



Interactions of Health Care Rating Factors with Race/Ethnicity and Socioeconomic Status

Lydia Tolman, FSA, MAAA; Jackie Young, ASA, MAAA



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Introductions



Lydia Tolman, FSA, MAAA

Senior Consulting Actuary, Wakely Consulting Group, an HMA Company

Lydia has experience with many facets of actuarial work, including pricing, reserving, forecasting, risk adjustment, and preparing annual statements. Her focus is primarily on commercial products, including individual Accountable Care Act, grandfathered, and transitional products, as well as group products. She has Medicare experience with a focus on Medicare supplement and Part D. Ms. Tolman has been a manager overseeing individual ratings and a senior manager overseeing financial planning, reserving, and analysis.



Jackie Young, ASA, MAAA

Consulting Actuary, Wakely Consulting Group, an HMA Company

Since joining Wakely in 2016, Jackie has primarily focused on the pricing of Commercial products, including individual ACA, small group ACA, and large group products, as well as Medicare Advantage bids. She has also conducted work in reserving, risk adjustment, self-funded projections, and other data driven healthcare analyses.



Presentation Agenda







Background and Research Scope



Diversity, Equit and Inclusion

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Background

- Premiums are the amount a group or an individual pay to an insurer every month to fund health care expenses and gain access to the insurer's network of physicians, hospitals, pharmacies, and so on.
- Premiums are made up of several components, including
 - Claims (>80% of premiums for individuals/small groups and >85% of premiums for large groups)
 - Administrative Expenses (e.g. expenses to pay claims),
 - Taxes and fees
 - Net risk margin or profit.



Background

- Affordable Care Act (ACA) Plan Premium Development
 - Age: Healthcare costs tend to increase as we age.
 - Geographic Area: Differences between locations:
 - Cost differences between health care providers
 - Cost of living
 - Variation in utilization of medical services
 - Tobacco use: Tobacco users tend to be more expensive
 - Individual vs. family enrollment: Costs are greater when multiple people are covered.
 - **Plan category**: Expect claims costs are greater when the insured pays lower cost share.
- Large Group Premium Development & Industry Factors



Scope of Project

Our research focused on whether **tobacco**, **geographic**, and **industry factors** might lead to higher rates charged for specific subsets of **race/ethnicity or socioeconomic status** within the individual, small group, and large group markets.

<u>This research did not examine underlying claims costs.</u> We did not speculate on whether or not rating factors are indicative of actual costs.



Limitations & Disclosures

Limitations

- Geographic Limitations focused on Florida because of rating area granularity
- Network Variances & General Cost of Care impact on geography
- Focus on premiums only, not claim costs

Disclosures

- This research did not consider whether or not the rating factors examined (tobacco, area, and industry) accurately reflect the underlying claims expenses used to develop those factors.
- The researchers did not have access to the underlying claims costs (actual or projected) and cannot conjecture whether or not rating factors are indicative of actual costs.
- The intent of this research is to advocate neither for nor against the inclusion of tobacco, area, or industry rating factors in health insurance. Nor do we



advocate for or against proposing the inclusion of alternative rating factors.



Data and Methodology



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Data Sources

- Publicly available data sets were used to segment the population into common rating factors (tobacco, geographic, industry) along with other demographic data, e.g., race/ethnicity and socioeconomic status.
- The American Community Survey Data (ACS)
- 2021 County Health Rankings Data (CHR)
- 2021 rating manuals available through state filing websites:
 - Florida 2021 ACA Individual and Small Group filings for several carriers
 - Colorado 2021 Large Group filings for several carriers



Data Visualization

• Hierarchical Clustering: Identify and group counties with similar characteristics

Bubble Plot

- Visualize the relationship between demographic and rating variables.
- Bubble sizes correspond to the population of the rating area.
- In some cases, colors of bubbles indicate different groups of counties, where hierarchical clustering is used for grouping.







Correlation Analysis

Pearson Correlation

- Measures the linear correlation between two variables.
- A positive correlation coefficient corresponds to an increasing linear relationship.

Spearman Correlation

- A nonparametric measure of the rank correlation between two variables.
- Works well with monotonic relationships without assuming knowledge of the variables' distribution
- A positive correlation coefficient indicates an increasing monotonic relationship.
- Weighted Linear Regression: A population-weighted simple linear regression can be also applied to explore the correlation between rating variable and demographic variable.





Research Results Tobacco Surcharge



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Tobacco Surcharge

- Prior to the implementation of the ACA, health insurers increased rates or declined coverage for individuals for several factors that could be linked to a person's lifestyle, e.g. smoking, alcohol or other drug abuse, or obesity.
- Post ACA implementation, pre-existing health conditions are no longer allowable rating factors with the exception of tobacco use.
 Smokers can still be charged up to 50% more than non-smokers under the ACA.





Tobacco Surcharge – Household Income

Interpretation:

- X-axis: Median household income
- Y-axis: Proportion of adult smokers
- Blue Bubbles: Individual Florida counties
- Size of the Bubble corresponds to the population size of the county
- Yellow Line: Simple linear regression trend



Tobacco Surcharge – Household Income

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Takeaways:

- Counties with higher proportions of adult smoking are correlated with lower household income levels.
- Tobacco loads clearly affect lower income populations more than higher income populations.

Tobacco Surcharge – Hierarchal Clustering

MEDIAN HOUSEHOLD INCOME CLUSTERS IN FLORIDA



Interpretation: Counties are clustered based on median household income.

Takeaways: These clusters are used in the following bubble charts.



Tobacco Surcharge – Hispanics/Latinos

PREVALENCE OF ADULT SMOKING AND PROPORTION OF HISPANICS/LATINOS IN FLORIDA



Interpretation:

- X-axis: Proportion of Hispanic/Latino
- Y-axis: Median household income
- Bubbles: Individual Florida counties
- Size of the Bubble corresponds to the population size of the county
- **Color of the Bubble** corresponds to the median household income.

Tobacco Surcharge – Hispanics/Latinos

PREVALENCE OF ADULT SMOKING AND PROPORTION OF HISPANICS/LATINOS IN FLORIDA



SOA Research

Interpretation:

- X-axis: Proportion of Hispanic/Latino
- Y-axis: Median household income
- Bubbles: Individual Florida counties
- Size of the Bubble corresponds to the population size of the county
- **Color of the Bubble** corresponds to the median household income.

Takeaways:

- Hispanic/Latino adults are **less likely to smoke** than other races/ethnicities.
- Negative correlation between proportion of adult smoking and proportion of Hispanic/Latino
- Hispanic/Latino populations may be less likely to experience smoking loads than other races/ethnicities.
- Counties with the lowest median household income counties have the highest proportion of adult smoking and are therefore more likely to be charged a smoking load.

Tobacco Surcharge – Non-

Hispanic/Latino Whites

PREVALENCE IN ADULT SMOKING AND PROPORTION OF NON-HISPANIC/LATINO WHITES IN FLORIDA





Interpretation:

- X-axis: Proportion of Non-Hispanic/Latino whites
- Y-axis: Proportion of Adult Smoking
- Bubbles: Individual Florida counties
- Size of the Bubble corresponds to the population size of the county
- **Color of the Bubble** corresponds to the median household income.

Takeaways:

- Weak correlation between proportion of adult smoking and proportion of Non-Hispanic/Latino whites
- It would be tempting to conclude that lower income whites may be more affected by the tobacco load surcharge than other racial groups.
 The results are not statistically significant.
- Regardless of the proportion of white population, the lowest median household income counties have the highest proportion of adult smoking and are therefore more likely to be charged a smoking load.

Tobacco Surcharge – Correlation Coefficients

CORRELATION OF PERCENTAGE OF ADULT SMOKING AND PERCENTAGE OF EACH RACE/ETHNICITY

Race/Ethnicity	Pearson Correlation, r	Spearman Correlation, rho
Hispanic/Latino	-0.408	-0.513
Asian American	-0.730	-0.827
Non-Hispanic/Latino Black/African American	0.116	0.160
Non-Hispanic/Latino White	0.330	0.274



Tobacco Surcharge – High School Completion

PREVALENCE OF ADULT SMOKING AND PROPORTION OF HIGH SCHOOL COMPLETION IN FLORIDA





Interpretation:

- X-axis: High School Completion Proportion
- Y-axis: Proportion of Adult Smoking
- Bubbles: Individual Florida counties
- Size of the Bubble corresponds to the population size of the county
- **Color of the Bubble** corresponds to the median household income.

Takeaways:

- Strong positive correlation between median household income and other fields typically associated with higher incomes, e.g. High School Completion, Some College, and Food Environment Index.
- Those with less formal education (and with lower incomes and with less access to high quality foods) are more likely to be charged a tobacco surcharge.

Tobacco Surcharge – Food Environment Index and Some College Education

PREVALENCE OF ADULT SMOKING AND FOOD ENVIRONMENT INDEX



PREVALENCE OF ADULT SMOKING AND PROPORTION OF SOME COLLEGE EDUCATION IN FLORIDA





Tobacco Surcharge – Example of Impact

64-YEAR-OLD MAKING \$20,000 PER YEAR

Scenario 1	Non-Smoker	Smoker
Age	64	64
Income	\$20,000	\$20,000
Monthly Non-Smoker Premium Rate	\$1,049	\$1,049
Smoking Load	0%	20%
Monthly Premium Rate (without Subsidy)	\$1,049	\$1,259
Monthly Subsidy	<u>(\$1,049)</u>	<u>(\$1,049)</u>
Monthly Premium Net Subsidy (Cost to Member)	\$0	\$210
Annual Premium Cost to Member	\$0	\$2,517
Annual Additional Premium for Smoking (\$)		\$2,517



Tobacco Surcharge – Conclusions

- In some cases, smokers pay a premium while their non-smoking counterparts pay nothing out-of-pocket. In other cases, the same plan can be over 200% more expensive once a tobacco surcharge is added.
- Current tobacco surcharges may be capturing unintended factors, such as socioeconomic status or other comorbid conditions
- Tobacco usage is clearly linked with increased health care costs. Regardless, tobacco load could be impacting racial/ethnic and socioeconomic groups disparately.





Research Results Area Factors



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Area Factors

- One of the other allowable rating factors under the ACA is based on the member or group's place of residence, or **rating area**.
- The geographic rating factor is implemented to capture differences in health care costs and utilization differences between areas. This can vary between individual and small group markets.
- The state of Florida ACA market has sixty-seven different rating areas one for each county in the state. Each can potentially be assigned a unique rating factor, depending on the geographic differences as justified by the carrier.



Area Factors – Hispanics/Latinos

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Proportion of Hispanic/Latino

75

100



0

Interpretation:

- X-axis: Proportion of Hispanic/Latino
- **Y-axis**: Normalized Area Factor A higher area factor represents a higher average premium (all else equal)
- Blue Bubbles: Individual Florida counties
- Size of the Bubble corresponds to the population size of the county
- Yellow Line: Simple linear regression trend

Takeaways:

- Positive correlation between county's proportion of Hispanic/Latino population and area factor
- Hispanics/Latinos in the Florida ACA individual market are more likely to have a greater-than-average area factor, which may lead to higher premiums.

Area Factors – Non-Hispanic/Latino Whites



Interpretation:

- X-axis: Proportion of Non-Hispanic/Latino whites
- Y-axis: Normalized Area Factor A higher area factor represents a higher average premium (all else equal)
- Blue Bubbles: Individual Florida counties
- Size of the Bubble corresponds to the population size of the county
- Yellow Line: Simple linear regression trend

Takeaways:

- Negative correlation between county's proportion of non-Hispanic/Latino white population and area factor
- Non-Hispanics/Latino whites in the Florida ACA individual market are more likely to have a lower-than-average area factor, which may lead to lower premiums.



Area Factors – Correlation Coefficients (Individual)

CORRELATION OF AREA FACTORS AND PERCENTAGE OF EACH RACE/ETHNICITY

Race/Ethnicity	Pearson Correlation, r	Spearman Correlation, rho
Hispanic/Latino	0.296	0.224
Asian American	-0.126	-0.113
Non-Hispanic/Latino Black/African American	-0.052	-0.050
Non-Hispanic/Latino White	-0.205	-0.195



Area Factors – Small Group ACA



Spearman Correlation: -0.226



Area Factors – Conclusions

- Regardless of whether or not area factors are indicative of cost, area factors could be impacting racial/ethnic groups disparately.
- Our analysis concludes that area factors are correlated with the Hispanic/Latino and Non-Hispanic/Latino white populations in Florida. Based on the distribution of the current Florida residents, the Hispanic/Latino population is more likely to see a higher area factor, where the Non-Hispanic/Latino White population is more likely to see a lower area factor.
- After studying the same relationships for Non-Hispanic/Latino Black/African American and Asian/American populations in Florida, we did not observe the same correlation.





Industry Factors



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Industry Factors

- Standard Industrial Classification (SIC) codes
 - Less used by governmental agencies, like the U.S. Census Bureau
 - Publicly available data (the American Community Survey) did not include SIC code and rather used the North American Industry Classification System (NAICS) codes.
- The results available to the researchers were rolled up at a fairly high level because of crosswalking between the two systems.
- Large group health insurers do not have to publicly disclose industry factors for most states.
 - Colorado appears to be an exception to this rule
 - Industry factors are not typically varied by state, so the researchers felt using Colorado data was an appropriate simplification.



Industry Factors

Interpretation:

- X-axis: Proportion of people identifying with a certain racial/ethnic group.
- **Y-axis:** Broad industry category

Takeaways:

- It is difficult to draw any conclusions about industry factor and race/ethnicity.
- This does not mean that disparate impacts are not occurring. Rather, because industry factor loads are not standardized and are not transparent, the factors studied were aggregated to such a level that detailed statistical analyses could not be performed.



- White alone
- Black or African American alone
- American Indian alone
- Alaska Native alone
- American Indian and Alaska Native tribes specified; or American Indian or Alaska Native, not specified and no other races
- Asian alone
- Native Hawaiian and Other Pacific Islander alone
- Some Other Race alone
- Two or More Races





Potential Future Research



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Potential Future Research

- Expansion of Geographic Area Analysis
- Detailed Carrier-Specific Study
- Compare Claims Costs to Rating Factors







Appendix



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