statistics-state

March 13, 2023

[170]:
```
%matplotlib inline
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt

# Set some Pandas options
pd.set_option('display.max_columns', 20)
pd.set_option('display.max_rows', 25)

from datetime import datetime
```

[171]:
```
segments = pd.read_csv("covid19_superdata.csv")
```

[172]:
```
#get just the dates in wisconsin
wisconsin = segments[segments.StateFIPS==55].iloc[1:,4:-1]

#get population of state
#wi_pop = 0

wisconsin.head()
```

[172]:
```
      2020-01-22_x  2020-01-23_x  2020-01-24_x  2020-01-25_x  2020-01-26_x  \
3093             0             0             0             0             0
3094             0             0             0             0             0
3095             0             0             0             0             0
3096             0             0             0             0             0
3097             0             0             0             0             0

      2020-01-27_x  2020-01-28_x  2020-01-29_x  2020-01-30_x  2020-01-31_x  \
3093             0             0             0             0             0
3094             0             0             0             0             0
3095             0             0             0             0             0
3096             0             0             0             0             0
3097             0             0             0             0             0

      …  2023-01-27_y  2023-01-28_y  2023-01-29_y  2023-01-30_y  \
3093  …            70            70            70            70
3094  …            42            42            42            42
3095  …           153           153           153           153
3096  …            46            46            46            46
3097  …           620           620           620           620

      2023-01-31_y  2023-02-01_y  2023-02-02_y  2023-02-03_y  2023-02-04_y  \
3093            70            70            70            70            70
3094            42            42            42            42            42
3095           153           153           153           153           153
3096            46            46            46            46            46
3097           620           620           620           620           620

      2023-02-05_y
3093            70
3094            42
3095           153
3096            46
3097           620

[5 rows x 2222 columns]
```

0.1 Weekly Case Info:

[185]:

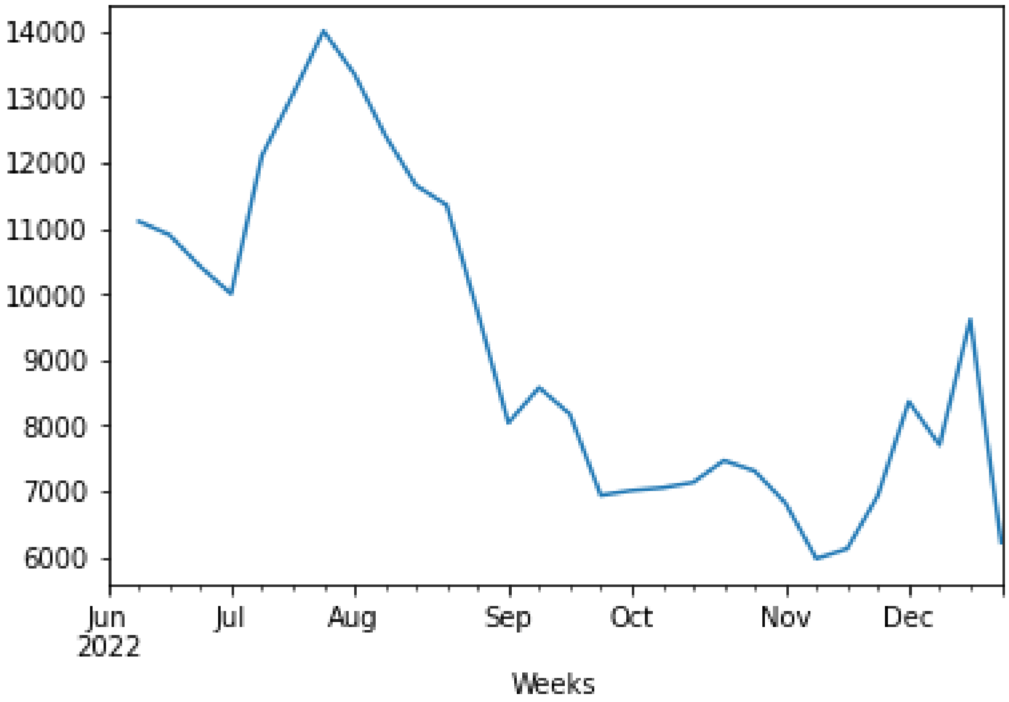
```
#remove suffixes and convert to datetime
wi_cases = wisconsin.filter(regex='_x')
wi_cases.columns = wi_cases.columns.str.rstrip('_x')
wi_cases.columns = pd.to_datetime(wi_cases.columns)
#wi_cases = wi_cases.loc[:, '2022-06-01':'2022-12-31']
wi_cases_week = wi_cases.T.reset_index()
wi_cases_week = wi_cases_week.assign(Weeks = wi_cases_week['index']).
 ↪drop(columns = 'index')
wi_cases_week['Weeks'] = wi_cases_week['Weeks'].astype('datetime64[ns]')

#get mean cases per week
wi_cases_week_mean = wi_cases_week.resample('W-Mon', label='left', closed =␣
 ↪'left', on='Weeks').mean(numeric_only=True)
wi_cases_week_mean = wi_cases_week_mean.loc['2022-06-01':'2022-12-31', :]
wi_cases_new_week_mean = wi_cases_week_mean.sum(axis=1).diff()
```

[186]:

```
wi_cases_new_week_mean.plot()
```

[186]:

```
<Axes: xlabel='Weeks'>
```

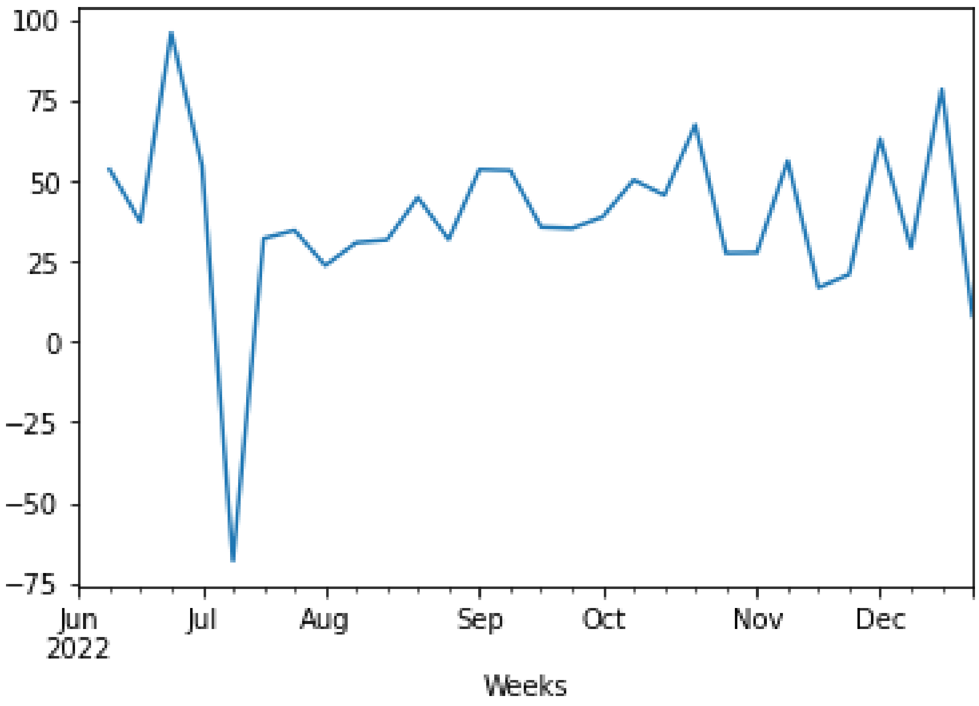


0.2 Weekly Death Info:

```
[187]: #remove suffixes and convert to datetime
wi_deaths = wisconsin.filter(regex='_y')
wi_deaths.columns = wi_deaths.columns.str.rstrip('_y')
wi_deaths.columns = pd.to_datetime(wi_deaths.columns)
#wi_deaths = wi_deaths.loc[:, '2022-06-01':'2022-12-31']
wi_deaths_week = wi_deaths.T.reset_index()
wi_deaths_week = wi_deaths_week.assign(Weeks = wi_deaths_week['index']).
 ↪drop(columns = 'index')
wi_deaths_week['Weeks'] = wi_deaths_week['Weeks'].astype('datetime64[ns]')

#get mean deaths per week
wi_deaths_week_mean = wi_deaths_week.resample('W-Mon', label='left', closed =␣
 ↪'left', on='Weeks').mean()
wi_deaths_week_mean = wi_deaths_week_mean.loc['2022-06-01':'2022-12-31', :]
wi_deaths_new_week_mean = wi_deaths_week_mean.sum(axis=1).diff()
```

```
[188]: wi_deaths_new_week_mean.plot()
```

```
[188]: <Axes: xlabel='Weeks'>
```



0.3 Case Data Compared to Three More States:

[181]:

```
#get just the dates in utah (UT)
utah = segments[segments.StateFIPS==49].iloc[1:,4:-1]

#remove suffixes and convert to datetime
ut_cases = utah.filter(regex='_x')
ut_cases.columns = ut_cases.columns.str.rstrip('_x')
ut_cases.columns = pd.to_datetime(ut_cases.columns)
ut_cases_week = ut_cases.T.reset_index()
ut_cases_week = ut_cases_week.assign(Weeks = ut_cases_week['index']).drop(columns = 'index')
ut_cases_week['Weeks'] = ut_cases_week['Weeks'].astype('datetime64[ns]')

#get mean cases per week
ut_cases_week_mean = ut_cases_week.resample('W-Mon', label='left', closed = 'left', on='Weeks').mean(numeric_only=True)
ut_cases_week_mean = ut_cases_week_mean.loc['2022-06-01':'2022-12-31', :]
ut_cases_new_week_mean = ut_cases_week_mean.sum(axis=1).diff()


#get just the dates in nebraska (NE)
nebraska = segments[segments.StateFIPS==31].iloc[1:,4:-1]
```

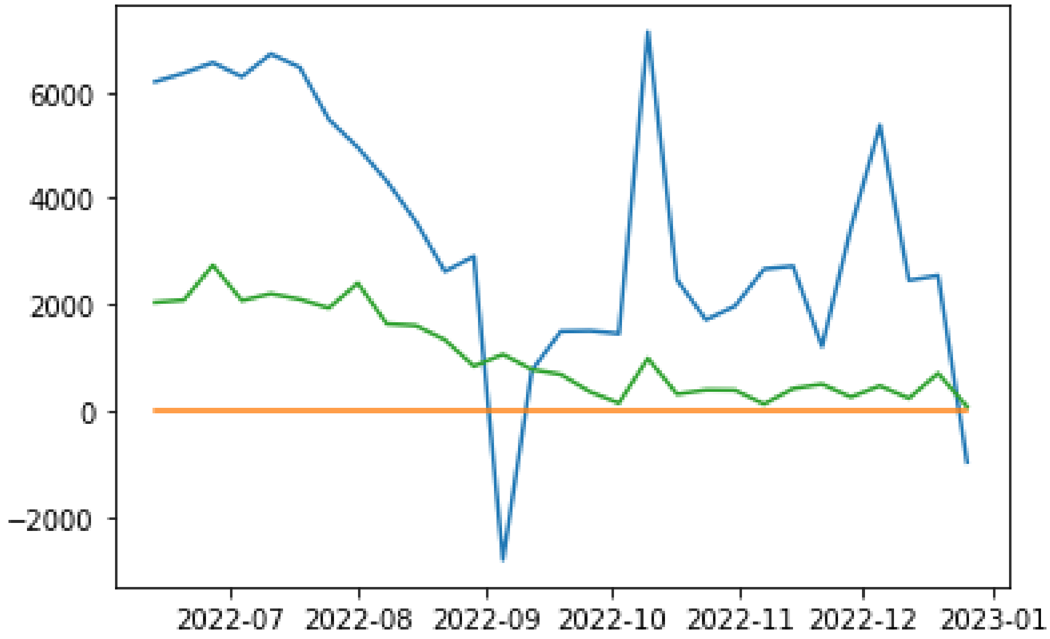
```
#remove suffixes and convert to datetime
ne_cases = nebraska.filter(regex='_x')
ne_cases.columns = ne_cases.columns.str.rstrip('_x')
ne_cases.columns = pd.to_datetime(ne_cases.columns)
ne_cases_week = ne_cases.T.reset_index()
ne_cases_week = ne_cases_week.assign(Weeks = ne_cases_week['index']).
 ↪drop(columns = 'index')
ne_cases_week['Weeks'] = ne_cases_week['Weeks'].astype('datetime64[ns]')

#get mean cases per week
ne_cases_week_mean = ne_cases_week.resample('W-Mon', label='left', closed =␣
 ↪'left', on='Weeks').mean(numeric_only=True)
ne_cases_week_mean = ne_cases_week_mean.loc['2022-06-01':'2022-12-31', :]
ne_cases_new_week_mean = ne_cases_week_mean.sum(axis=1).diff()


#get just the dates in alaska (AK)
alaska = segments[segments.StateFIPS==2].iloc[1:,4:-1]

#remove suffixes and convert to datetime
ak_cases = alaska.filter(regex='_x')
ak_cases.columns = ak_cases.columns.str.rstrip('_x')
ak_cases.columns = pd.to_datetime(ak_cases.columns)
ak_cases_week = ak_cases.T.reset_index()
ak_cases_week = ak_cases_week.assign(Weeks = ak_cases_week['index']).
 ↪drop(columns = 'index')
ak_cases_week['Weeks'] = ak_cases_week['Weeks'].astype('datetime64[ns]')

#get mean cases per week
ak_cases_week_mean = ak_cases_week.resample('W-Mon', label='left', closed =␣
 ↪'left', on='Weeks').mean(numeric_only=True)
ak_cases_week_mean = ak_cases_week_mean.loc['2022-06-01':'2022-12-31', :]
ak_cases_new_week_mean = ak_cases_week_mean.sum(axis=1).diff()
```

[182]:

```
#mean data across the three states
fig1 = plt.figure()
ax1 = fig1.add_subplot()

ax1.plot(ut_cases_new_week_mean)
ax1.plot(ne_cases_new_week_mean)
ax1.plot(ak_cases_new_week_mean)
```

[182]:

```
[<matplotlib.lines.Line2D at 0x7f40a1333610>]
```



0.4 Deaths Data Compared to Three More States:

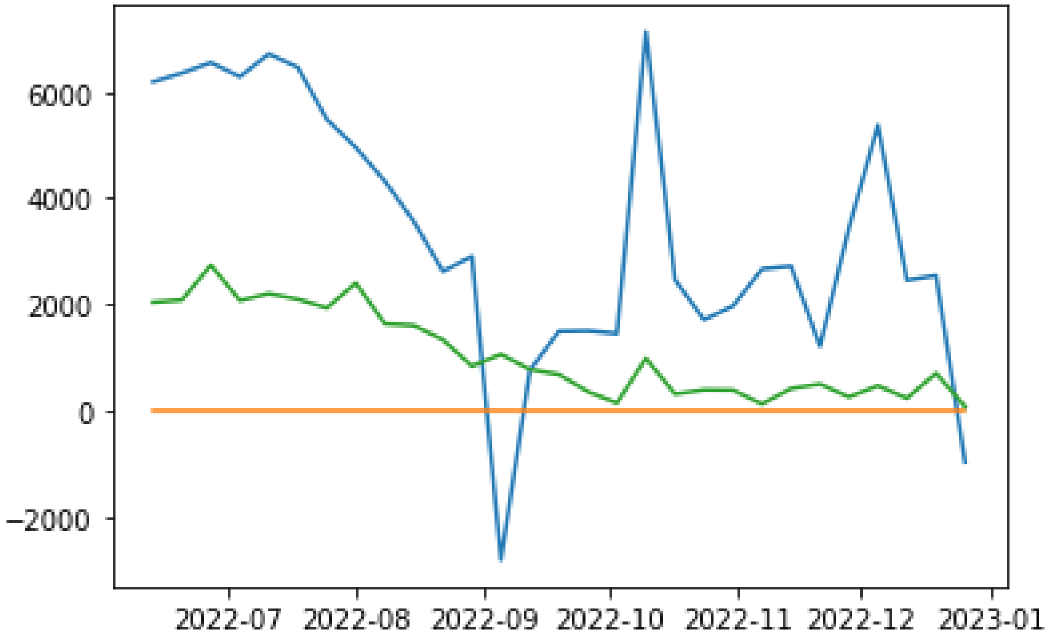
[183]:
```
#utah
#remove suffixes and convert to datetime
ut_deaths = utah.filter(regex='_x')
ut_deaths.columns = ut_deaths.columns.str.rstrip('_x')
ut_deaths.columns = pd.to_datetime(ut_deaths.columns)
ut_deaths_week = ut_deaths.T.reset_index()
ut_deaths_week = ut_deaths_week.assign(Weeks = ut_deaths_week['index']).
 ↪drop(columns = 'index')
ut_deaths_week['Weeks'] = ut_deaths_week['Weeks'].astype('datetime64[ns]')

#get mean deaths per week
ut_deaths_week_mean = ut_deaths_week.resample('W-Mon', label='left', closed =␣
 ↪'left', on='Weeks').mean(numeric_only=True)
ut_deaths_week_mean = ut_deaths_week_mean.loc['2022-06-01':'2022-12-31', :]
ut_deaths_new_week_mean = ut_deaths_week_mean.sum(axis=1).diff()



#nebraska
#remove suffixes and convert to datetime
ne_deaths = nebraska.filter(regex='_x')
ne_deaths.columns = ne_deaths.columns.str.rstrip('_x')
ne_deaths.columns = pd.to_datetime(ne_deaths.columns)
ne_deaths_week = ne_deaths.T.reset_index()
ne_deaths_week = ne_deaths_week.assign(Weeks = ne_deaths_week['index']).
 ↪drop(columns = 'index')
ne_deaths_week['Weeks'] = ne_deaths_week['Weeks'].astype('datetime64[ns]')

#get mean deaths per week
ne_deaths_week_mean = ne_deaths_week.resample('W-Mon', label='left', closed =␣
 ↪'left', on='Weeks').mean(numeric_only=True)
ne_deaths_week_mean = ne_deaths_week_mean.loc['2022-06-01':'2022-12-31', :]
ne_deaths_new_week_mean = ne_deaths_week_mean.sum(axis=1).diff()



#alaska
#remove suffixes and convert to datetime
ak_deaths = alaska.filter(regex='_x')
ak_deaths.columns = ak_deaths.columns.str.rstrip('_x')
ak_deaths.columns = pd.to_datetime(ak_deaths.columns)
ak_deaths_week = ak_deaths.T.reset_index()
ak_deaths_week = ak_deaths_week.assign(Weeks = ak_deaths_week['index']).
 ↪drop(columns = 'index')
ak_deaths_week['Weeks'] = ak_deaths_week['Weeks'].astype('datetime64[ns]')

#get mean deaths per week
ak_deaths_week_mean = ak_deaths_week.resample('W-Mon', label='left', closed =␣
 ↪'left', on='Weeks').mean(numeric_only=True)
ak_deaths_week_mean = ak_deaths_week_mean.loc['2022-06-01':'2022-12-31', :]
ak_deaths_new_week_mean = ak_deaths_week_mean.sum(axis=1).diff()
```

[184]:

```
#mean data across the three states
fig1 = plt.figure()
ax1 = fig1.add_subplot()

ax1.plot(ut_deaths_new_week_mean)
ax1.plot(ne_deaths_new_week_mean)
ax1.plot(ak_deaths_new_week_mean)
```

[184]:

```
[<matplotlib.lines.Line2D at 0x7f40a03a5fd0>]
```


6000
4000
2000
0
−2000
2022-07
2022-08
2022-09
2022-10
2022-11
2022-12
2023-01

```
[ ]:
```