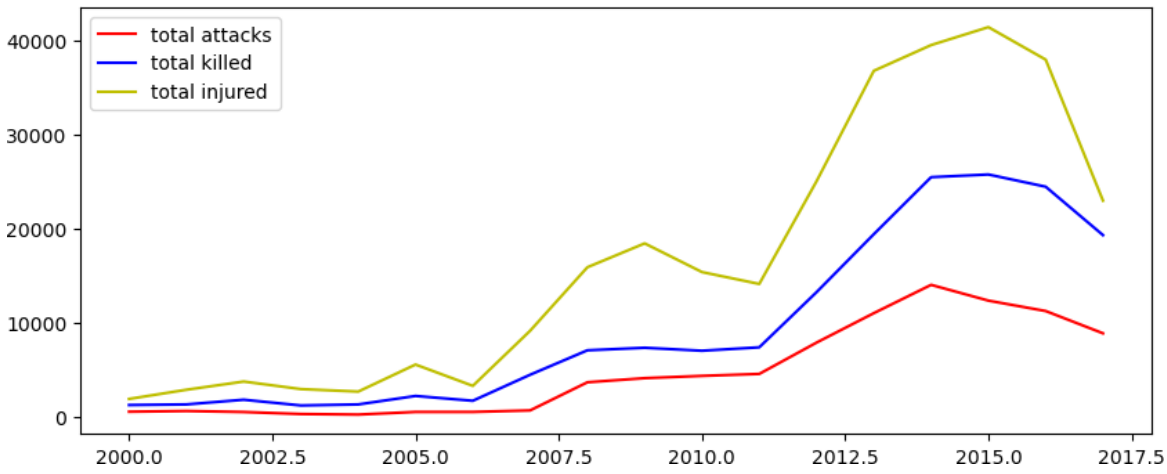


In [44]:
```
# number of incidents and casualties by year

casualties = df.groupby('year').agg({'year':'count','nkilled':'sum','nwounded'

casualties = casualties.rename(columns = {'year':'Total attacks','nkilled':'To

casualties.head()
```

Out[44]:

	year	Total attacks	Total killed	Total injured
0	2000	576	1287.0	1934.0
1	2001	652	1353.0	2909.0
2	2002	546	1850.0	3781.0
3	2003	332	1242.0	2979.0
4	2004	274	1351.0	2714.0

In [49]:
```
#plotting trends of attacks ,deaths and wounded

plt.figure(figsize = (10,4))
plt.plot('year','Total attacks',data = casualties,color='r',label='total attac
plt.plot('year','Total killed',data = casualties,color='b',label='total killed
plt.plot('year','Total injured',data = casualties,color='y',label='total injur
plt.legend()
plt.show()
```



Exporting the Data

In [ ]:
```
filepath=r"D:\DATA SCIENCE\terrorism.csv"
df.to_csv(filepath)
```