



# **Exploring the Intersection of Zip Code, Racial Demographics, and Auto Insurance Rates**

**A Comprehensive Review of  
Research and Challenges in Pursuit of Equity**

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# Introduction

- Auto Insurance rates vary significantly across different geographic areas, with zip codes playing a crucial role in determining premiums. Additionally, racial demographics within these zip codes have been shown to correlate with disparities in auto insurance pricing. This research aims to provide a comprehensive overview of existing research on the relationship between zip codes, racial demographics, and auto insurance rates.

# Problem Statement and Research Questions

## Problem Statement:

The disparity in auto insurance rates based on zip codes, particularly in minority urban neighborhoods, raises concerns about equity and fairness. Despite regulatory oversight, research reveals higher premiums for drivers in these areas compared to predominantly Caucasian neighborhoods. Factors like population density, crime rates, loss ratio, traffic congestion and credit scores influence these disparities. However, gaps remain in understanding these dynamics and evaluating policy effectiveness.

## Research Questions:

- How does the percentage of minority population in large cities correlate with auto insurance rates by zip code, after controlling for population density, crime rates, loss ratio, traffic congestion, and credit score?
- To what extent do demographic factors, such as minority population percentages, contribute to variations in auto insurance rates compared to other variables like population density, crime rates, traffic congestion, loss ratio, and credit score?

# Background/Literature Review

- Studies conducted by research institutions, investigative journalists, and consumer reports consistently demonstrate substantial variations in auto insurance premiums across different zip codes, with some areas experiencing disproportionately high rates compared to others.
- Recent research conducted by the insurance industry has expanded the scope to examine the interplay between zip codes, racial demographics, and auto insurance rates, utilizing advanced statistical methods to analyze individual and zip code-level factors.
- The National Conference of Insurance Legislators (NCOIL) has developed Model Laws to regulate auto insurance scoring methodologies, addressing concerns of unfair discrimination and advocating for state jurisdiction over insurance regulation.
- Investigative journalism has revealed stark disparities in premiums based on credit scores and zip codes, with drivers in predominantly minority neighborhoods facing higher costs, highlighting the inequities within the insurance market.
- The use of socioeconomic factors in insurance pricing has spurred regulatory initiatives to outlaw discriminatory practices and impose temporary bans on rate increases based on credit scores in certain states.
- The National Association of Insurance Commissioners (NAIC) Database Auto Insurance Report provides comprehensive statistical data on various cost factors in each state, offering valuable insights for regulators and policymakers in understanding the costs associated with personal automobile insurance.

# Objectives of the Study

- Explore the impact of zip codes on variations in auto insurance rates.
- Investigate how racial demographics within zip codes contribute to disparities in auto insurance pricing.
- Examine the influential factors in auto insurance rating, including population density, crime rates, loss ratio, traffic congestion, and credit scores, to understand their role in contributing to disparities in auto insurance rates based on zip codes, particularly in minority urban neighborhoods.
- Provide an overview of existing research on the relationship between zip codes, racial demographics, and auto insurance rates.

# Proposed Methods

**(data sources/measurement/design/procedure)**

- Secondary data sources include government agencies, research institutions, insurance industry reports, and investigative journalism conducted by popular sources.
- Utilize zip codes within large cities in the United States as the unit of analysis, with each zip code serving as a distinct unit for examining disparities in auto insurance rates.
- Select a sample of large cities in the United States based on criteria including population size, geographical diversity, and representation of minority populations to ensure a diverse and representative sample for analysis.
- Variables of interest encompass demographic factors, crime rates, traffic congestion, loss ratio, credit score, and auto insurance rates.
- Correlation analysis identifies relationships between variables, elucidating potential associations between factors such as zip codes, racial demographics, and insurance premiums.
- Quantitative data analysis provides a robust framework for uncovering patterns and trends within large datasets, informing evidence-based conclusions regarding the factors influencing auto insurance disparities.

# Proposed Methods (continued)

• Data on auto insurance rates, population demographics, crime rates, population density, traffic congestion levels, loss ratio, and credit score will be collected from reputable sources such as:

- U.S. Census
- Federal Bureau of Investigation (FBI)
- U.S. Department of Transportation (USDOT)
- U.S. Department of Treasury (USDT)
- National Conference of State Legislators (NCSL)
- National Center for Education Statistics (NCES)
- ProPublica (independent non-profit investigative journalism)
- Consumer Reports
- Credit bureaus
- Insurance industry reports

• Data Analysis:

- Statistical analysis techniques, including correlation analysis and multiple regression analysis, will be employed to examine relationships between variables and assess the significance of correlations.
- Descriptive statistics such as means, standard deviations, and frequency distributions will be used to summarize key variables.
- Graphical representations such as scatter plots and/or bar charts will be utilized for data visualization and presentation.

# Expected Findings

- Significant correlations between the percentage of minority population in large cities and auto insurance rates by zip code, after controlling for other factors such as population density, crime rates, traffic congestion levels, loss ratio, and credit score.
- Recognition of potential systemic biases or discriminatory practices within the insurance industry that may contribute to disparities in auto insurance pricing.

# References

*Crime-rate*. Oxford Reference. (n.d.). <https://www.oxfordreference.com/display/10.1093/oi/authority.20110803095647845>

*Definitions (diversity, equity, and inclusion)*. Diversity, Equity, and Inclusion (Penn State College of Agricultural Sciences). (n.d.). <https://agsci.psu.edu/diversity/awareness/definitions>

*Guide to loss ratio*. Relativity6. (n.d.).

<https://www.relativity6.com/article/guide-to-loss-ratio-insurance#strongdefinition-of-loss-ratiostrong>

Legal Information Institute. (n.d.). *Credit score*. Legal Information Institute. [https://www.law.cornell.edu/wex/credit\\_score](https://www.law.cornell.edu/wex/credit_score)

Longero, L. (n.d.). *How your ZIP code affects your car insurance*. Carinsurance.com. <https://www.carinsurance.com/Articles/zip-code-car-insurance.aspx>

*Population density*. Education. (n.d.).<https://education.nationalgeographic.org/resource/population-density/>

*Traffic congestion and reliability: Trends and advanced strategies for congestion mitigation*. Traffic Congestion and Reliability: Trends and Advanced Strategies for Congestion Mitigation: Chapter 2. (n.d.). [https://ops.fhwa.dot.gov/congestion\\_report/chapter2.htm](https://ops.fhwa.dot.gov/congestion_report/chapter2.htm)

Harleston, J. (n.d.). *Automobile Insurance Rating Differential between Urban and Suburban Territories*. Automobile insurance rating differential between urban and suburban <https://www.cga.ct.gov/PS98/rpt%5Colr%5Chtm/98-R-0986.htm>

*Propublica and consumer reports: Auto insurers charging higher rates in some minority neighborhoods*. Product Reviews and Ratings –

Consumer Reports. (n.d.). [https://www.consumerreports.org/media-room/press-releases/2017/04/propublica\\_and\\_consumer\\_reports\\_auto\\_insurers\\_charging\\_higher\\_rates\\_in\\_some\\_minority\\_neighborhoods11/](https://www.consumerreports.org/media-room/press-releases/2017/04/propublica_and_consumer_reports_auto_insurers_charging_higher_rates_in_some_minority_neighborhoods11/)

The Providence Journal. (n.d.). *News in Providence, RI*. The Providence Journal. [https://www.providencejournal.com/news/Racial\\_and\\_ethnic\\_minorities\\_made\\_up\\_about\\_22\\_percent\\_of\\_the\\_rural\\_population\\_in\\_2018,\\_compared\\_to\\_43\\_percent\\_in\\_urban\\_areas](https://www.providencejournal.com/news/Racial_and_ethnic_minorities_made_up_about_22_percent_of_the_rural_population_in_2018,_compared_to_43_percent_in_urban_areas). USDA ERS –

Chart Detail. (n.d.). <https://www.ers.usda.gov/data-products/chart-gallery/gallery/chart-detail/?chartId=99538#:~:text=Racial%20and%20ethnic%20minorities%20made,than%20the%20Nation's%20urban%20areas>

2019/2020 Auto Insurance Database Report. (n.d.). <https://content.naic.org/sites/default/files/publication-aut-pb-auto-insurance-database.pdf>

Waddell, kaveh. (2023, April 16). *How credit scores and ZIP codes can make car insurance much more* <https://www.consumerreports.org/money/car-insurance/credit-scores-zip-codes-makecarinsurance-pricier-in-ny-a8532785979/>