Homelessness

March 14, 2021

```
/Users/villalpando/Documents/Winter2021/DSTools/dst1_env/lib/python3.9/site-
packages/IPython/core/interactiveshell.py:3155: DtypeWarning: Columns (20) have
mixed types.Specify dtype option on import or set low_memory=False.
  has_raised = await self.run_ast_nodes(code_ast.body, cell_name,

/Users/villalpando/Documents/Winter2021/DSTools/dst1_env/lib/python3.9/site-
packages/IPython/core/interactiveshell.py:3155: DtypeWarning: Columns (21) have
mixed types.Specify dtype option on import or set low_memory=False.
  has_raised = await self.run_ast_nodes(code_ast.body, cell_name,
```

1 Homelessness in LA

It's no secret that homelessness has far surpassed the criteria of being labeled a crisis in the United States. In my own hometown of Los Angeles, the crisis has never been more apparent than today. With homelessness reaching all time highs in 2020, local and federal governments have shifted a lot of focus towards understanding the issue at hand so that solutions can be found.

Frankly, this is not a simple issue at all. I have come to learn that issue seems to stem from *multiple* factors. Many postulate that the issue of homelessness is directly linked to issues of mental health, race, population growth, the job market and unemployment, the War on Drugs, crime, and housing development. Unfortunately, none of these issues are rarely presented without dogma that detracts away from understanding that a crisis with multiple contributing factors requires multiple solutions.

This project will largely focus on homelessness in the county of Los Angeles, but there will be some comparisons made to other counties in the nation when having a look at potential solutions. Because of the scope of factors contributing to the evergrowing crisis, it would be far too large of an undertaking to evaluate *all* of them. I will be primarily focusing on testing two hypotheses that piqued my interest: slow housing development relative to population growth, and the crime rates of domestic violence and drug usage. In order to test these two hypotheses and provide adequate exploratory data analysis to demonstrate the severity of the crisis, this project will feature data spanning multiple sources.

2 The Data

For all datasets, missing values were largely discarded. For one, there is some disparity in years covered between all doucments used. Additionally, for the location data pulled from MyLA311, null values are useless for plotting.

2.1 The Department of Housing and Urban Development

The data related to homelessness available through city and federal governments is extensive, but much of its publicly available data is hard to find meaningful insight from in explaining demographic changes over the years. Seemingly, most resources spent on data collection related to homelessness simply involve *counts* of homeless people, with occasional categorization by factors such as race, gender, and age. The largest data collection related to homelessness is the country-wide "Point-in-Time count" (PIT) organized by the U.S. Department of Housing and Urban Development (HUD). This data collection is conducted by "Continuums of Care", which are district-wide bodies that, among other things, help homeless people transition towards permanent housing. The PIT count is largely done by volunteers–with Los Angeles boasting the largest effort in conducting the count. The data provided by these PIT counts will be used to show total numbers of homeless people from the years 2007-2020.

In addition to the PIT Count, each Continuum of Care in the nation is instructed by HUD to also gather extensive data on their inventory, as well as of conduct surveys on those who parttake in their services. With that data, they regularly issue reports on their findings. However, as useful as their reports are, the raw data–the surveys–is *not* available to the public. This significantly changes the level at which this project can evaluate outcomes as a result of policy or programs. Ideally, with access to this data, we could look at the effect local government solutions have at the individual level–a powerful capability. However, I will try to make due with higher level data from the countrywide census.

As for the inventory data they collect, it isn't particularly useful for the purposes in this project and will not be used, though knowledge of how their services are being used is incredibly important for the facilities themselves. They use this data to ensure their facilities are used to the highest capacity possible. For example, if occupancy of a CoC facility designed to be used by families is not at full capacity, but a woman's shelter is struggling to meet demand, said CoC facility will change its eligibility requirements to accomodate for other demographics.

Moreover, the focus of HUD's data collection is aimed more at serving those who are already experiencing homelessness, and doesn't provide much insight on *why* homeless demographics are everchanging.

2.2 MyLA311 Data

Simply for visuals to demonstrate how dramaticically the homelessness crisis has changed over the years, I gathered geospatial data from the city's MyLA311 database. MyLA311 is a hotline for reporting non emergencies throughout Los Angeles, including, among other things: illegal dumping, graffiti, excessive trash, and homeless encampments. While *reported* homeless encampments aren't entirely indicative of the problem of homelessness, it is still the most tangible measure for residents of Los Angeles. As encampments increasingly canopy the overpasses of our ever-crowded freeways, and our sidewalks that rarely receive foot traffic anyway are now impassable because of tents, the issue has never been more plainly obvious and in the public's face. The city of Los Angeles cannot *physically* look the other way anymore–the issue is (almost) everywhere. As we'll see, there are some well-guarded nieghborhoods in Los Angeles that have managed to keep the issue in their peripherals (and their commonality will most definitely *not* be surprising).

Additionally, this data gives us an idea of how much the unsheltered homeless population has changed in a nice visual format. Because 311 data includes *multiple* types of non-emergencies, the

data used is filtered to only include incidents involving homeless encampments. Another caveat to this dataset is that it only includes data for issues within Los Angeles Proper (i.e. the city itself)–more on this below.

2.3 US Census Data on Population and Housing Units

In order to gather insight on how housing affects homelessness, population and housing unit data from the 2010-2019 will be used. These tables will be joined, and then merged to a final dataset that includes homeless populations for each state. The purpose of this is to test how much available housing relative to population affects the homeless population, if at all.

3 Why LA?

First, let's have a look at the data and see some fairly obvious reasons why LA should be the focal point of the homelessness crisis in America.

California is currently the epicenter for homelessness in the United States (and territories). As of 2019, its homeless population totals 151,278–the largest homeless population in the United States.

Highest 25 Homeless Populations by State, 2019
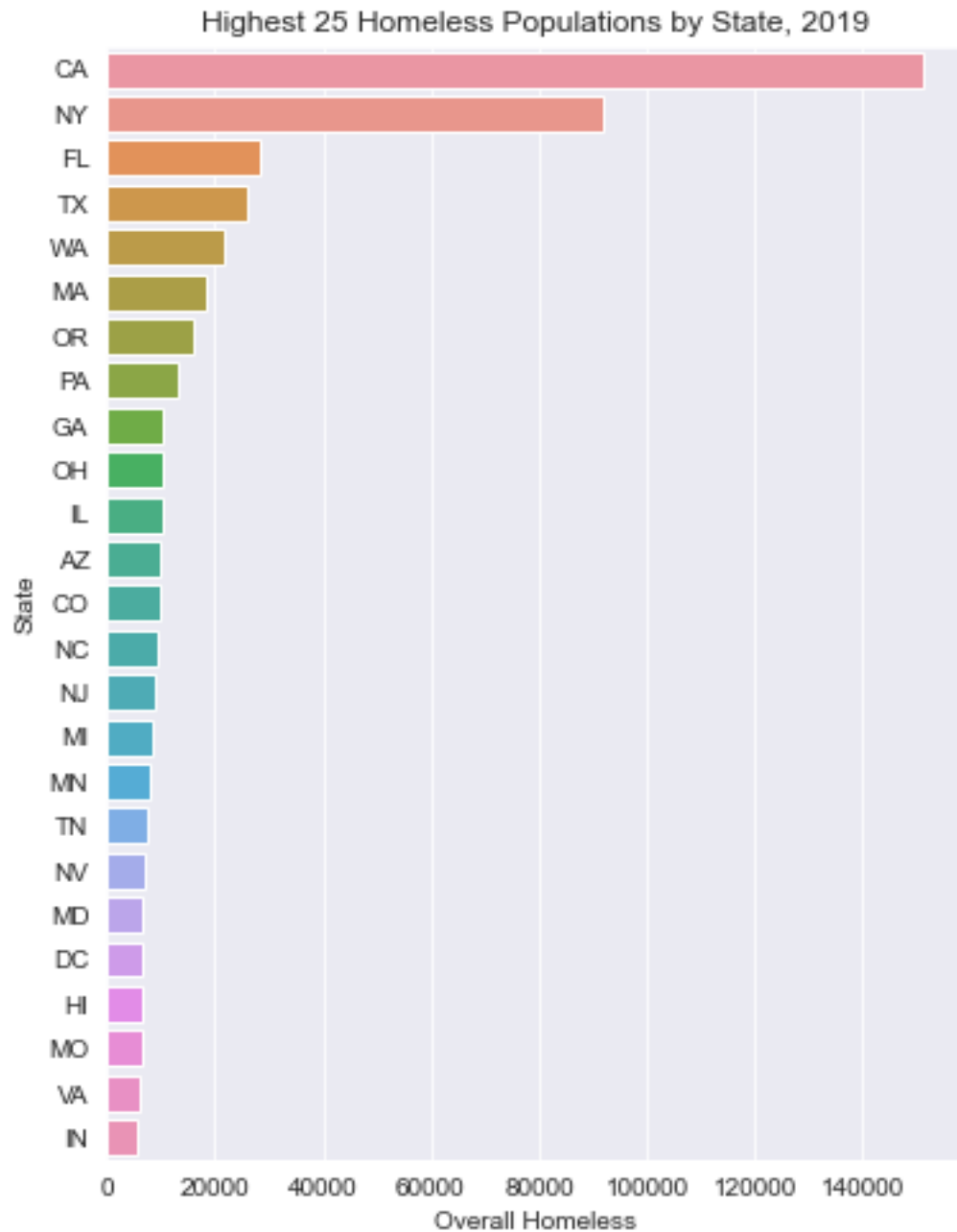
Here, we can see that California completely eclipses the homeless population of any other state. Additionally, the problem doesn't seem to be slowing down with upticks in recent years:

Homeless Population by year in California, 2007-2019

151278

To go one level deeper, of those 151,278 homeless people living in California, Los Angeles holds the highest proportion of that total with 56,257 homeless individuals as of 2019–an approximately 18% change since 2007.

Total Number of Homeless People in LA County from 2007-2019
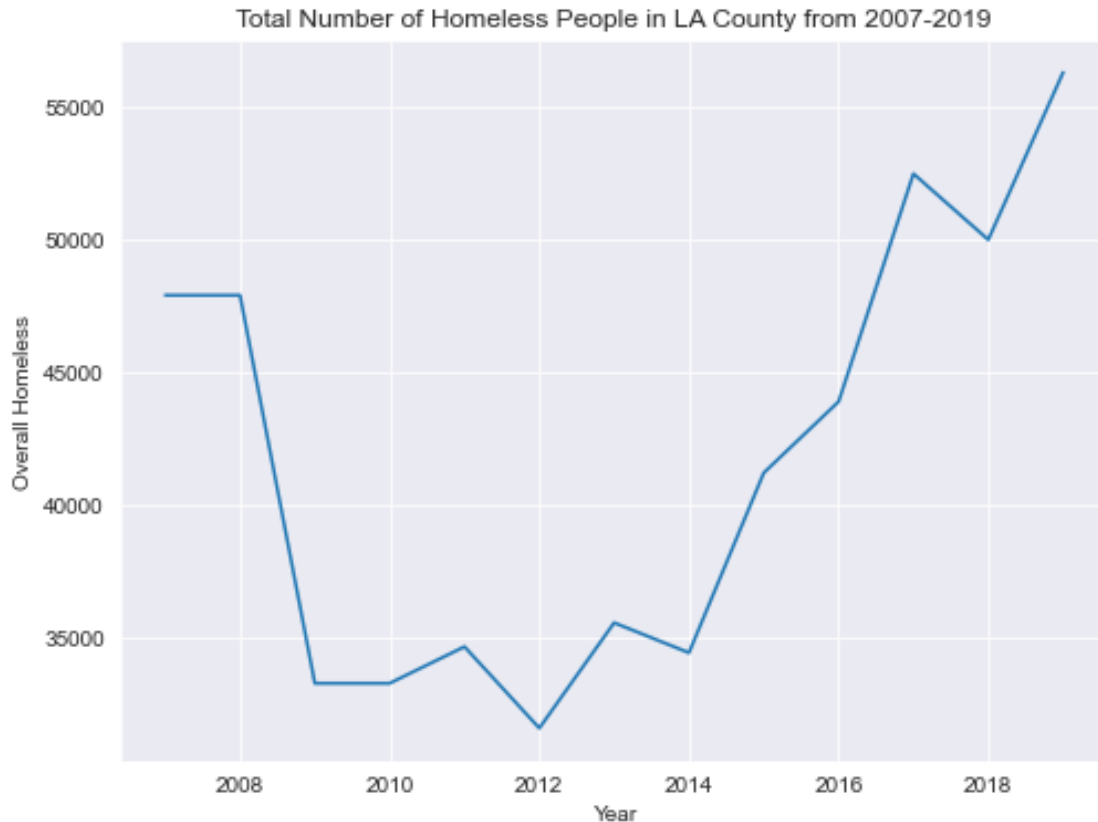
3.1 Mapped Data of Homeless Encampments

Using the data from MyLA311's non-emergency reports related to homeless encampments, the data shows that number of encampments and unsheltered subpopulation of homeless people is also increasing.

[463]: `<function matplotlib.pyplot.show(close=None, block=None)>`

Above is a map of " Los Angeles Proper" (Courtesy of "ZeeMaps"), in other words, the city of Los Angeles itself. Because 311 only accounts for data within LA Proper, we can only plot coords for homeless encampments within those boundaries. Surely, though, the problem is much bigger than the data would suggest if we were to evaluate the county as a whole. Here, we can see the location of encampments for the year 2016:

Homeless Encampments in LA, 2016
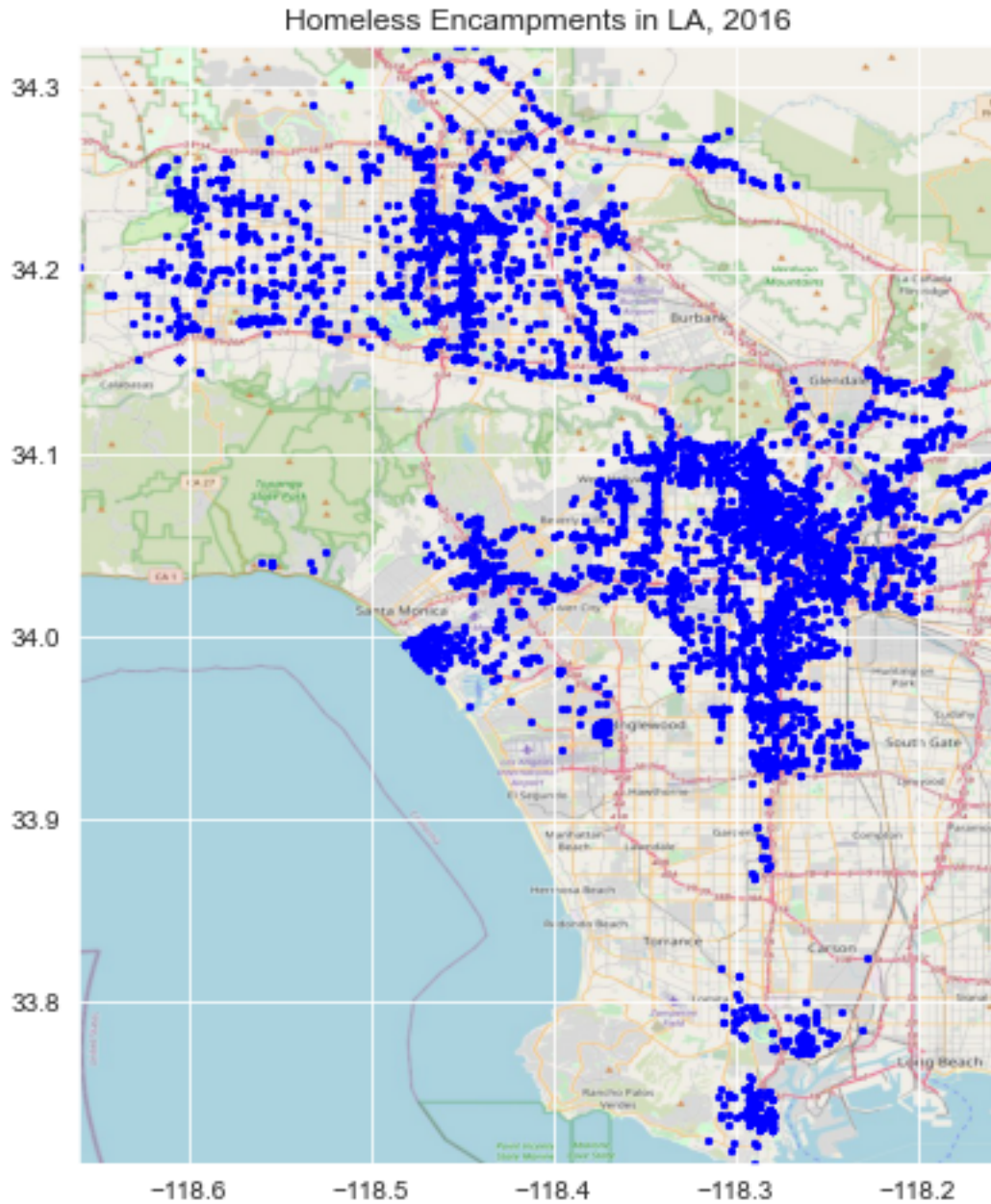
As expected, for 2020 the crisis is only amplifying, with areas that were already populated with encampments becoming even more dense, and newer areas within the city becoming annexed. Curiously, Beverley Hills' borders seem to be well-protected as always–along with those of more affluent neighborhoods such as Larchmont and Brentwood.

Homeless Encampments in LA, 2020
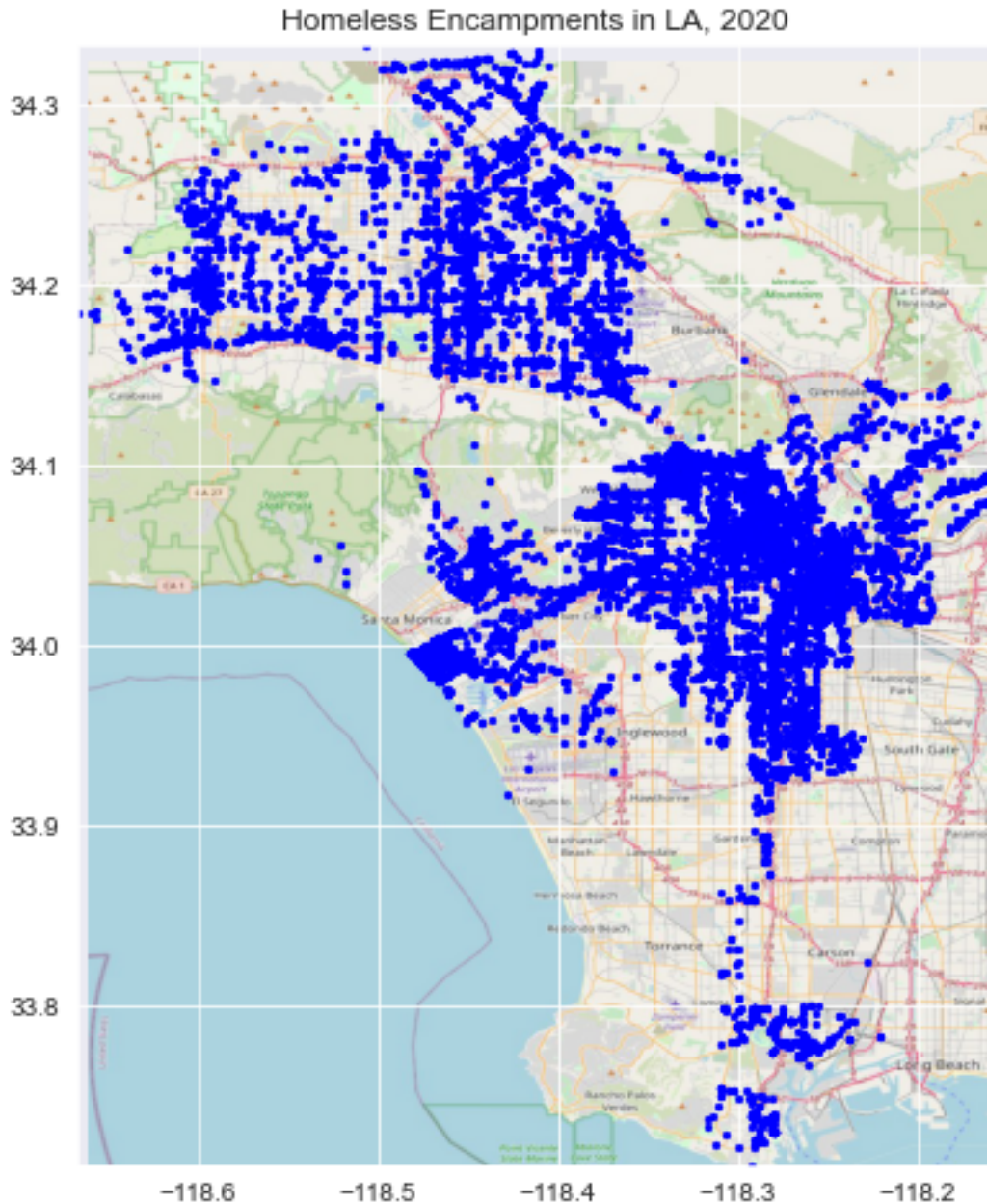
4 The Fight: Literature Review on How LA is Responding to the Crisis

Per Los Angeles Mayor Eric Garcetti's website, there's a very clear outline on what the city believes is the cause of homelessness as well as their solutions to them (full details here: https://www.lamayor.org/HomelessnessCausesAndResponses). Of these causes and solutions, the city has adopted a "Housing First" approach to combatting homelessness and allocates a majority of its resources towards this. While I applaud the city's noble efforts with this approach, and would

never argue against such housing assistance, I have my doubts that this is anything more than a band-aid. For one, it does not address the very causes outlined by the city. Additionally, a study by Cusack and Montgomery (2017) on Veterans who received housing assistance shows that recidivism (i.e. returning to homelessness) is highly probable even with housing assistance. Of course, this only speaks to a subset of the homeless population

Housing First is an approach that is often dogmatically prescribed as being a mutually exclusive solution with its supposed counterpart: Treatment First. In the Treatment First approach, individuals experiencing homelessness are provided with services that address issues that caused an individual to be homeless in the first place, such as drug or mental health treatment before receiving housing assistance. I find the juxtaposition between the two to be a bit overplayed, as research on the demographics of homelessness reveals that it is unfounded that homelessness is *primarily* an issue of mental health or drug usage. Like other factors, they're one small piece of the puzzle.

While the jury is still out on COVID-19's effect on the homeless population, Blasi (2020) purports that the effects will be *significantly* underplayed in the data-to-come because of the state's (noble) freezing of legal evictions for nonpayment since April 6, 2020. As Blasi points out, the Judicial Council or the Governor "can lift the freeze at any time." With record unemployment spikes due to the pandemic, 2021 is unlikely to look any better if and when the freeze is lifted.

5 The Effect of Housing Development on Homelessness

In this section, I want to address perhaps the most important aspect of the city's attempt to address the housing issue. The Mayor has spearheaded a plan to accelerate the development of new housing in general–not just for those experiencing homelessness. To accomplish this task, I'll start with a precursory look at data for the City and County of Los Angeles. More specifically, I've created a feature in the data to show Persons per Household so that we can see the relationship between that metric and the Overall Homeless population. Below, we can see that the total housing units from 2010-2019 in LA has increased by 573,391.

```
[443]:        Continuum of Care Name  Year  Overall Homeless  Population Total  \
      3   Los Angeles City & County CoC  2010             33243        30764188.0
      4   Los Angeles City & County CoC  2011             34622        31086714.0
      5   Los Angeles City & County CoC  2012             31553        31506091.0
      6   Los Angeles City & County CoC  2013             35524        31858521.0
      7   Los Angeles City & County CoC  2014             34393        32110077.0
      8   Los Angeles City & County CoC  2015             41174        32385073.0
      9   Los Angeles City & County CoC  2016             43854        32628187.0
      10  Los Angeles City & County CoC  2017             52442        32870570.0
      11  Los Angeles City & County CoC  2018             49955        33051381.0
      12  Los Angeles City & County CoC  2019             56257        33163325.0

          Housing Total  Persons per Household
      3      11187787.0                 2.7498
      4      11233387.0                 2.7674
      5      11292199.0                 2.7901
      6      11342703.0                 2.8087
      7      11395169.0                 2.8179
```

8	11458347.0	2.8263
9	11523164.0	2.8315
10	11605749.0	2.8323
11	11688063.0	2.8278
12	11761178.0	2.8197

This is an admittedly incredibly small sample size. The amount of housing created has far surpassed Eric Garetti's goals for housing development, but I'm not entirely sure it paints the whole picture due to the small sample size. The Persons per Household ratio in Los Angeles is 2.8197 as of 2019, which surpasses that of the nation as a whole at 2.62. As we can see below, even such minor increments in the ratio of Persons per Household (Housing Total / Population Total) seems to hold as a strong predictor of the Overall Homeless population.
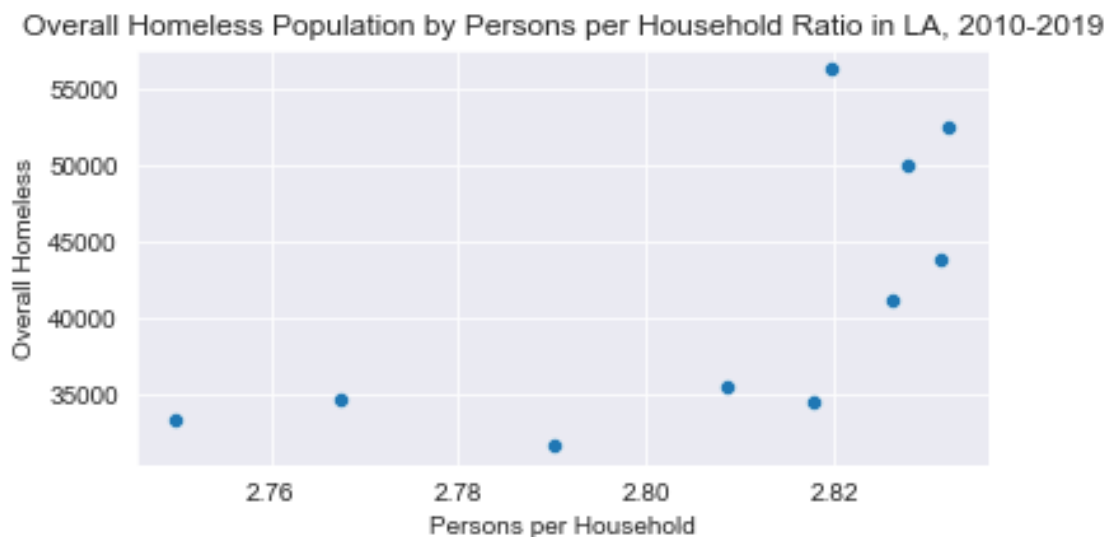
My findings here are not meant to discredit the acceleration of housing creation, but clearly, it hasn't been enough. Perhaps we are still playing catch-up in keeping up with the nationwide average, as population growth still outweighs the city's ability to create new housing. Let's examing the same data, but nation-wide. To accomplish this, I will first create a table by joining data from the table agg_df to a newly created table from Census data that includes the population and housing unit counts for each state, for each year. Here is how the agg_df table looks like, which we'll be appending data to:

[445]:

	State	Year	Overall Homeless
187	ID	2012	1968
636	VI	2016	341
83	CT	2012	4209
141	GA	2018	9499
398	NE	2012	3789

Finally, after a lot of data cleaning and merging of tables, here is the final table which will be used to create another plot showing the relationship of Persons per Household and Homeless Populations

and its corresponding plot. In order to show a more honest representation of the data, another feature has been created: "Percent Homeless", which shows the proportion of homeless people to the State's population as a whole

```
[449]:      State  Year  Overall Homeless  Housing Units  Population  \
       0       AK  2010              1863         307181      713910
       1       AK  2011              2128         308498      722128
       2       AK  2012              1913         310002      730443
       3       AK  2013              1946         311243      737068
       4       AK  2014              1784         312396      736283
       ..      ..    ...               ...            ...         ...
       505     WY  2015               798         273221      585613
       506     WY  2016               857         275045      584215
       507     WY  2017               873         276708      578931
       508     WY  2018               639         278568      577601
       509     WY  2019               548         280291      578759

            Persons per Household  Percent Homeless
       0                 232.4070          0.002610
       1                 234.0787          0.002947
       2                 235.6253          0.002619
       3                 236.8143          0.002640
       4                 235.6890          0.002423
       ..                     ...               ...
       505               214.3367          0.001363
       506               212.4071          0.001467
       507               209.2209          0.001508
       508               207.3465          0.001106
       509               206.4850          0.000947

       [510 rows x 7 columns]
```


Overall Homeless Population by Persons per Household Ratio, USA 2010-2019
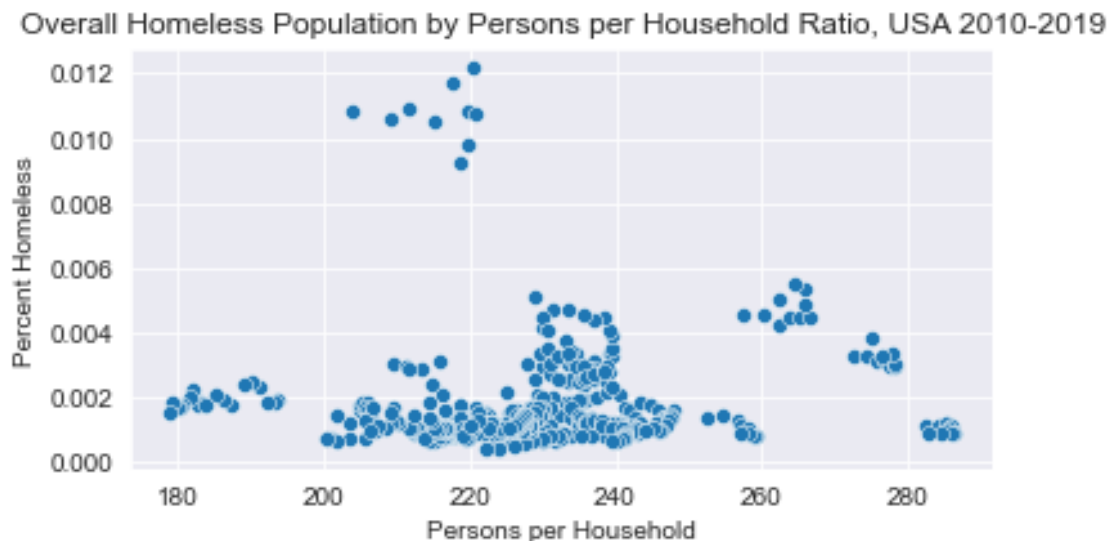
There is *some* semblance of a linear relation between the two variables, however, the relation is muddled by the outliers towards the top of the plot. With some filtering of the table, we can find out which State accounts for those outliers: Washington D.C.

```
[451]:     State  Year  Overall Homeless  Housing Units  Population  \
       70    DC  2010              6539         296688      605226
       71    DC  2011              6546         296365      619800
       72    DC  2012              6954         299822      634924
       73    DC  2013              6865         302495      650581
       74    DC  2014              7748         304590      662328
       75    DC  2015              7298         307566      675400
       76    DC  2016              8350         311257      685815
       77    DC  2017              7473         314702      694906
       78    DC  2018              6904         319462      701547
       79    DC  2019              6521         322793      705749

           Persons per Household  Percent Homeless
       70               203.9941          0.010804
       71               209.1340          0.010561
       72               211.7670          0.010952
       73               215.0717          0.010552
       74               217.4490          0.011698
       75               219.5951          0.010805
       76               220.3372          0.012175
       77               220.8140          0.010754
       78               219.6026          0.009841
       79               218.6383          0.009240
```

Now that we're aware that DC has an abnormally high proportion of homeless people, let's try the same graph again without DC included to see if that paints a clearer picture:

Overall Homeless Population by Persons per Household Ratio, USA 2010-2019
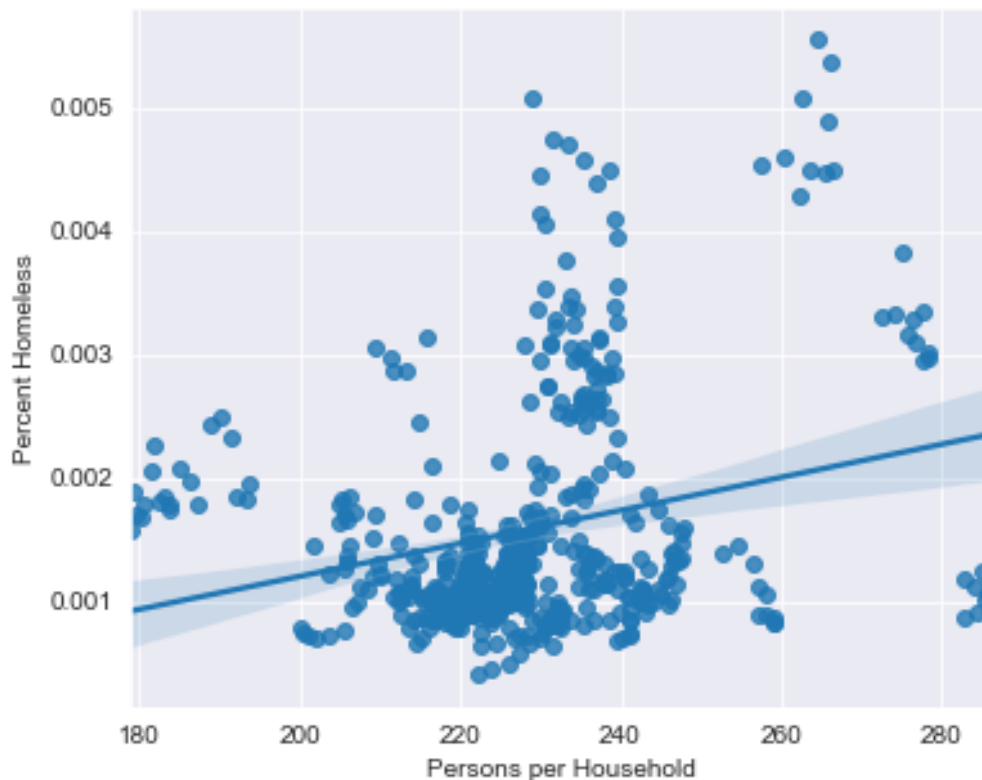
As we can see, the ratio of Persons per Household most definitely *does* have an affect on the Homeless Population, but given disparity between the scope of this project and all the known factors of homelessness, it would not be wise to say that it's the *primary* contribution factor. More research is needed, especially at the individual care level, to evaluate the effectiveness of public policy and ultimately better combat the crisis.

```
[NbConvertApp] Converting notebook Homelessness.ipynb to pdf
[NbConvertApp] Support files will be in Homelessness_files/
[NbConvertApp] Making directory ./Homelessness_files
[NbConvertApp] Making directory ./Homelessness_files
[NbConvertApp] Making directory ./Homelessness_files
[NbConvertApp] Making directory ./Homelessness_files
[NbConvertApp] Making directory ./Homelessness_files
[NbConvertApp] Making directory ./Homelessness_files
[NbConvertApp] Making directory ./Homelessness_files
[NbConvertApp] Making directory ./Homelessness_files
[NbConvertApp] Writing 42906 bytes to ./notebook.tex
[NbConvertApp] Building PDF
[NbConvertApp] Running xelatex 3 times: ['xelatex', './notebook.tex', '-quiet']
[NbConvertApp] Running bibtex 1 time: ['bibtex', './notebook']
[NbConvertApp] WARNING | bibtex had problems, most likely because there were no
```

```
citations
[NbConvertApp] PDF successfully created
[NbConvertApp] Writing 944164 bytes to Homelessness.pdf
```