

Fall 2025

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Income Inequality In Chicago

Motivation

Chicago is a city defined by its divisions.

North/South/West Sides

Income inequality is often linked with demographics.

I want to investigate how Gender impacts income trends in neighborhoods across Chicago.



Research Question

Does the percentage of female residents in a neighborhood predict household income trends?

Dataset

2023 American Community Survey

<https://www.kaggle.com/datasets/aniket0712/acs-5-year-data-by-community-area>

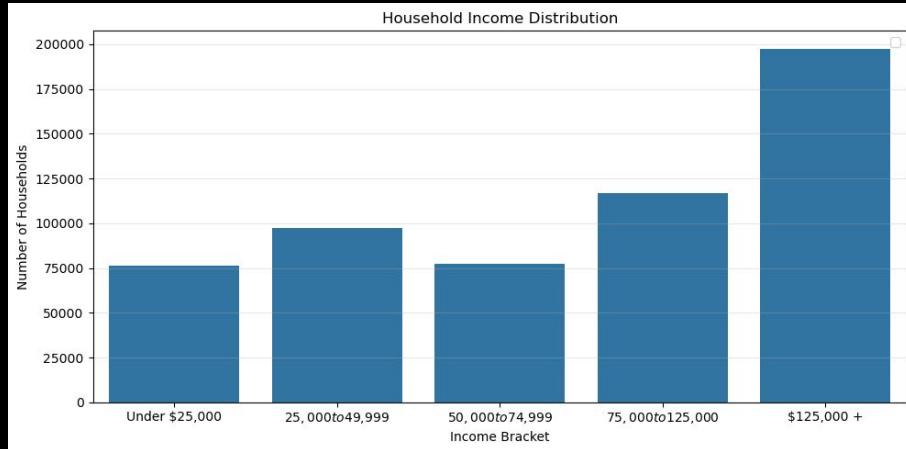
Contains demographic information for the 77 neighborhoods.

Income brackets from <25k to >125k+

Age/Gender brackets "Males 18 to 24"

Ethnicity: White/Black/Asian as well as Hispanic Yes/No

| ACS Year | Community Area | Under \$25,000 | \$25,000 to \$49,999 | \$50,000 to \$74,999 | \$75,000 to \$125,000 | \$125,000 + | Male 0 to 17 | Male 18 to 24 | Male 25 to 34 | Male 35 to 49 | Male 50 to 64 | Male 65+ | Female 0 to 17 | Female 18 to 24 | Female 25 to 34 | Female 35 to 49 | Female 50 to 64 | Female 65 + | Total Population | White | Black or African American | American Indian or Alaska Native | Asian |
|----------|---------------------|----------------|----------------------|----------------------|-----------------------|-------------|--------------|---------------|---------------|---------------|---------------|----------|----------------|-----------------|-----------------|-----------------|-----------------|-------------|------------------|-------|---------------------------|----------------------------------|-------|
| 0 | 2023 ALBANY PARK | 1269 | 1916 | 1801 | 2306 | 3379 | 4799 | 2955 | 4513 | 5442 | 4354 | 2287 | 4913 | 2405 | 4116 | 5228 | 3764 | 3054 | 47830 | 21496 | 2228 | 759 | 7124 |
| 1 | 2023 ARCHER HEIGHTS | 223 | 752 | 441 | 795 | 739 | 1927 | 732 | 1102 | 1240 | 1417 | 1035 | 1502 | 899 | 978 | 1167 | 854 | 1021 | 13875 | 6232 | 10 | 108 | 679 |
| 2 | 2023 ARMOUR SQUARE | 701 | 798 | 370 | 637 | 597 | 1300 | 487 | 871 | 1174 | 1177 | 1032 | 1022 | 517 | 965 | 1163 | 1378 | 2063 | 13149 | 2556 | 1487 | 107 | 8402 |
| 3 | 2023 ASHBURN | 797 | 1351 | 1985 | 3014 | 2735 | 5150 | 1964 | 2881 | 4178 | 4228 | 2473 | 5138 | 2248 | 2774 | 4582 | 4044 | 3184 | 42842 | 11297 | 18124 | 697 | 436 |
| 4 | 2023 AUBURN GRESHAM | 2541 | 2451 | 1592 | 2202 | 1850 | 5803 | 1836 | 2964 | 3431 | 3469 | 3223 | 5305 | 2304 | 3057 | 4522 | 5213 | 5357 | 46483 | 760 | 43414 | 119 | 399 |

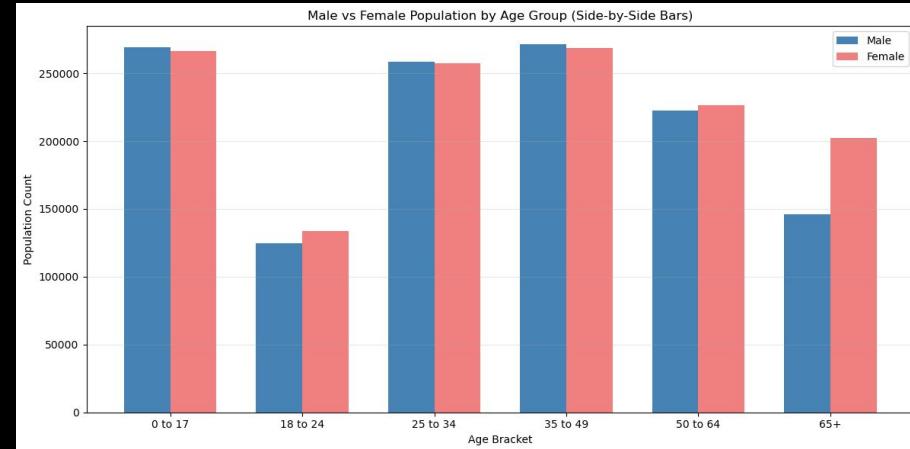


Income Distribution

Households earning more than \$125k is the largest population compared to the others.

Smallest income bracket is households making less than \$25k

Of note this dataset does not include information on family structure, dual income/married households or single parents.



Gender Distribution

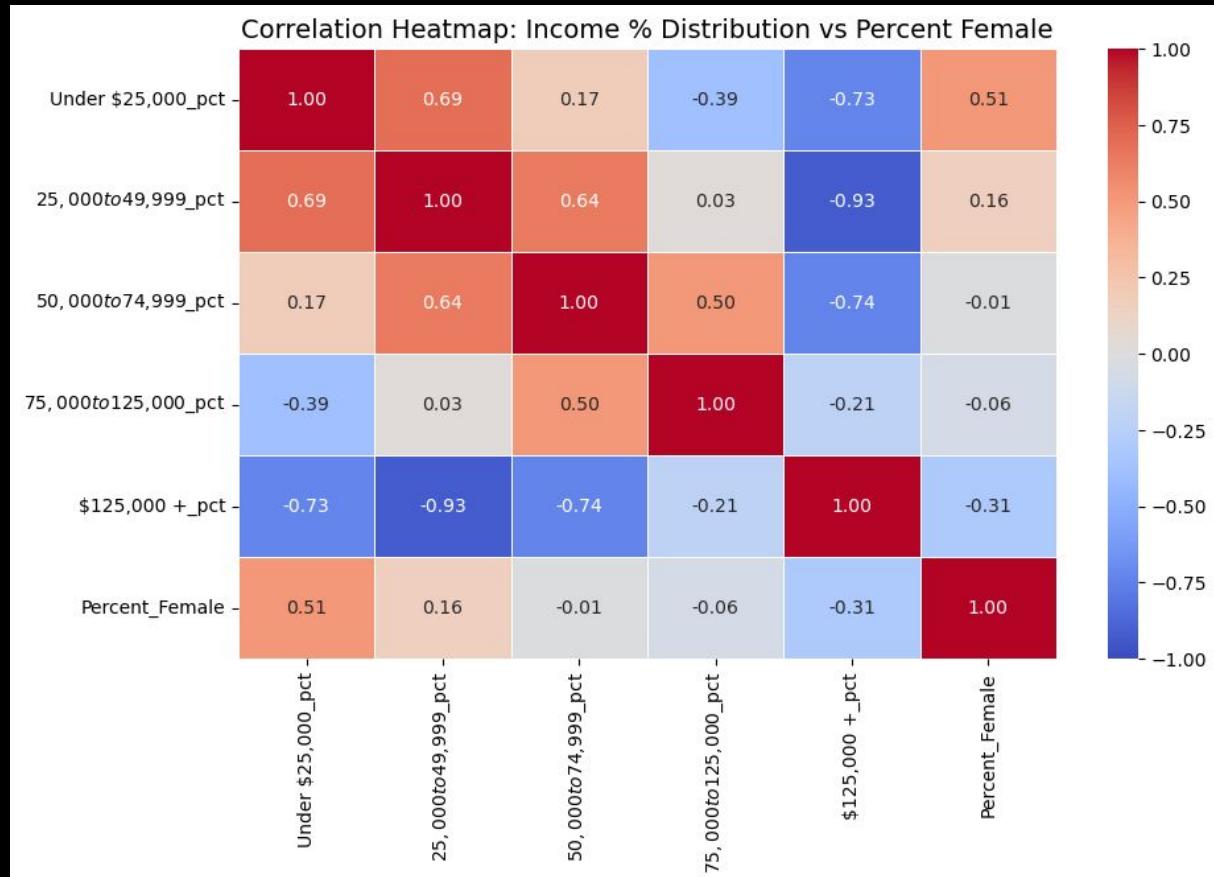
Distribution of males and females by age bracket

All age brackets seem to be near 50% distribution of genders which makes logical sense

More women than men at 65+ again makes sense since women tend to live longer than men

Correlation

- Positive correlation between Percentage Female and percentage of households under \$25k
- Negative correlation with % of households above \$125k
- Middle income brackets show weak or no relationships



Regression

Run a linear regression for each income bracket compared to Female Percentage of Population

$H_0: \beta_1 = 0$ (No association between Percent Female and income)

$H_A: \beta_1 \neq 0$ (Income share depends on Percent Female)

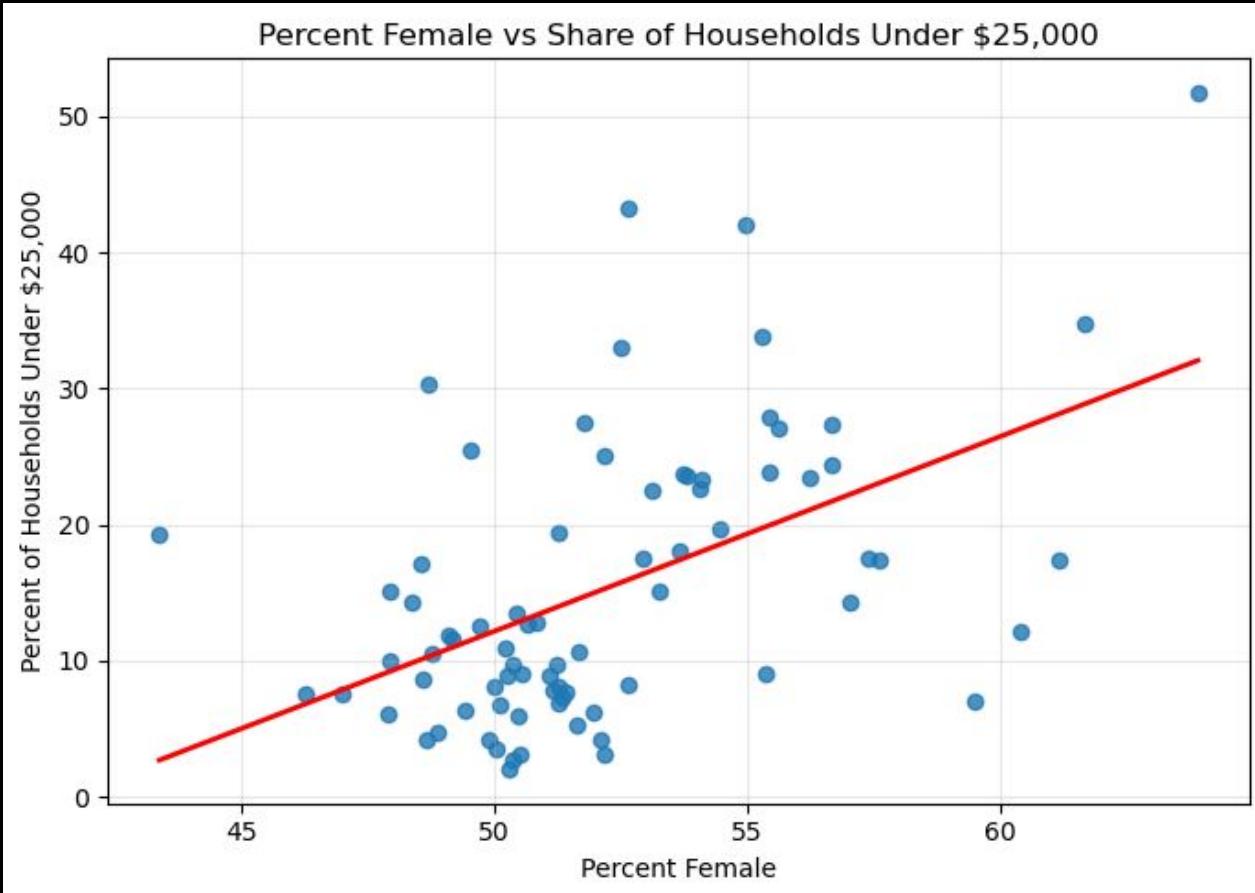
Low Income Households

Income < \$25,000

- Slope: +1.432
- p-value: < 0.001
- R²: 0.255

We Reject the null hypothesis, there is strong evidence that neighborhoods with more women have higher proportions of low-income households.

Although we are only accounting for ~25% of the variability with the % of female population.



Other Income Brackets

Income \$25,000 - \$125k

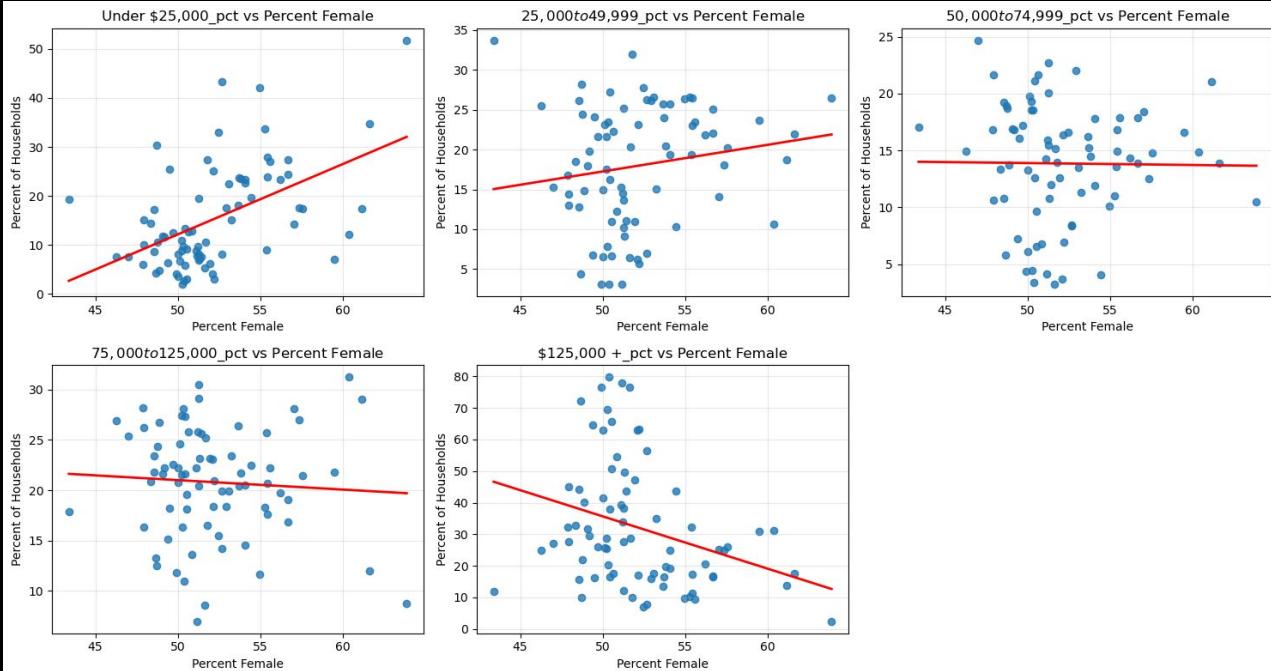
- p-values: 0.16, 0.92, 0.58

For all the middle income brackets we Fail to Reject the null hypothesis, there is not enough evidence to prove a relationship between female population and income

Income +\$125,000

- p-value: 0.0006
- Slope: -1.655
- $R^2 = 0.095$

We reject the null hypothesis: There is strong evidence for a negative relationship between income and female population. Although we are only accounting for less than 10% of the variability in income.



Conclusions

What did we learn?

A neighborhood's gender composition is associated with income distribution.

Neighborhoods that skew towards higher female populations have:

- Higher shares of low-income households
- Lower shares of high-income households
- No meaningful relationship observed in the middle-income brackets.

Implication:

While there is a relationship between gender composition and income inequality, there needs to be more information regarding household/family makeup to make more in depth observations.

THANK YOU

Any questions?