

Public Assistance

March 12, 2021

1 Group Assignment 3

In this notebook I wanted to look at one particular variable, Public assistance before COVID-19. I want to acknowledge that public assistance can mean different types of assistance, housing, health care, and CalFresh

```
[1]: # Importing libraries
import urllib.request, json
import pandas as pd
import geopandas as gpd
import contextily as ctx
import matplotlib.pyplot as plt
import pandas as pd
import plotly.express as px
from sodapy import Socrata
import numpy as np
```

```
[2]: # Uploading the dataframe
pubassist = gpd.read_file('publicassisacs2019_5yr_B19057_14000US06037534001.
                           ↪geojson')
```

```
[3]: # Checking to see what was uploaded
pubassist.head()
```

```
[3]:          geoid                         name    B19057001 \
0      05000US06037                      Los Angeles County, CA  3316795.0
1  14000US06037101110  Census Tract 1011.10, Los Angeles, CA     1575.0
2  14000US06037101122  Census Tract 1011.22, Los Angeles, CA     1312.0
3  14000US06037101210  Census Tract 1012.10, Los Angeles, CA     2297.0
4  14000US06037101220  Census Tract 1012.20, Los Angeles, CA     1357.0

   B19057001, Error  B19057002  B19057002, Error  B19057003  B19057003, Error \
0            5782.0    112441.0             2009.0    3204354.0            5958.0
1             90.0       95.0              46.0     1480.0             96.0
2             63.0       17.0              22.0     1295.0             67.0
3             98.0      147.0              75.0     2150.0            131.0
4             57.0       57.0              41.0     1300.0             69.0
```

```
geometry
0 MULTIPOLYGON (((-118.70339 34.16859, -118.7033...
1 MULTIPOLYGON (((-118.30229 34.25870, -118.3009...
2 MULTIPOLYGON (((-118.30334 34.27371, -118.3033...
3 MULTIPOLYGON (((-118.29945 34.25598, -118.2979...
4 MULTIPOLYGON (((-118.28593 34.25227, -118.2859...
```

```
[3]: # Dropping the first row that is the overall LA County Population
pubassist = pubassist.drop ([0])
```

```
[4]: # Keeping only the necessary columns
columns_to_keep = ['geoid',
                    'name',
                    'B19057001',
                    'B19057002',
                    'B19057003',
                    'geometry']
```

```
[5]: pubassist = pubassist[columns_to_keep]
```

```
[6]: # naming columns based on metadata
pubassist.columns= ['geoid',
                    'name',
                    'Total',
                    'With public assistance income',
                    'No public assistance income',
                    'geometry']
```

```
[8]: # Checking to make sure the column names changed.
pubassist.head ()
```

```
geoid name Total \
1 14000US06037101110 Census Tract 1011.10, Los Angeles, CA 1575.0
2 14000US06037101122 Census Tract 1011.22, Los Angeles, CA 1312.0
3 14000US06037101210 Census Tract 1012.10, Los Angeles, CA 2297.0
4 14000US06037101220 Census Tract 1012.20, Los Angeles, CA 1357.0
5 14000US06037101300 Census Tract 1013, Los Angeles, CA 1445.0

With public assistance income No public assistance income \
1 95.0 1480.0
2 17.0 1295.0
3 147.0 2150.0
4 57.0 1300.0
5 10.0 1435.0

geometry
1 MULTIPOLYGON (((-118.30229 34.25870, -118.3009...
```

```

2 MULTIPOLYGON (((-118.30334 34.27371, -118.3033...
3 MULTIPOLYGON (((-118.29945 34.25598, -118.2979...
4 MULTIPOLYGON (((-118.28593 34.25227, -118.2859...
5 MULTIPOLYGON (((-118.27822 34.25068, -118.2782...

```

[7]: # Here I want to make the numbers more digestible by converting them to
→percentages and creating new columns.

```

pubassist['Percent With public assistance income'] = pubassist['With public assistance income']/pubassist['Total']*100
pubassist['Percent No public assistance income'] = pubassist['No public assistance income']/pubassist['Total']*100

```

[10]: # checking to make sure they were created.

```
pubassist.head ()
```

| | geoid | name | Total | \ |
|---|--------------------|---------------------------------------|--------|---|
| 1 | 14000US06037101110 | Census Tract 1011.10, Los Angeles, CA | 1575.0 | |
| 2 | 14000US06037101122 | Census Tract 1011.22, Los Angeles, CA | 1312.0 | |
| 3 | 14000US06037101210 | Census Tract 1012.10, Los Angeles, CA | 2297.0 | |
| 4 | 14000US06037101220 | Census Tract 1012.20, Los Angeles, CA | 1357.0 | |
| 5 | 14000US06037101300 | Census Tract 1013, Los Angeles, CA | 1445.0 | |

| | With public assistance income | No public assistance income | \ |
|---|-------------------------------|-----------------------------|---|
| 1 | 95.0 | 1480.0 | |
| 2 | 17.0 | 1295.0 | |
| 3 | 147.0 | 2150.0 | |
| 4 | 57.0 | 1300.0 | |
| 5 | 10.0 | 1435.0 | |

| | geometry | \ |
|---|---|---|
| 1 | MULTIPOLYGON (((-118.30229 34.25870, -118.3009... | |
| 2 | MULTIPOLYGON (((-118.30334 34.27371, -118.3033... | |
| 3 | MULTIPOLYGON (((-118.29945 34.25598, -118.2979... | |
| 4 | MULTIPOLYGON (((-118.28593 34.25227, -118.2859... | |
| 5 | MULTIPOLYGON (((-118.27822 34.25068, -118.2782... | |

| | Percent With public assistance income | Percent No public assistance income |
|---|---------------------------------------|-------------------------------------|
| 1 | 6.031746 | 93.968254 |
| 2 | 1.295732 | 98.704268 |
| 3 | 6.399652 | 93.600348 |
| 4 | 4.200442 | 95.799558 |
| 5 | 0.692042 | 99.307958 |

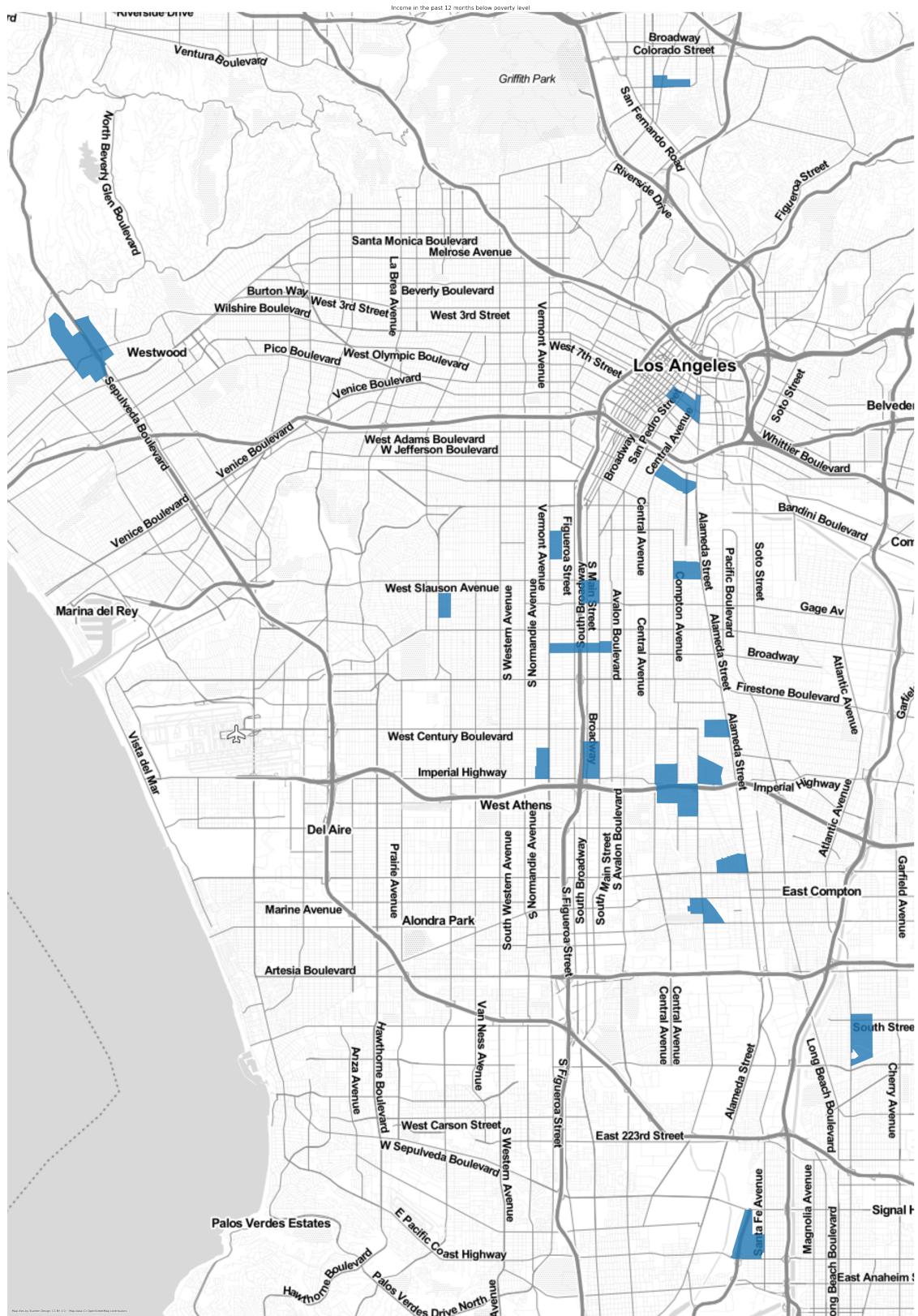
- 1.1 The goal of this notebook is to narrow down potential areas to analyze and help create indicators considering neighbors/census tracts already experiencing burden and comparing that to the job loss due to covid based on the different occupations and industries hit hardest by covid-19.

Below I begin mapping out the data to get an idea of the landscape.

```
[8]: # Bring in mapping app.  
pubassist_web_mercator = pubassist.to_crs(epsg=3857)
```

- 1.1.1 Below I wanted to look at the census tracks that have more than 15% of individuals with on public assistance to get an idea of where the percentages. 15% seemed high to me and I decided to see where it lie.

```
[9]: fig, ax = plt.subplots(figsize=(70, 70))  
  
pubassist_web_mercator[pubassist_web_mercator['Percent With public assistance' ↴income'] > 15].plot(ax=ax, alpha=0.8)  
  
ax.axis('off')  
  
ax.set_title('Censis tracks with 15% of individuals with Public Assistance', fontsize=16)  
  
ctx.add_basemap(ax, source=ctx.providers.Stamen.TonerLite)
```



There aren't too many census tracks with 15% of individuals on public assistance. I wanted to get a better sense of the actual stats of the data frame. Below I sort the data and also run a .describe to get mean and other stat information.

```
[13]: pubassist_sorted = pubassist.sort_values(by='Percent With public assistance income', ascending = False)
```

```
[14]: pubassist_sorted.head ()
```

```
[14]:          geoid           name   Total \
537  14000US06037206300  Census Tract 2063, Los Angeles, CA  2433.0
2119 14000US06037701100  Census Tract 7011, Los Angeles, CA    48.0
821  14000US06037242600  Census Tract 2426, Los Angeles, CA 1381.0
818  14000US06037242100  Census Tract 2421, Los Angeles, CA   751.0
824  14000US06037243100  Census Tract 2431, Los Angeles, CA 1530.0

      With public assistance income  No public assistance income \
537                      639.0                  1794.0
2119                     12.0                   36.0
821                      341.0                  1040.0
818                      183.0                  568.0
824                      363.0                  1167.0

          geometry \
537  MULTIPOLYGON (((-118.25041 34.04326, -118.2490...
2119  MULTIPOLYGON (((-118.46889 34.06587, -118.4687...
821  MULTIPOLYGON (((-118.25425 33.93097, -118.2542...
818  MULTIPOLYGON (((-118.23675 33.94491, -118.2367...
824  MULTIPOLYGON (((-118.23904 33.93027, -118.2390...

      Percent With public assistance income \
537                      26.263872
2119                     25.000000
821                      24.692252
818                      24.367510
824                      23.725490

      Percent No public assistance income
537                      73.736128
2119                     75.000000
821                      75.307748
818                      75.632490
824                      76.274510
```

```
[26]: pubassist.describe ()
```

```
[26]:
```

| | Total | With public assistance income | \ |
|-------|-------------|-------------------------------|---|
| count | 2346.000000 | 2346.000000 | |
| mean | 1413.808610 | 47.928815 | |
| std | 616.966186 | 46.327908 | |
| min | 0.000000 | 0.000000 | |
| 25% | 1011.250000 | 16.000000 | |
| 50% | 1339.000000 | 36.000000 | |
| 75% | 1728.000000 | 67.000000 | |
| max | 5663.000000 | 639.000000 | |

| | No public assistance income | Percent With public assistance income | \ |
|-------|-----------------------------|---------------------------------------|---|
| count | 2346.000000 | 2319.000000 | |
| mean | 1365.879795 | 3.678367 | |
| std | 610.269879 | 3.441175 | |
| min | 0.000000 | 0.000000 | |
| 25% | 970.000000 | 1.177397 | |
| 50% | 1288.500000 | 2.752294 | |
| 75% | 1678.000000 | 5.170624 | |
| max | 5663.000000 | 26.263872 | |

| | Percent No public assistance income | |
|-------|-------------------------------------|--|
| count | 2319.000000 | |
| mean | 96.321633 | |
| std | 3.441175 | |
| min | 73.736128 | |
| 25% | 94.829376 | |
| 50% | 97.247706 | |
| 75% | 98.822603 | |
| max | 100.000000 | |

```
[31]: def get_histogram(column = 'With public assistance income'):
    series_to_plot=pubassist[column]

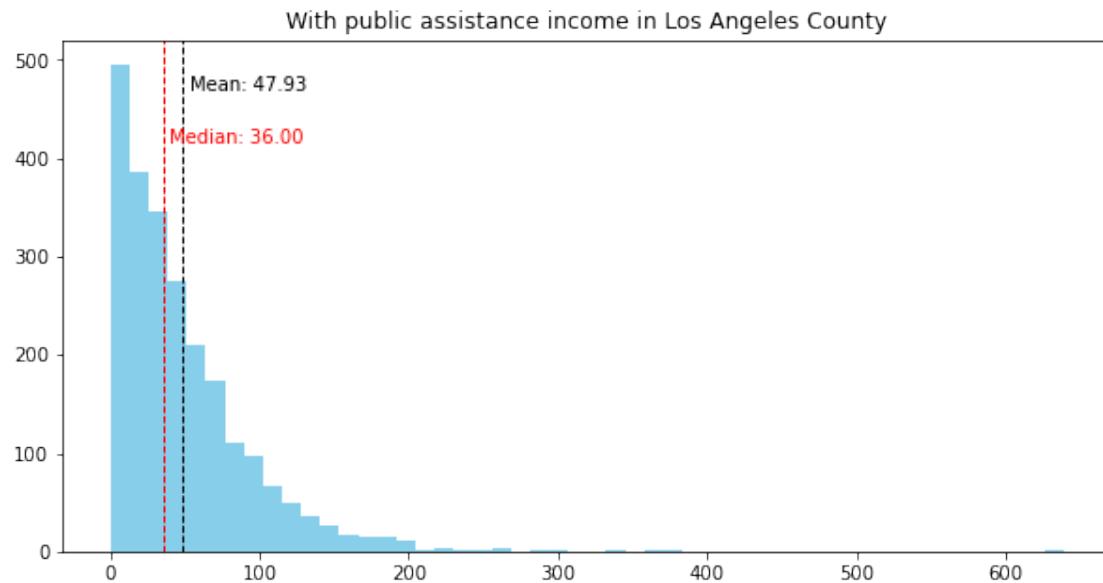
    plt.figure(figsize=(10,5))

    plt.hist(series_to_plot,bins=50,color='skyblue')

    plt.axvline(series_to_plot.mean(), color='k', linestyle='dashed', linewidth=1)
    plt.axvline(series_to_plot.median(), color='r', linestyle='dashed', linewidth=1)

    min_ylim, max_ylim = plt.ylim()
    plt.text(series_to_plot.mean()*1.1, max_ylim*0.9, 'Mean: {:.2f}'.format(series_to_plot.mean()))
    plt.text(series_to_plot.median()*1.1, max_ylim*0.8, 'Median: {:.2f}'.format(series_to_plot.median()),color='r')
    plt.title(column + ' in Los Angeles County')
```

```
get_histogram ()
```



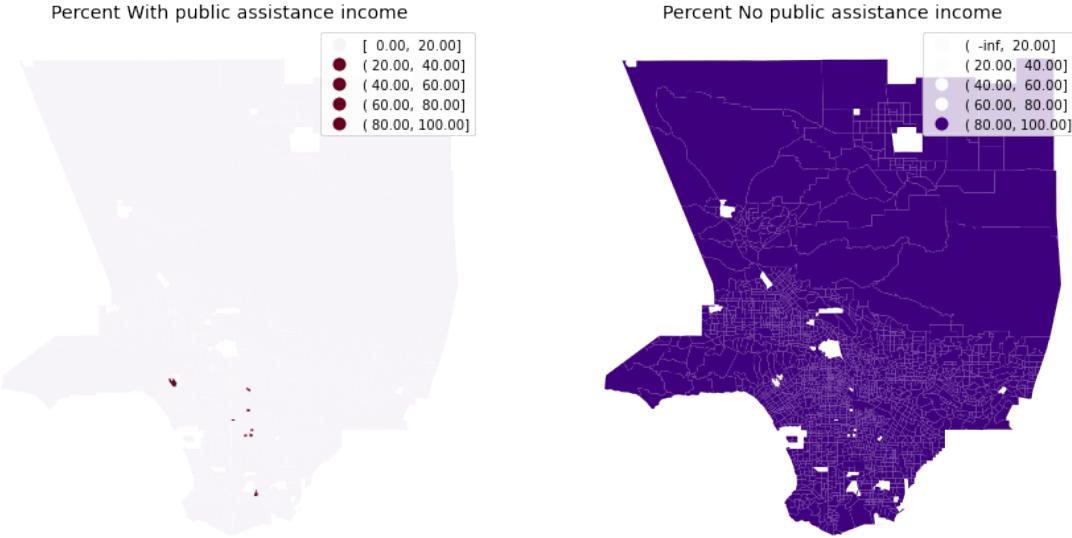
```
[19]: column1 = 'Percent With public assistance income'
column2 = 'Percent No public assistance income'
fig,ax = plt.subplots(1,2,figsize=(15,8))

pubassist.plot(ax=ax[0],
               column=column1,
               legend=True,
               scheme='user_defined',
               classification_kwds={'bins':[20,40,60,80,100]},
               cmap='PuRd'
              )

ax[0].set_ylim(33.6,34.9)
ax[0].set_title(column1, fontsize=14)
ax[0].axis('off');

pubassist.plot(ax=ax[1],
               column=column2,
               legend=True,
               scheme='user_defined',
               classification_kwds={'bins':[20,40,60,80,100]},
               cmap='Purples'
              )
```

```
ax[1].set_ylim(33.6,34.9)
ax[1].set_title(column2, fontsize=14)
ax[1].axis('off');
```



[]:

[20]: # Council Districts

```
gdf_cd = gpd.read_file('http://boundaries.latimes.com/1.0/boundary-set/
↪la-city-council-districts-2012/?format=geojson')
```

[24]: # function to create a council district map

```
def cd_map(name = '9', column = 'Percent With public assistance income'):
    # this cd
    this_cd = gdf_cd[gdf_cd['name']==name]

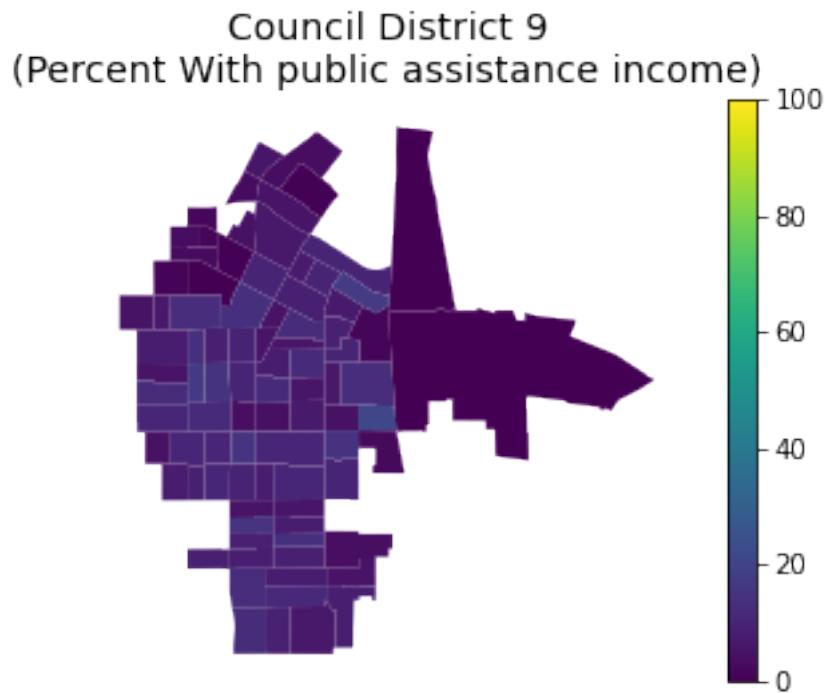
    # spatial join to get tracts
    tracts = gpd.sjoin(pubassist,this_cd)

    # plot it
    fig,ax = plt.subplots()

    # map
    tracts.plot(ax=ax,
                column=column,
                vmin=0,
                vmax=100,
                legend=True)
```

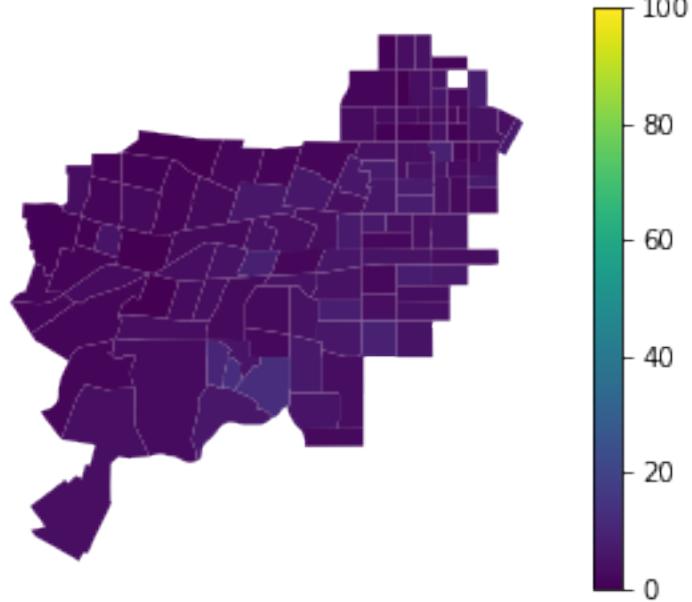
```
ax.axis('off')
ax.set_title('Council District ' + name + '\n(' + column + ')', fontsize=14)
```

[25]: cd_map ()

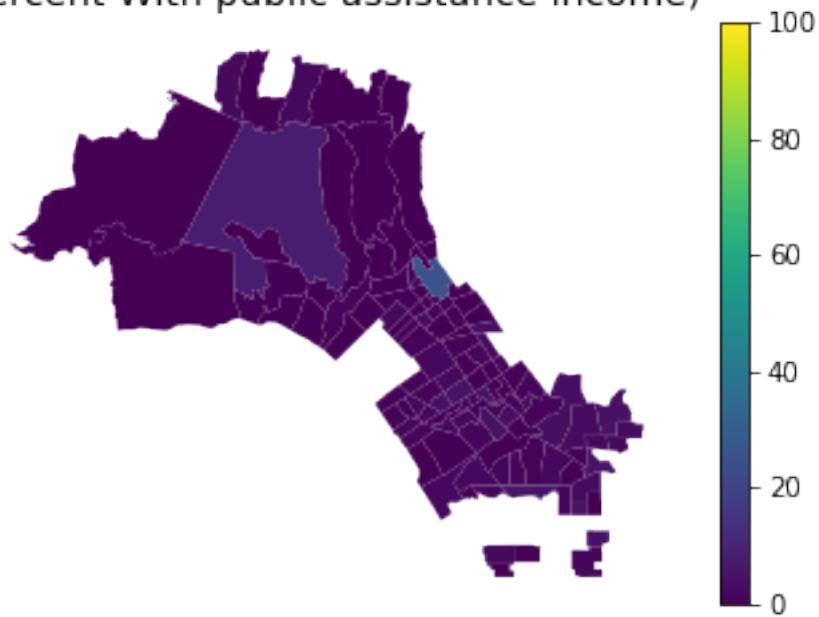


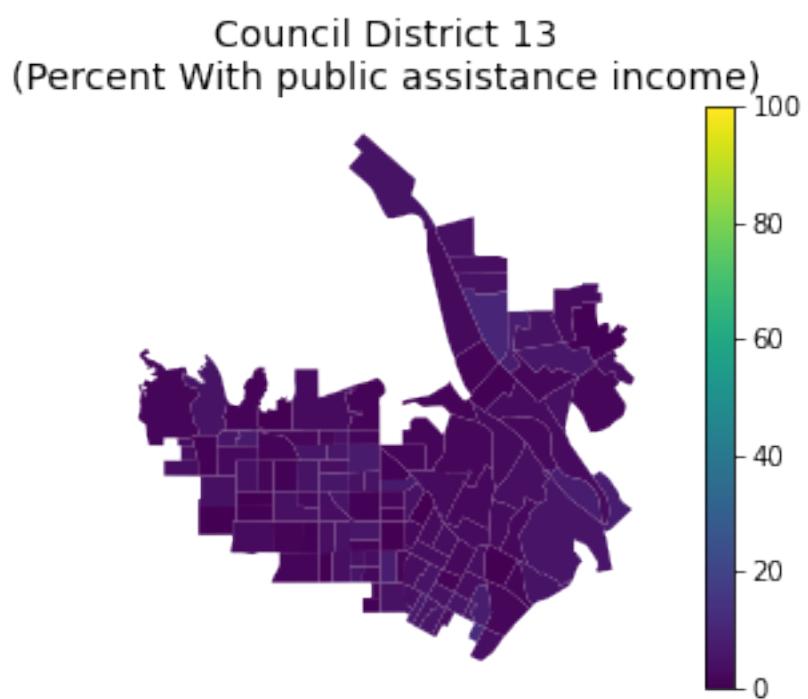
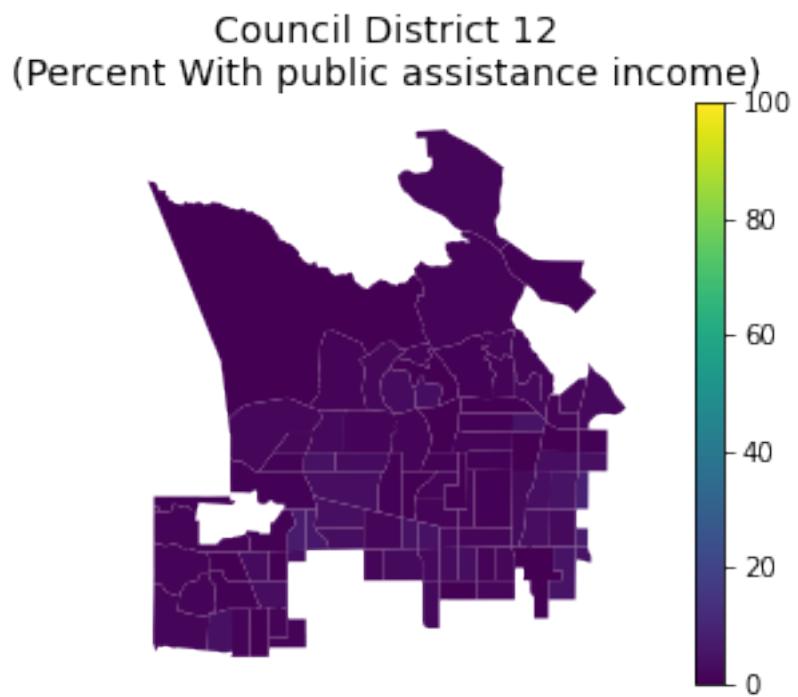
```
[23]: for index, row in gdf_cd.iterrows():
    cd_map(name = row['name'])
```

Council District 10
(Percent With public assistance income)

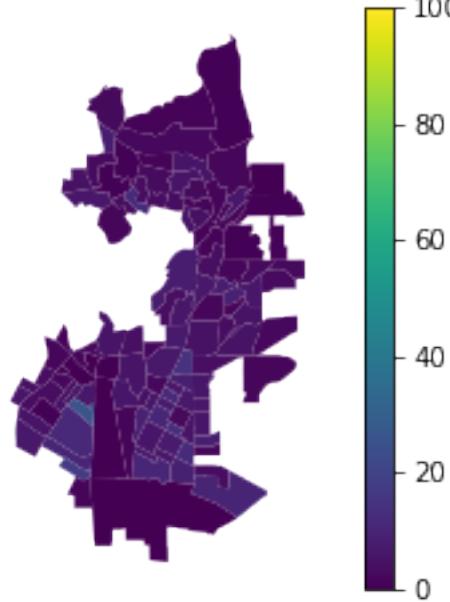


Council District 11
(Percent With public assistance income)

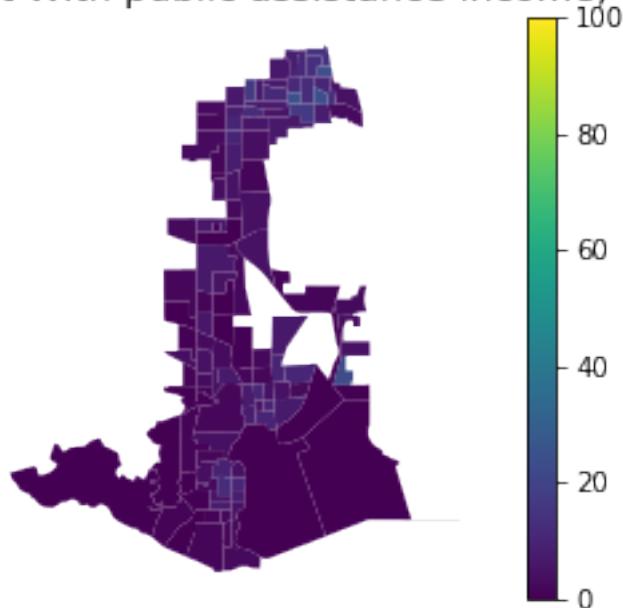




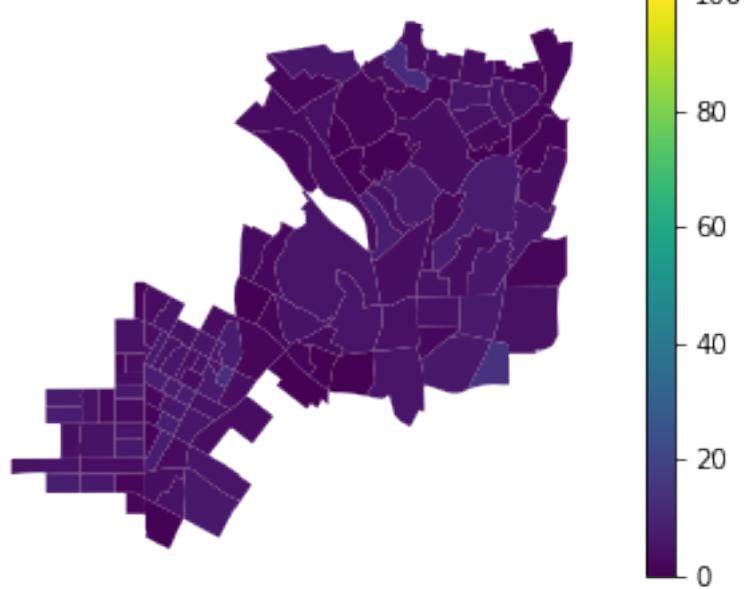
Council District 14
(Percent With public assistance income)



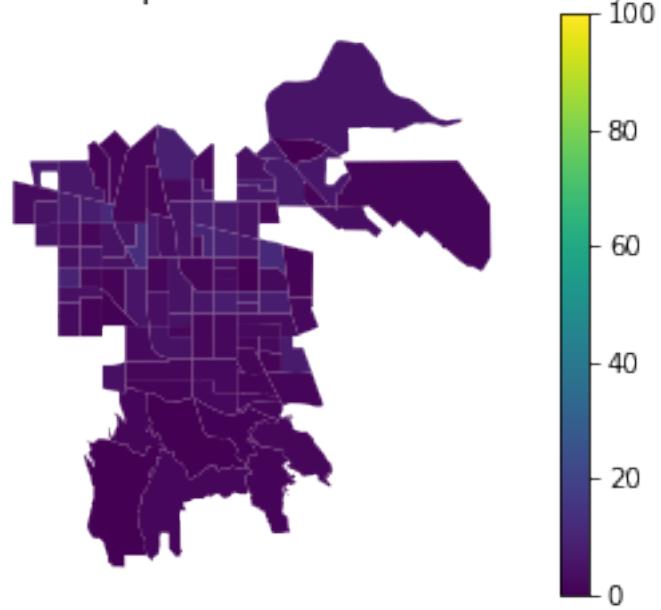
Council District 15
(Percent With public assistance income)

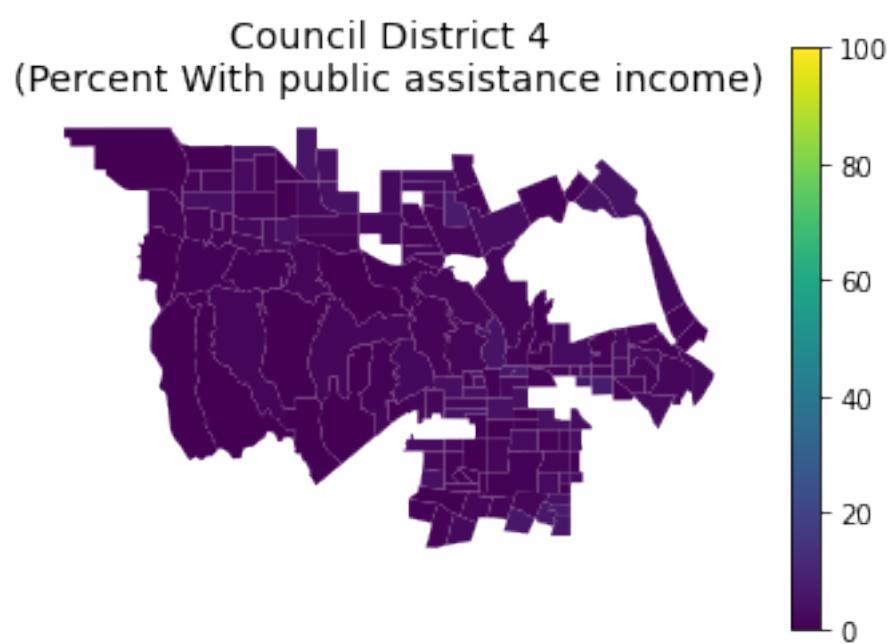
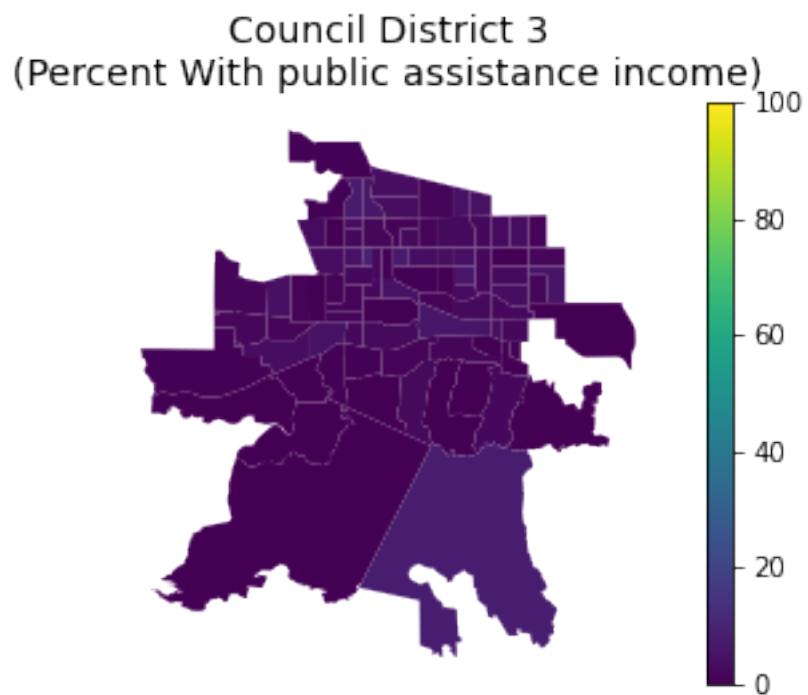


Council District 1
(Percent With public assistance income)



Council District 2
(Percent With public assistance income)

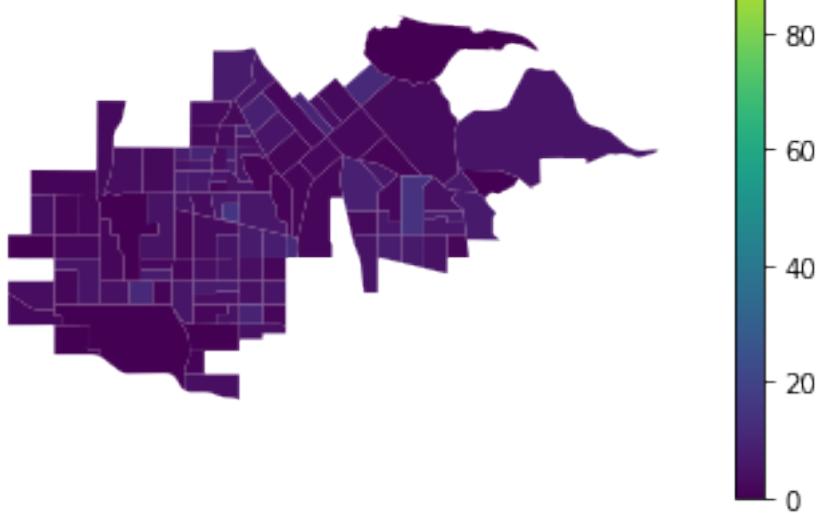


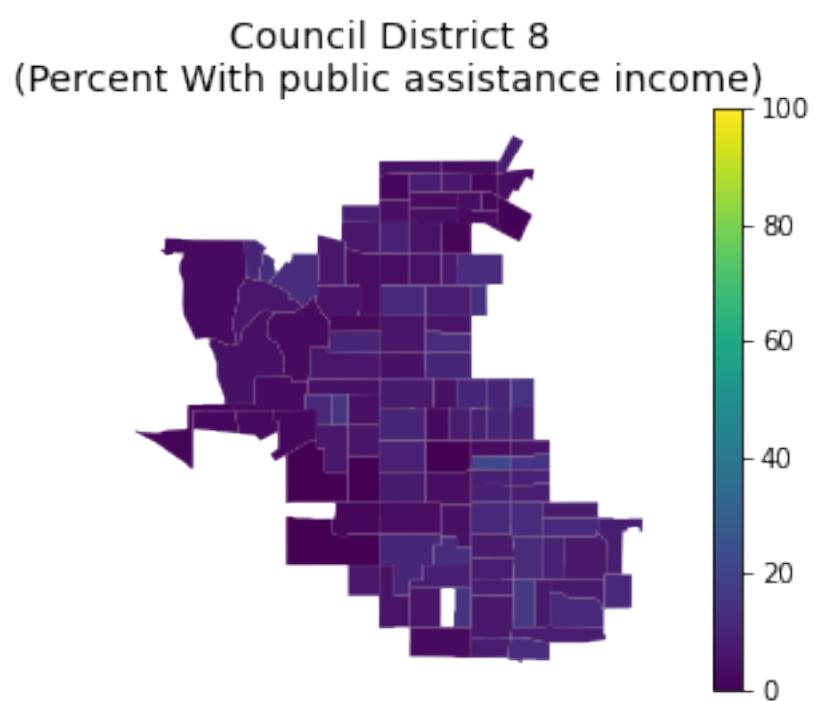
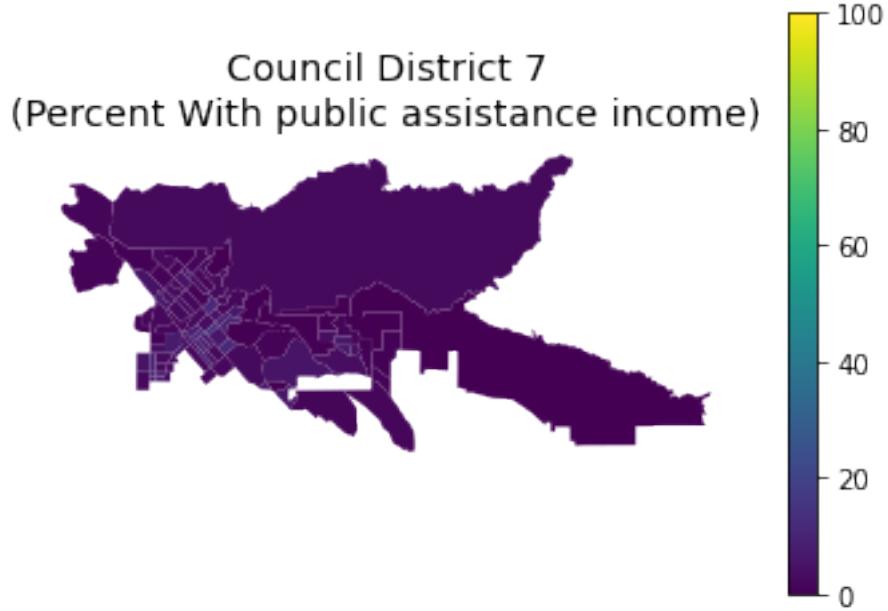


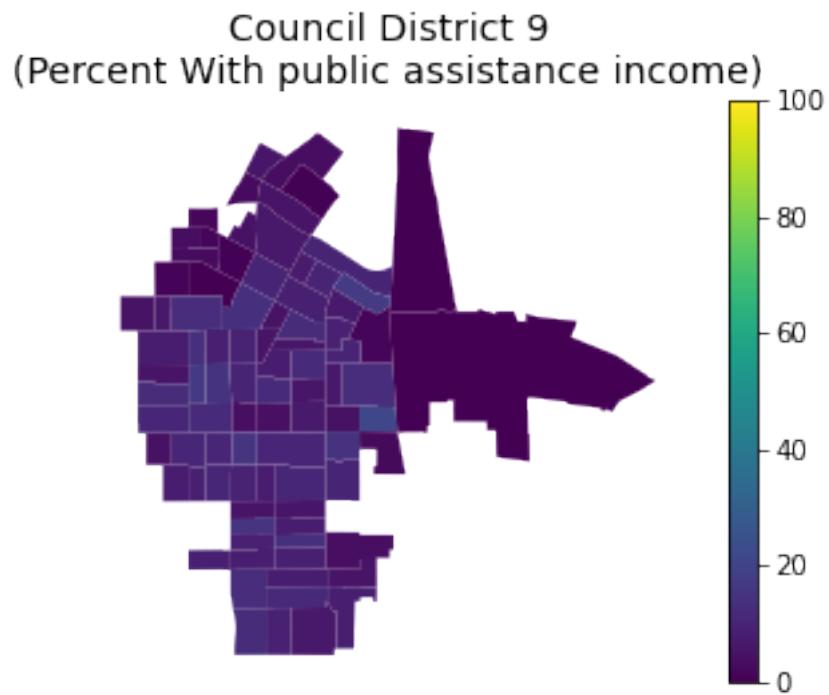
Council District 5
(Percent With public assistance income)



Council District 6
(Percent With public assistance income)







Link to [Notebook 2](#), where I'm starting to clean the data to narrow down my scope.

[]: