# Relationship Between Municipal Redlining and Smoking in Rochester, New York

**Quinn L. Olson, Jessica R. Rosman, Ryan T. Mulhern, Holly Widanka, Deborah J. Ossip, Scott McIntosh**

**Department of Public Health Sciences, University of Rochester Medical Center, Rochester, NY, USA**

## Background

- Redlining: Discriminatory mortgage / housing practices in the 1930s, used to grade city areas on "desirability."
- Desirability was determined based on the race of the residents and used to make color-coded maps.
- These maps were used to systematically prevent immigrants and people of color from moving into white neighborhoods, devalue the property they owned, and enforce segregation.
- Redlining was formally banned in 1968 via the Fair Housing Act but continues to have a strong legacy today.
- Formerly redlined regions of cities have poorer health outcomes like shorter average life spans and higher rates of cardiovascular diseases, diabetes, and asthma.
- Previous studies suggest redlined areas may have higher concentrations of alcohol and tobacco retailers.
- This study investigated how redlining may have impacted modern tobacco use in Rochester, New York (population 211,000 in 2020) by comparing historical redlined maps to current prevalence rates.

## Methods

- Tobacco and health data were gathered at state, county, zip code, and census tract level from **Common Ground Health** (local nonprofit data repository) and the **University of Rochester Medical Center**.
- *OpenStreetMap* and *Clip Studio Paint* were used to map data (*Figures 1-4*).
- Results were extrapolated from the comparisons of the healthcare maps to the redlined map of the city.

## Results

- Historical red zones (4 of 5) are entirely within zip codes with over 120 tobacco vendors and 8 of 19 of the yellow zones had at least 10% overlap (*Fig. 2*).
- In contrast, only 1 of 14 blue and 1 of 11 green zones overlapped with same high-density regions (*Fig. 2*).
- Zip codes with 31 to 60 tobacco retailers were concentrated in green zones (10) and moderate overlap with yellow (8) and blue (6) zones (*Fig. 2*).
- Highest density of smoking adults per census tract (32.1-36.2%), was spread across 3 red and 3 adjacent yellow zones (*Fig. 4*).
- Tracts with higher rates (24.5-28.7%, 28.8-32.0%) overlapped with primarily yellow (10, 4) zones with red (2, 3) & blue (1, 0) zones to lesser extent (*Fig. 4*).
- Green zones (2) not excluded in census tract data, plus 5 blue and 6 yellow zones, were concentrated in low percentage-smoker tracts (10.9-19.5%) (*Fig. 4*).

## Discussion

The highest density of both tobacco retailers and smoking populations were found predominantly in red zones and the adjacent yellow zones (*Fig. 3*). A clear pattern was seen of increased smoking rates in redlined regions of the city, suggesting a correlation between redlining and tobacco use.

*Proactive studies should investigate causal relationships between past segregation and smoking prevalence.*

Figure 1. Redlined Map of Rochester, NY (1938)

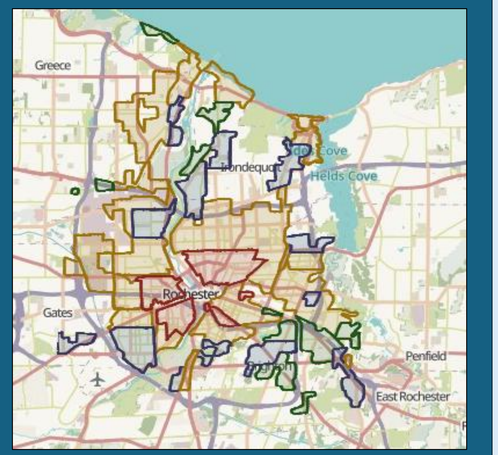



Figure 2. Overlap of Redlining and Smoking Populations (2015)

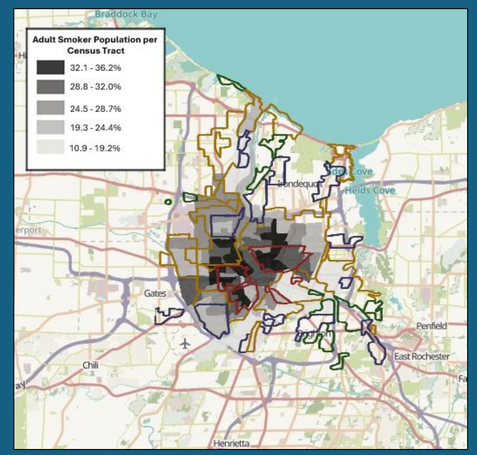



Figure 3. Overlap of Smoking and Retailer Density (1938, 2015, 2018)

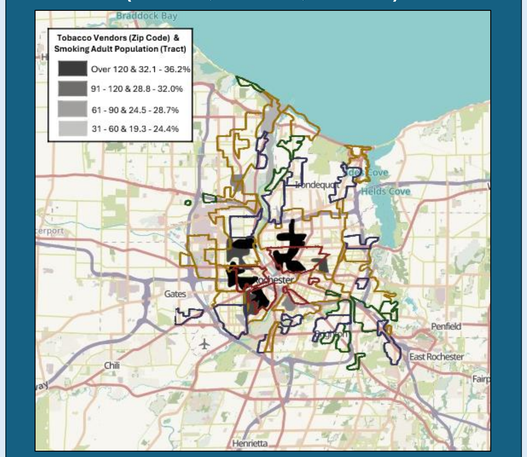
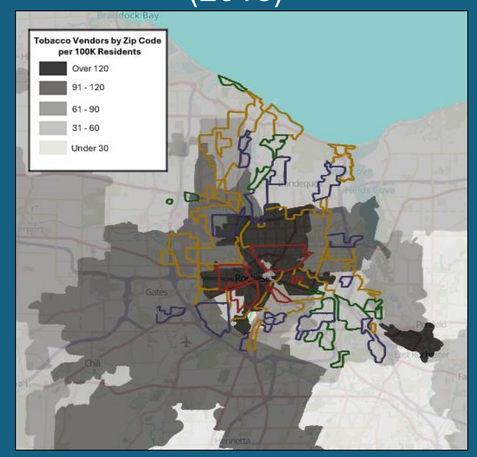



Figure 4. Overlap of Redlining and Tobacco Retailer Density (2018)




***Supported by NY State DOH Contract #DOH01-C35536GG-3450000. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NYS DOH.***