Market fires in Nigeria 2020

Overview

The market fires dataset is study on some cases market fires in Nigeria around the year 2020. There are about twenty columns present in this set that describe the name, location, cause and control of each fire outbreak. This analysis looks towards drawing conclusions on and raising possible solutions to market fires in Nigeria.

In [49]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
%matplotlib inline
```

Data Wranging

In [50]:
```
df = pd.read_csv('Market Fires Dataset.csv')
```

In [51]:
```
1 df.head(5)
```

Out[51]:

	Identifier	Date of Fire	Market Name	Src	State	Region	Type of Market	LGA	Actual Start Location	Fire put out by	Reported Start Time
0	NaN	31-Dec-19	Oja Bisi Market	https://www.voiceairmedia.com/2019/12/few-hour...	Ekiti State	South-West	General Goods	Ado Ekiti	Unspecified	Firefighters	NaN
1	NaN	01-Jan-20	Timber section Industrial Market Umuahia	https://punchng.com/fire-destroys-umuahia-indu...	Abia State	South-East	Timber Market	Umuahia	Timber Section	Firefighters	NaN
2	NaN	03-Jan-20	Amassoma NDU Shopping complex	https://www.vanguardngr.com/2020/01/fire-destr...	Bayelsa State	South-South	Roadside Shops	Southern Ijaw LGA	Shopping complex	Traders	4:00 PM
3	NaN	03-Jan-20	Ogbete Market	https://www.vanguardngr.com/2020/01/breaking-f...	Enugu State	South-East	General Goods	Enugu North LG	Foam Shop	Firefighters	2:00 PM
4	NaN	05-Jan-20	Akesan Market	https://guardian.ng/news/traders-count-losses-...	Oyo State	South-West	General Goods	Oyo East LGA	Unspecified	Firefighters	12:30 AM

In [52]:
```
1 df.shape
```

Out[52]: (20, 20)

Data Cleaning

Dropping useless column(s)

In [53]:
```
useless_column = ['Identifier','Reported Start Time','Reported Time Put Out']
df.drop(useless_column,1,inplace=True)
```

Changing index from 0 to 1

In [54]:
```
df.index = np.arange(1, len(df)+1)
```

Checking for duplicated values

In [55]:
```
df.duplicated().sum()
```

Out[55]:
```
0
```

Changing the format of Date of Fire

In [56]:
```
df['Date of Fire'] = pd.to_datetime(df['Date of Fire'])
```

In [57]:
```
1 df.head(3)
```

Out[57]:

	Date of Fire	Market Name	Src	State	Region	Type of Market	LGA	Actual Start Location	Fire put out by	Fatalities	Looting	F
1	2019-12-31	Oja Bisi Market	https://www.voiceairmedia.com/2019/12/few-hour...	Ekiti State	South-West	General Goods	Ado Ekiti	Unspecified	Firefighters	Unknown	Unknown	G
2	2020-01-01	Timber section Industrial Market Umuahia	https://punchng.com/fire-destroys-umuahia-indu...	Abia State	South-East	Timber Market	Umuahia	Timber Section	Firefighters	No	Unknown	
3	2020-01-03	Amassoma NDU Shopping complex	https://www.vanguardngr.com/2020/01/fire-destr...	Bayelsa State	South-South	Roadside Shops	Southern Ijaw LGA	Shopping complex	Traders	No	Unknown	

Exploratory Data Analysis (EDA)

In [58]:
```
1 #### How many fire outbreaks were studied?
```

In [59]:
```
1 df.shape #20
```

Out[59]: (20, 17)

In [60]:
```
1 #### In how many different markets had outbreaks?
```

In [61]:
```
df['Market Name'].nunique() #20
```

Out[61]: 20

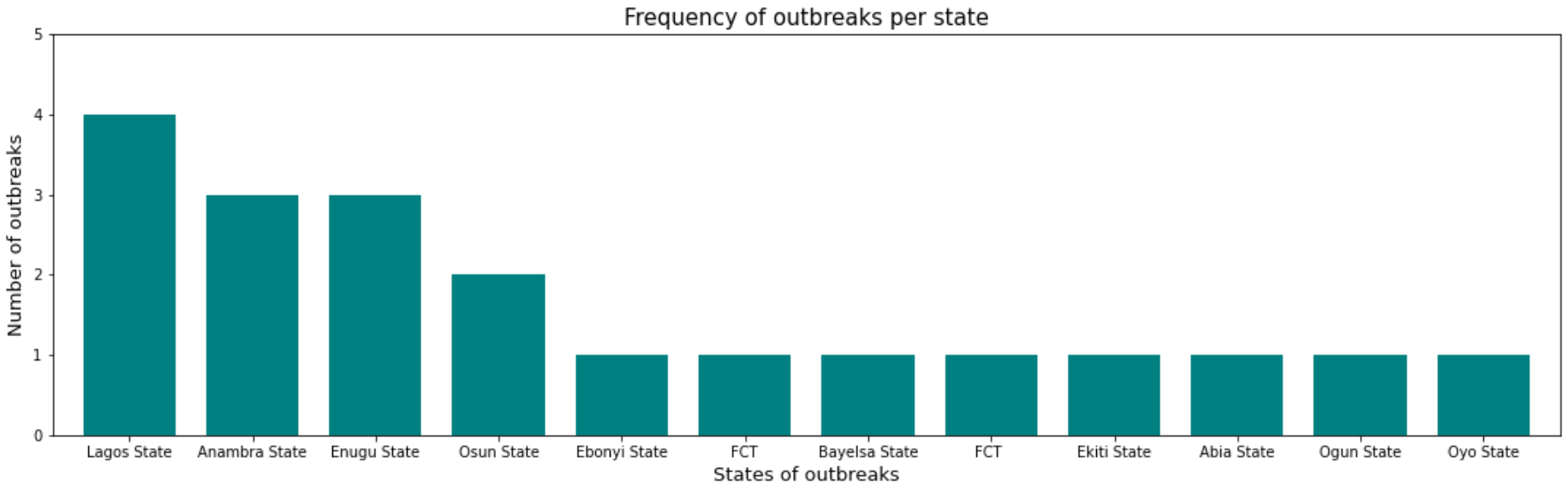
In [62]:
```
#### In how many states were fire outbreaks recorded?
```

In [63]:
```
df['State'].nunique()
```

Out[63]: 12

In [64]:
```
#### Which state(s) had the most outbreaks?
```

In [101]:
```
fig = plt.figure()
axes = fig.add_axes([0.0, 0.1, 2.39, 0.95])
axes.set_xlabel('States of outbreaks', fontsize=13)
axes.set_ylabel('Number of outbreaks', fontsize=13)
axes.set_title('Frequency of outbreaks per state', fontsize=15)
states_with_outbreaks = df['State'].value_counts()
states_with_outbreaks.plot(kind='bar', x='State' , color='teal', ylim=(0,5), width=0.75)
fig.autofmt_xdate(rotation=0,ha='center')
```



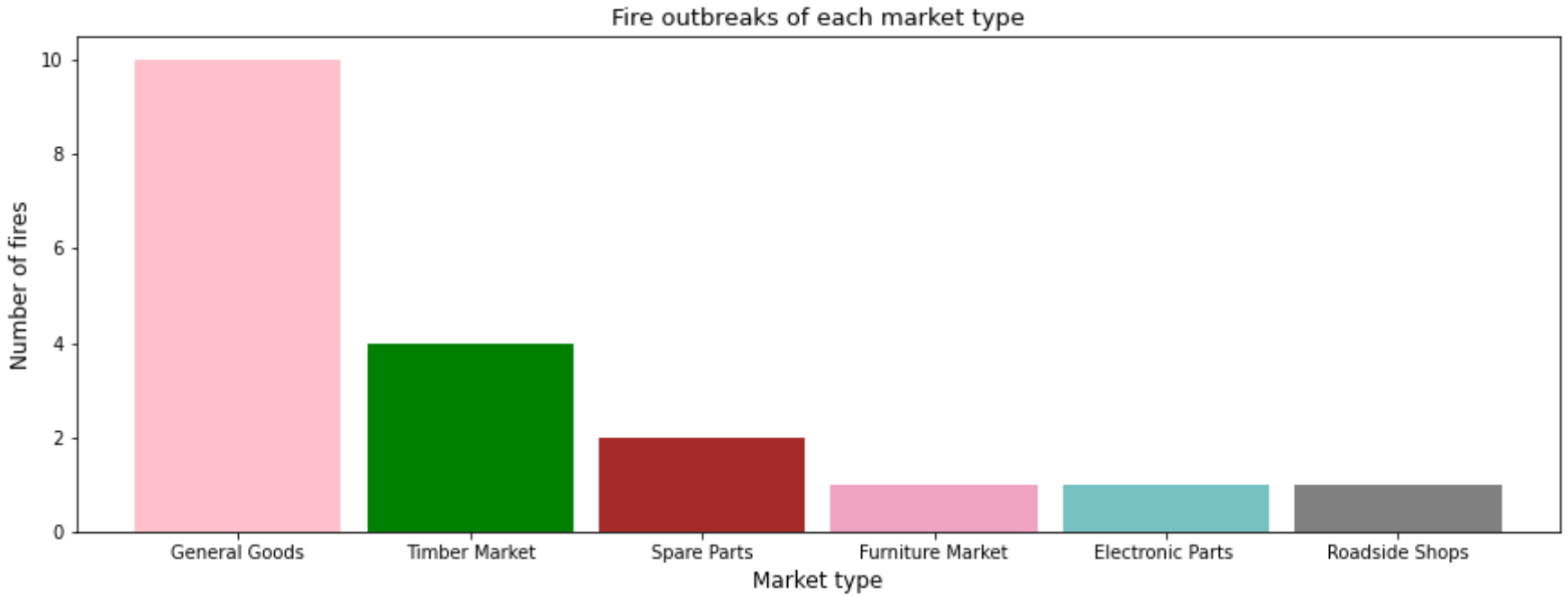
In [66]:
```
#### In which type of market did fires break out most?
```

In [118]:
```
fig = plt.figure()
axes = fig.add_axes([0.6,0.1,1.9,0.95])
axes.set_title('Fire outbreaks of each market type', fontsize=13)

axes.set_xlabel('Market type', fontsize=12)
axes.set_ylabel('Number of fires', fontsize=12)

market_type = df['Type of Market']
market_type.value_counts().plot(kind='bar',
                                color=['pink','green','brown',(0.9, 0.4, 0.6, 0.6),(0.1, 0.6, 0.6, 0.6),'grey

fig.autofmt_xdate(rotation=0,ha='center')
```

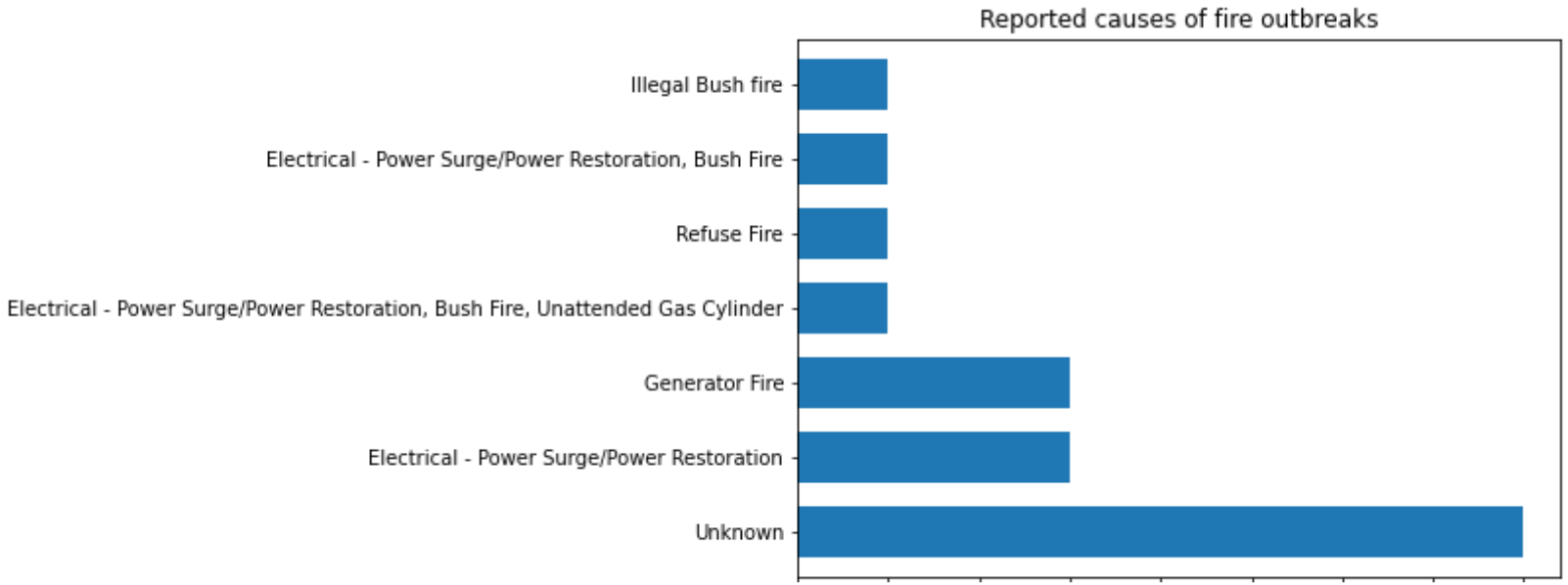


In [68]:
```
#### What was the most reported cause of fire?
```

In [108]:
```
fig =plt.figure()
axes = fig.add_axes([4.9,.1, 0.9,0.95])
axes.set_xlabel('Number of fires caused')
axes.set_title('Reported causes of fire outbreaks')
reported_causes = df['Reported Causes'].value_counts()
reported_causes.plot(kind='barh', x='Reported Causes', width=0.7)

```

Out[108]: <matplotlib.axes._axes.Axes at 0x2485e2a33a0>



In [70]:
```
#### How many markets experienced recurring outbreaks?
```

In [71]:
```
recurring_outbreaks_count = df['Recurring?'].eq('Yes')
recurring_outbreaks_count.sum()
```

Out[71]: 4

In [72]:
```
recurring_outbreaks_df = df[recurring_outbreaks_count]
recurring_outbreaks_df['Market Name'].unique()
```

Out[72]:
```
array(['Timber section Industrial Market Umuahia',
       'Kugbo Furniture Market', 'Balogun Market ', 'Mile 12 Market'],
      dtype=object)
```

In [73]:
```
#### Which state had the most recurring outbreaks?
```

In [74]:
```
recurring_outbreaks_df['State'].value_counts()
```

Out[74]:
```
Lagos State    2
Abia State     1
FCT            1
Name: State, dtype: int64
```

In [75]:
```
#### How many newspaper companies carried the news of recent fire outbreaks?
```

In [76]:
```
df['Src'].nunique()
```

Out[76]:
```
19
```

In [77]:
```
all_sources = np.concatenate((df['Src'], df['Recurring src']))
all_sources = pd.Series(all_sources)
all_sources.nunique()
```

Out[77]:
```
22
```

In [78]:
```
#### Which newspaper(s) can be said to be more reliable for news on fire outbreaks?
```

In [79]:
```
all_sources.value_counts()
all_sources.mode()
```

Out[79]:
```
0    https://www.pulse.ng/news/local/in-lagos-2-dea... (https://www.pulse.ng/news/local/in-lagos-2-dea...)
dtype: object
```

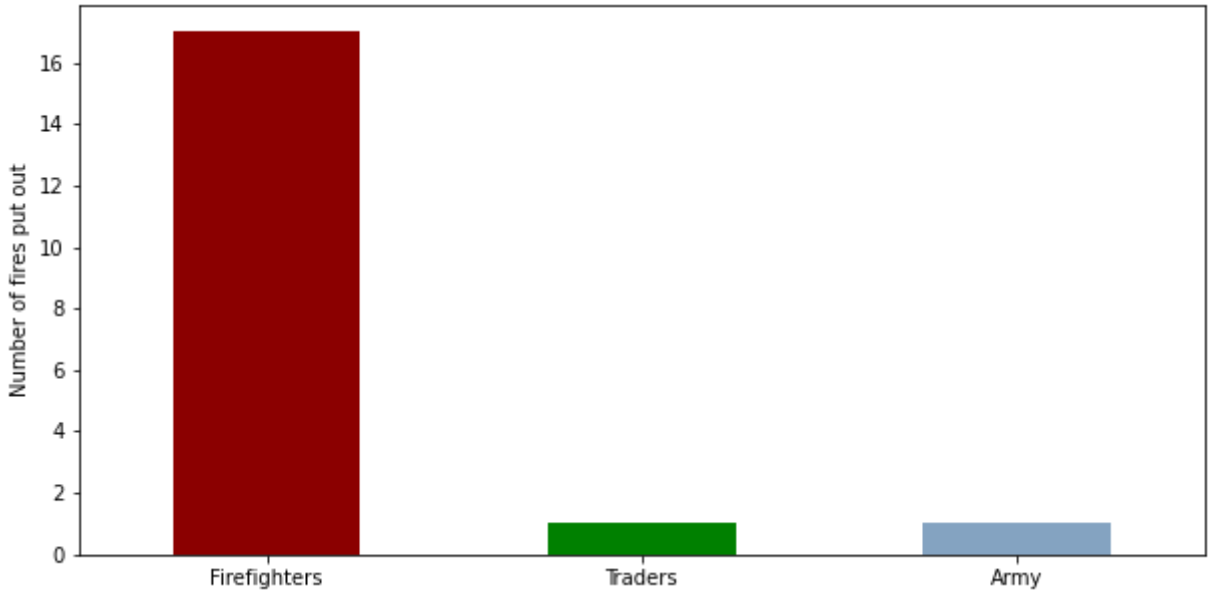
In [80]:
```
#### Just how important are fire fighters in controlling and quenching market fires?
```

In [109]:

```
fig = plt.figure()
axes = fig.add_axes([0.6,0.1,1.3,0.95])
axes.set_ylabel('Number of fires put out')

fire_stoppers = df['Fire put out by']
fire_stoppers.value_counts().plot(kind='bar', color=['darkred','green',(0.2, 0.4, 0.6, 0.6)])

fig.autofmt_xdate(rotation=0,ha='center')
```



In [82]:

```
#### Which market fire had fatalities?
```

In [83]:
```
fatalities = df[df['Fatalities'].eq('Yes')]
fatalities.head()
```

Out[83]:

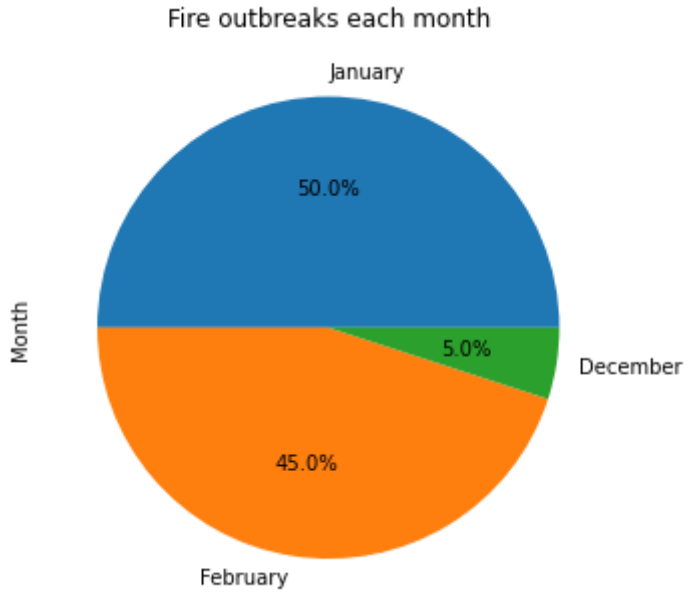
	Date of Fire	Market Name	Src	State	Region	Type of Market	LGA	Actual Start Location	Fire put out by	Fatalities	Looting	Reported Causes	Recurring?	WI
5	2020-01-05	Akesan Market	https://guardian.ng/news/traders-count-losses-...	Oyo State	South-West	General Goods	Oyo East LGA	Unspecified	Firefighters	Yes	Yes	Unknown	No	

In [84]:
```
#### Which month had the most fire outbreaks?
```

In [117]:
```
fig = plt.figure()
axes = fig.add_axes([0.6,0.1,1,1.])
axes.set_title('Fire outbreaks each month')

df['Month'] = df['Date of Fire'].dt.month_name()
df['Month'].value_counts().plot(kind='pie',autopct='%1.1f%%')
```

Out[117]:
```
<matplotlib.axes._axes.Axes at 0x2485ebb7490>
```



In [86]:
```
#### Do the citizens need more enlightenment on the use of extinguishers?
```

In [87]:
```
(df['Effective Use of Fire Extinguishers'].eq('Yes')).value_counts()
```

Out[87]:
```
False    19
True      1
Name: Effective Use of Fire Extinguishers, dtype: int64
```

Conclusions

- Lagos had the most fire outbreaks.

- Four markets have had recurring outbreaks.
- Two recurring fire outbreaks have been recorded in Lagos.
- Not many fatalities were recorded.
- Punch.ng is most reliable for news on fire outbreaks.
- Firefighters were crucial in controlling and stopping fires.
- Most of the market fires in 2020 occurred in January.

Possible solutions

- Citizens need to be enlightened on the use of fire extinguishers and other control methods.
- To reduce fatality, firefighters should be contacted as early as possible.