Gun_violence_data

In [1]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import plotly.express as px
import plotly.figure_factory as ff
%matplotlib inline
```

Importing the dataset

In [2]:
```
gun_data = pd.read_csv('Gun_violence_data.csv',dtype=str)
```

In [3]:
```
gun_data
```

Out[3]:

	incident_id	date	day	state	city_or_county	address	n_killed	n_inju
0	461105	01-Jan-13	Tuesday	Pennsylvania	Mckeesport	1506 Versailles Avenue and Coursin Street	0	
1	460726	01-Jan-13	Tuesday	California	Hawthorne	13500 block of Cerise Avenue	1	
2	478855	01-Jan-13	Tuesday	Ohio	Lorain	1776 East 28th Street	1	
3	478925	05-Jan-13	Saturday	Colorado	Aurora	16000 block of East Ithaca Place	4	
4	478959	07-Jan-13	Monday	North Carolina	Greensboro	307 Mourning Dove Terrace	2	
...	...	...	...	...	...	...	...	
241392	1293054	11-Sep-20	Friday	California	Torrance	22501 Hawthorne Blvd	3	
241393	1292941	12-Sep-20	Saturday	Arizona	Yuma	3800 block of E County 18 閹 St	1	
241394	1291779	13-Sep-20	Sunday	Arkansas	Jonesboro	3516 Galaxy St	1	
241395	1289877	14-Sep-20	Monday	South Carolina	Columbia	1709 Decker Blvd	0	
241396	1289618	15-Sep-20	Tuesday	Florida	Tallahassee	2020 W Pensacola St	0	

241397 rows × 31 columns

Displaying the shape of dataset

In [4]:
```
gun_data.shape
```

Out[4]: (241397, 31)

Displaying info of dataset

In [5]:
```
gun_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 241397 entries, 0 to 241396
Data columns (total 31 columns):
 #   Column                          Non-Null Count   Dtype 
---  ------                          --------------   ----- 
 0   incident_id                     241397 non-null  object
 1   date                            241397 non-null  object
 2   day                             241397 non-null  object
 3   state                           241397 non-null  object
 4   city_or_county                  241397 non-null  object
 5   address                         224899 non-null  object
 6   n_killed                        241397 non-null  object
 7   n_injured                       241395 non-null  object
 8   incident_url                    239677 non-null  object
 9   source_url                      239209 non-null  object
 10  incident_url_fields_missing     239677 non-null  object
 11  congressional_district          227733 non-null  object
 12  gun_stolen                      140179 non-null  object
 13  gun_type                        140226 non-null  object
 14  incident_characteristics        239351 non-null  object
 15  latitude                        231754 non-null  object
 16  location_description            42089 non-null   object
 17  longitude                       231754 non-null  object
 18  n_guns_involved                 140226 non-null  object
 19  notes                           158660 non-null  object
 20  participant_age                 147379 non-null  object
 21  participant_age_group           197558 non-null  object
 22  participant_gender              203315 non-null  object
 23  participant_name                117424 non-null  object
 24  participant_relationship        15774 non-null   object
 25  participant_status              212051 non-null  object
 26  participant_type                214814 non-null  object
 27  sources                         239068 non-null  object
 28  state_house_district            200905 non-null  object
 29  state_senate_district           207342 non-null  object
 30  critical                        241397 non-null  object
dtypes: object(31)
memory usage: 57.1+ MB
```

Displaying missing values from the dataset

In [6]:
```
gun_data.isnull().sum()
```

Out[6]:
```
incident_id                         0
date                                0
day                                 0
state                               0
city_or_county                      0
address                         16498
n_killed                            0
n_injured                           2
incident_url                     1720
source_url                       2188
incident_url_fields_missing      1720
congressional_district          13664
gun_stolen                     101218
gun_type                       101171
incident_characteristics         2046
latitude                         9643
location_description           199308
longitude                        9643
n_guns_involved                101171
notes                           82737
participant_age                 94018
participant_age_group           43839
participant_gender              38082
participant_name               123973
participant_relationship       225623
participant_status              29346
participant_type                26583
sources                          2329
state_house_district            40492
state_senate_district           34055
critical                            0
dtype: int64
```

Display the number and name of columns

In [7]:
```
print('Columns :', list(gun_data))
print('Number of columns :', len(list(gun_data)))
```

```
Columns : ['incident_id', 'date', 'day', 'state', 'city_or_county', 'address
', 'n_killed', 'n_injured', 'incident_url', 'source_url', 'incident_url_fiel
ds_missing', 'congressional_district', 'gun_stolen', 'gun_type', 'incident_c
haracteristics', 'latitude', 'location_description', 'longitude', 'n_guns_in
volved', 'notes', 'participant_age', 'participant_age_group', 'participant_g
ender', 'participant_name', 'participant_relationship', 'participant_status'
, 'participant_type', 'sources', 'state_house_district', 'state_senate_distr
ict', 'critical']
Number of columns : 31
```

Drop the less featured columns

In [8]:
```
gun_data = gun_data.drop(['incident_url','source_url','incident_url_fields_m
                          'gun_type','incident_characteristics','latitude','
                          'n_guns_involved','notes','participant_age','parti
                          'participant_name','participant_relationship','par
                          'sources','state_house_district','state_senate_dis
```

In [9]:
```
gun_data.head()
```

Out[9]:

	incident_id	date	day	state	city_or_county	address	n_killed	n_injured	cı
0	461105	01-Jan-13	Tuesday	Pennsylvania	Mckeesport	1506 Versailles Avenue and Coursin Street	0	4	F
1	460726	01-Jan-13	Tuesday	California	Hawthorne	13500 block of Cerise Avenue	1	3	F
2	478855	01-Jan-13	Tuesday	Ohio	Lorain	1776 East 28th Street	1	3	F
3	478925	05-Jan-13	Saturday	Colorado	Aurora	16000 block of East Ithaca Place	4	0	
4	478959	07-Jan-13	Monday	North Carolina	Greensboro	307 Mourning Dove Terrace	2	2	F

In [10]:
```
gun_data.shape
```

Out[10]:
```
(241397, 9)
```

Renaming the columns

In [11]:
```
gun_data.rename(columns={"n_killed": "killed","n_injured":"injured"}, inplac
gun_data.head()
```

Out[11]:

	incident_id	date	day	state	city_or_county	address	killed	injured	critica
0	461105	01-Jan-13	Tuesday	Pennsylvania	Mckeesport	1506 Versailles Avenue and Coursin Street	0	4	FALSE
1	460726	01-Jan-13	Tuesday	California	Hawthorne	13500 block of Cerise Avenue	1	3	FALSE
2	478855	01-Jan-13	Tuesday	Ohio	Lorain	1776 East 28th Street	1	3	FALSE
3	478925	05-Jan-13	Saturday	Colorado	Aurora	16000 block of East Ithaca Place	4	0	TRUE
4	478959	07-Jan-13	Monday	North Carolina	Greensboro	307 Mourning Dove Terrace	2	2	FALSE

In [12]:
```
gun_data.isnull().sum()
```

Out[12]:
```
incident_id            0
date                   0
day                    0
state                  0
city_or_county         0
address            16498
killed                 0
injured                2
critical               0
dtype: int64
```

In [13]:
```
gun_data.dtypes
```

Out[13]:
```
incident_id       object
date              object
day               object
state             object
city_or_county    object
address           object
killed            object
injured           object
critical          object
dtype: object
```

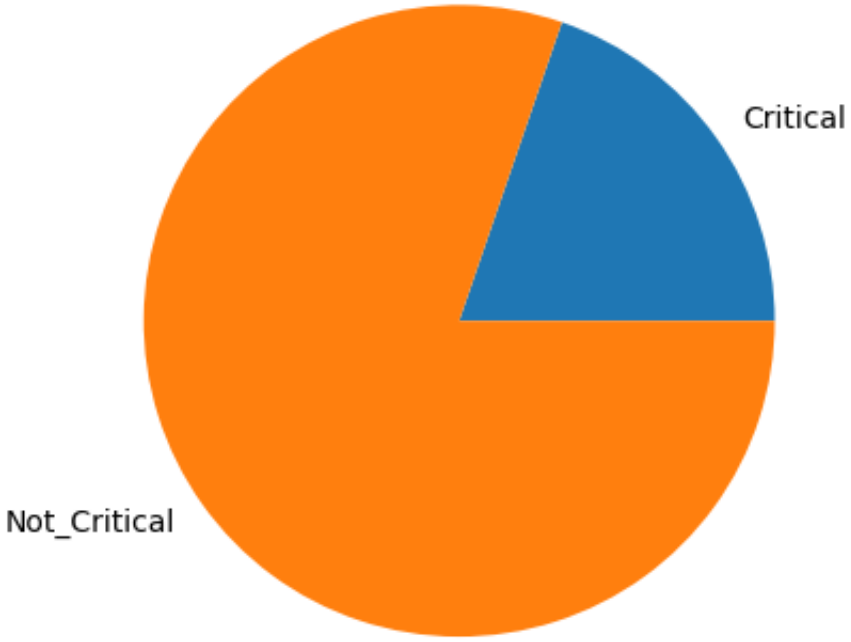
Displaying the critical and non-crititcal cases

In [21]:
```
non_critical = len(gun_data[gun_data['critical'] == 'FALSE'])
critical = len(gun_data[gun_data['critical'] == 'TRUE'])
```

In [15]:
```
print('Number of Critical cases : ', critical)
print('Number of Non-critical cases : ', non_critical)

plt.pie([critical,non_critical], labels=['Critical', 'Not_Critical'], radius
plt.show()
```

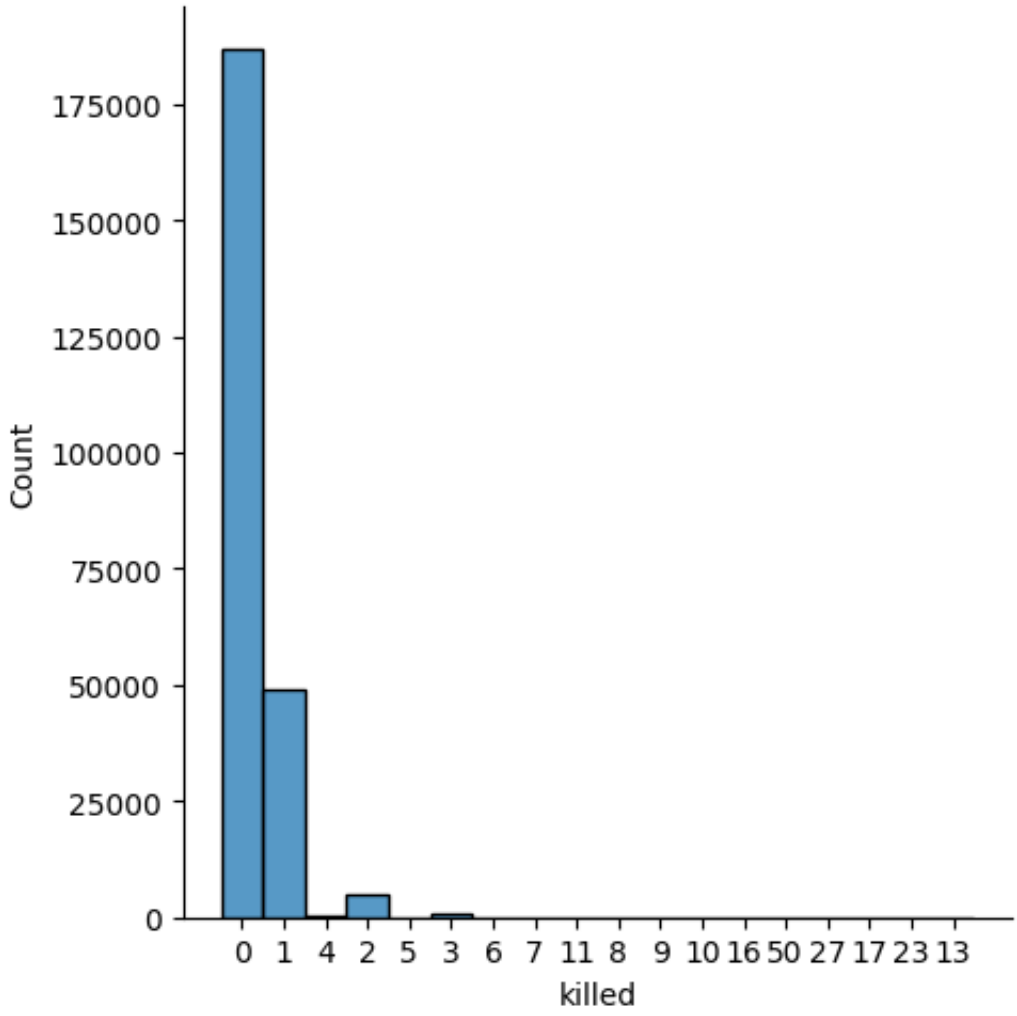
```
Number of Critical cases :  47607
Number of Non-critical cases :  193790
```



Displaying the killed count

In [16]:
```
sns.displot(gun_data,x="killed",binwidth=10)
```

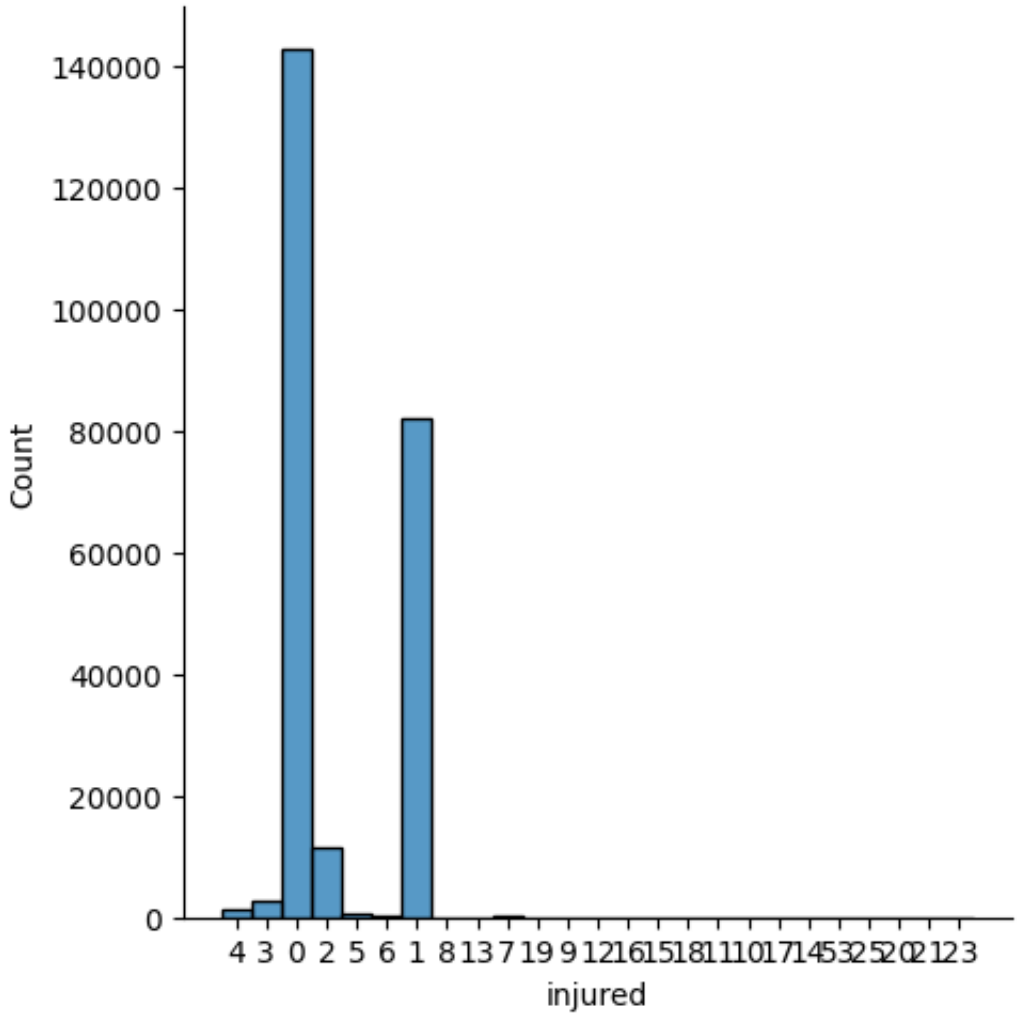
Out[16]:
```
<seaborn.axisgrid.FacetGrid at 0x7fc2bcd25a60>
```



Displaying the injured count

In [17]:
```
sns.displot(gun_data,x="injured",binwidth=10)
```

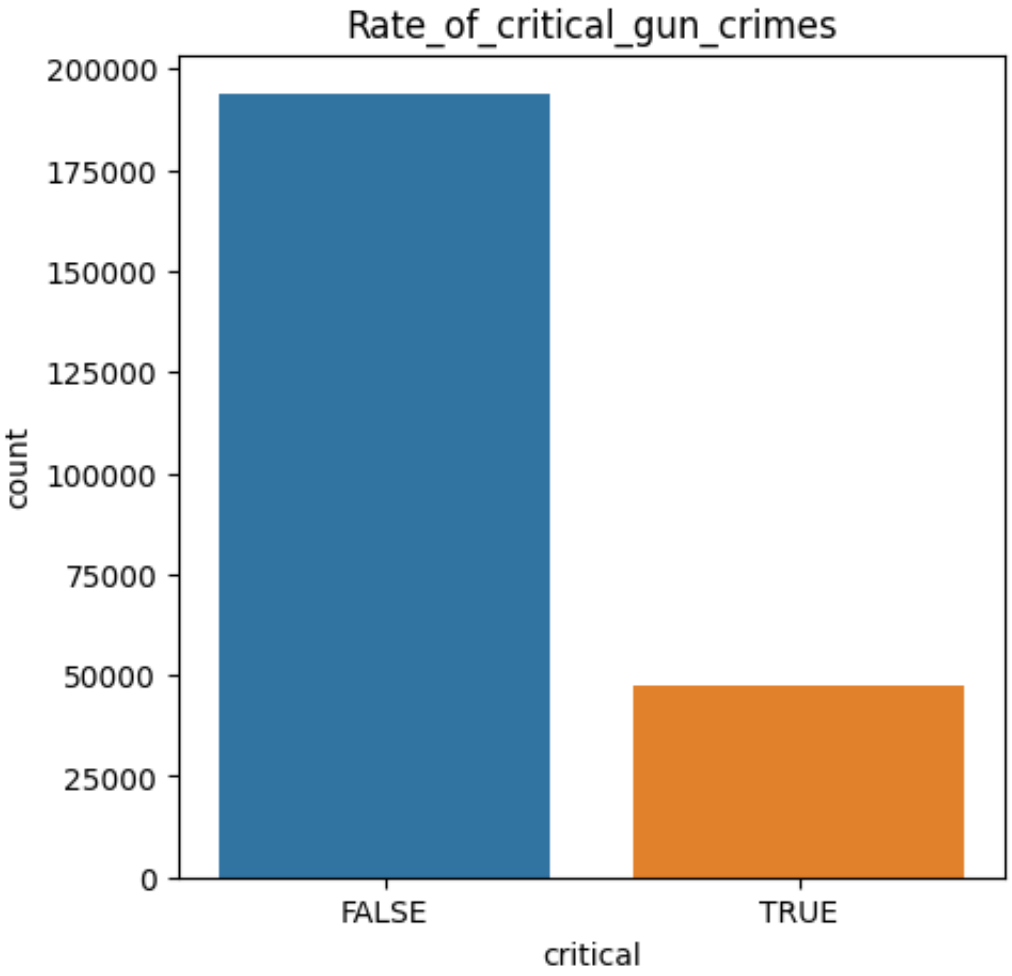
Out[17]:
```
<seaborn.axisgrid.FacetGrid at 0x7fc2bcd15b80>
```



Checking the rate of critical gun crimes

In [18]:
```
sns.countplot(x = gun_data['critical'])
fig = plt.gcf()
fig.set_size_inches(5,5)
plt.title('Rate_of_critical_gun_crimes')
```

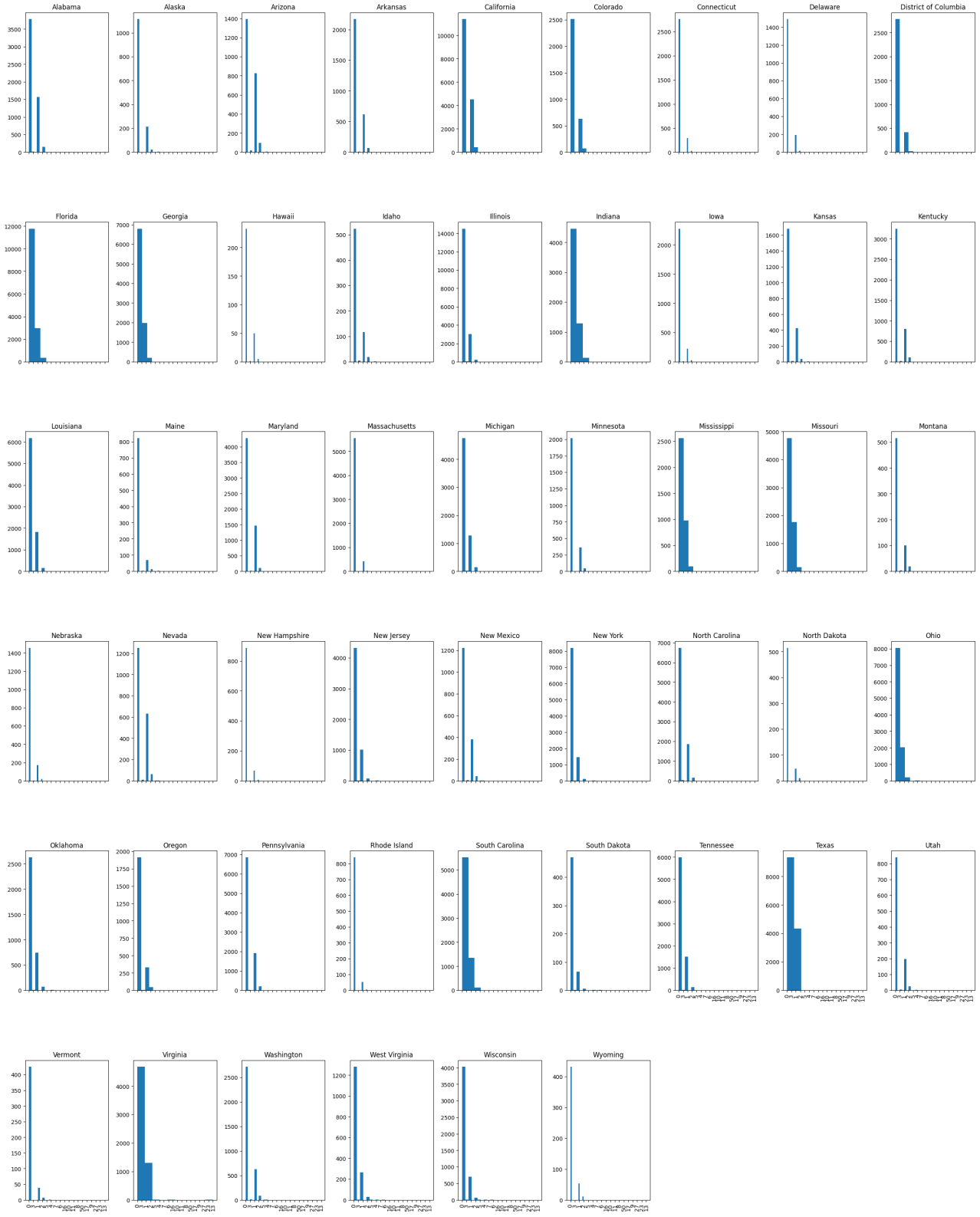
Out[18]:
```
Text(0.5, 1.0, 'Rate_of_critical_gun_crimes')
```



Displaying the killed count by the states

In [19]:
```
gun_data.hist(column='killed',by='state',layout=(6,9),figsize=(30,40),sharex
```

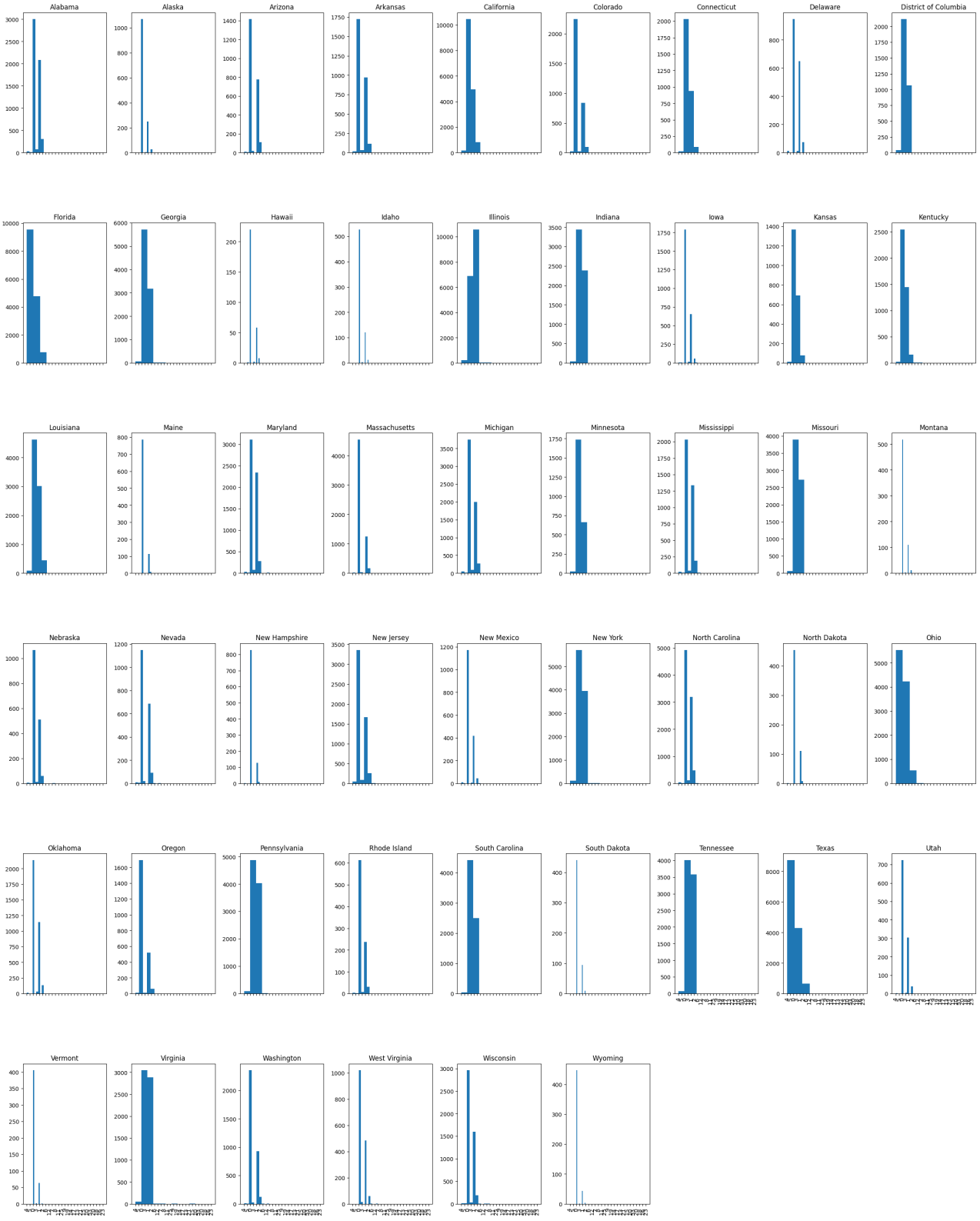
Out[19]:
```
array([[<Axes: title={'center': 'Alabama'}>,
        <Axes: title={'center': 'Alaska'}>,
        <Axes: title={'center': 'Arizona'}>,
        <Axes: title={'center': 'Arkansas'}>,
        <Axes: title={'center': 'California'}>,
        <Axes: title={'center': 'Colorado'}>,
        <Axes: title={'center': 'Connecticut'}>,
        <Axes: title={'center': 'Delaware'}>,
        <Axes: title={'center': 'District of Columbia'}>],
       [<Axes: title={'center': 'Florida'}>,
        <Axes: title={'center': 'Georgia'}>,
        <Axes: title={'center': 'Hawaii'}>,
        <Axes: title={'center': 'Idaho'}>,
        <Axes: title={'center': 'Illinois'}>,
        <Axes: title={'center': 'Indiana'}>,
        <Axes: title={'center': 'Iowa'}>,
        <Axes: title={'center': 'Kansas'}>,
        <Axes: title={'center': 'Kentucky'}>],
       [<Axes: title={'center': 'Louisiana'}>,
        <Axes: title={'center': 'Maine'}>,
        <Axes: title={'center': 'Maryland'}>,
        <Axes: title={'center': 'Massachusetts'}>,
        <Axes: title={'center': 'Michigan'}>,
        <Axes: title={'center': 'Minnesota'}>,
        <Axes: title={'center': 'Mississippi'}>,
        <Axes: title={'center': 'Missouri'}>,
        <Axes: title={'center': 'Montana'}>],
       [<Axes: title={'center': 'Nebraska'}>,
        <Axes: title={'center': 'Nevada'}>,
        <Axes: title={'center': 'New Hampshire'}>,
        <Axes: title={'center': 'New Jersey'}>,
        <Axes: title={'center': 'New Mexico'}>,
        <Axes: title={'center': 'New York'}>,
        <Axes: title={'center': 'North Carolina'}>,
        <Axes: title={'center': 'North Dakota'}>,
        <Axes: title={'center': 'Ohio'}>],
       [<Axes: title={'center': 'Oklahoma'}>,
        <Axes: title={'center': 'Oregon'}>,
        <Axes: title={'center': 'Pennsylvania'}>,
        <Axes: title={'center': 'Rhode Island'}>,
        <Axes: title={'center': 'South Carolina'}>,
        <Axes: title={'center': 'South Dakota'}>,
        <Axes: title={'center': 'Tennessee'}>,
        <Axes: title={'center': 'Texas'}>,
        <Axes: title={'center': 'Utah'}>],
       [<Axes: title={'center': 'Vermont'}>,
        <Axes: title={'center': 'Virginia'}>,
        <Axes: title={'center': 'Washington'}>,
        <Axes: title={'center': 'West Virginia'}>,
        <Axes: title={'center': 'Wisconsin'}>,
        <Axes: title={'center': 'Wyoming'}>, <Axes: >, <Axes: >,
        <Axes: >]], dtype=object)
```



Displaying the injured count by the states

In [20]:
```
gun_data.hist(column='injured',by='state',layout=(6,9),figsize=(30,40),share
```

Out[20]:
```
array([[<Axes: title={'center': 'Alabama'}>,
        <Axes: title={'center': 'Alaska'}>,
        <Axes: title={'center': 'Arizona'}>,
        <Axes: title={'center': 'Arkansas'}>,
        <Axes: title={'center': 'California'}>,
        <Axes: title={'center': 'Colorado'}>,
        <Axes: title={'center': 'Connecticut'}>,
        <Axes: title={'center': 'Delaware'}>,
        <Axes: title={'center': 'District of Columbia'}>],
       [<Axes: title={'center': 'Florida'}>,
        <Axes: title={'center': 'Georgia'}>,
        <Axes: title={'center': 'Hawaii'}>,
        <Axes: title={'center': 'Idaho'}>,
        <Axes: title={'center': 'Illinois'}>,
        <Axes: title={'center': 'Indiana'}>,
        <Axes: title={'center': 'Iowa'}>,
        <Axes: title={'center': 'Kansas'}>,
        <Axes: title={'center': 'Kentucky'}>],
       [<Axes: title={'center': 'Louisiana'}>,
        <Axes: title={'center': 'Maine'}>,
        <Axes: title={'center': 'Maryland'}>,
        <Axes: title={'center': 'Massachusetts'}>,
        <Axes: title={'center': 'Michigan'}>,
        <Axes: title={'center': 'Minnesota'}>,
        <Axes: title={'center': 'Mississippi'}>,
        <Axes: title={'center': 'Missouri'}>,
        <Axes: title={'center': 'Montana'}>],
       [<Axes: title={'center': 'Nebraska'}>,
        <Axes: title={'center': 'Nevada'}>,
        <Axes: title={'center': 'New Hampshire'}>,
        <Axes: title={'center': 'New Jersey'}>,
        <Axes: title={'center': 'New Mexico'}>,
        <Axes: title={'center': 'New York'}>,
        <Axes: title={'center': 'North Carolina'}>,
        <Axes: title={'center': 'North Dakota'}>,
        <Axes: title={'center': 'Ohio'}>],
       [<Axes: title={'center': 'Oklahoma'}>,
        <Axes: title={'center': 'Oregon'}>,
        <Axes: title={'center': 'Pennsylvania'}>,
        <Axes: title={'center': 'Rhode Island'}>,
        <Axes: title={'center': 'South Carolina'}>,
        <Axes: title={'center': 'South Dakota'}>,
        <Axes: title={'center': 'Tennessee'}>,
        <Axes: title={'center': 'Texas'}>,
        <Axes: title={'center': 'Utah'}>],
       [<Axes: title={'center': 'Vermont'}>,
        <Axes: title={'center': 'Virginia'}>,
        <Axes: title={'center': 'Washington'}>,
        <Axes: title={'center': 'West Virginia'}>,
        <Axes: title={'center': 'Wisconsin'}>,
        <Axes: title={'center': 'Wyoming'}>, <Axes: >, <Axes: >,
        <Axes: >]], dtype=object)
```



In [24]:
```
!jupyter nbconvert --to pdf Big_data_US_Violence_Data.ipynb
```

```
[NbConvertApp] Converting notebook Big_data_US_Violence_Data.ipynb to pdf
[NbConvertApp] Support files will be in Big_data_US_Violence_Data_files/
[NbConvertApp] Making directory ./Big_data_US_Violence_Data_files
[NbConvertApp] Making directory ./Big_data_US_Violence_Data_files
[NbConvertApp] Making directory ./Big_data_US_Violence_Data_files
[NbConvertApp] Making directory ./Big_data_US_Violence_Data_files
[NbConvertApp] Making directory ./Big_data_US_Violence_Data_files
[NbConvertApp] Making directory ./Big_data_US_Violence_Data_files
[NbConvertApp] Writing 57068 bytes to notebook.tex
[NbConvertApp] Building PDF
Traceback (most recent call last):
  File "/usr/local/bin/jupyter-nbconvert", line 8, in <module>
    sys.exit(main())
  File "/usr/local/lib/python3.9/dist-packages/jupyter_core/application.py",
line 277, in launch_instance
    return super().launch_instance(argv=argv, **kwargs)
  File "/usr/local/lib/python3.9/dist-packages/traitlets/config/application.
py", line 992, in launch_instance
    app.start()
  File "/usr/local/lib/python3.9/dist-packages/nbconvert/nbconvertapp.py", l
ine 423, in start
    self.convert_notebooks()
  File "/usr/local/lib/python3.9/dist-packages/nbconvert/nbconvertapp.py", l
ine 597, in convert_notebooks
    self.convert_single_notebook(notebook_filename)
  File "/usr/local/lib/python3.9/dist-packages/nbconvert/nbconvertapp.py", l
ine 560, in convert_single_notebook
    output, resources = self.export_single_notebook(
  File "/usr/local/lib/python3.9/dist-packages/nbconvert/nbconvertapp.py", l
ine 488, in export_single_notebook
    output, resources = self.exporter.from_filename(
  File "/usr/local/lib/python3.9/dist-packages/nbconvert/exporters/exporter.
py", line 189, in from_filename
    return self.from_file(f, resources=resources, **kw)
  File "/usr/local/lib/python3.9/dist-packages/nbconvert/exporters/exporter.
py", line 206, in from_file
    return self.from_notebook_node(
  File "/usr/local/lib/python3.9/dist-packages/nbconvert/exporters/pdf.py",
line 194, in from_notebook_node
    self.run_latex(tex_file)
  File "/usr/local/lib/python3.9/dist-packages/nbconvert/exporters/pdf.py",
line 164, in run_latex
    return self.run_command(
  File "/usr/local/lib/python3.9/dist-packages/nbconvert/exporters/pdf.py",
line 111, in run_command
    raise OSError(
OSError: xelatex not found on PATH, if you have not installed xelatex you ma
y need to do so. Find further instructions at https://nbconvert.readthedocs.
io/en/latest/install.html#installing-tex.
```