

Geographic Analysis of Nursing Home Deaths

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BACKGROUND

Neglect in nursing homes is an overlooked and underreported issue. It leads to unnecessary harm and suffering in a vulnerable population. There are many. Additionally, the proportion of people living in nursing homes is projected to triple by 2050.¹

As the number of people living in nursing homes increases, the rate of neglect will continue to rise along with it. This will be exacerbated by resources which will be divided even more.

AIM and GOAL

This analysis aims to use geospatial modeling to identify the clusters of elder neglect within nursing homes. Patterns and clusters can be used to identify areas where abuse may be more prevalent.

Nursing home deaths were used as a proxy for neglect given how abuse cases are underreported.

Identify and understand geographic patterns of elder neglect, then use these patterns to highlight opportunities and challenges in preventing neglect.

METHODS

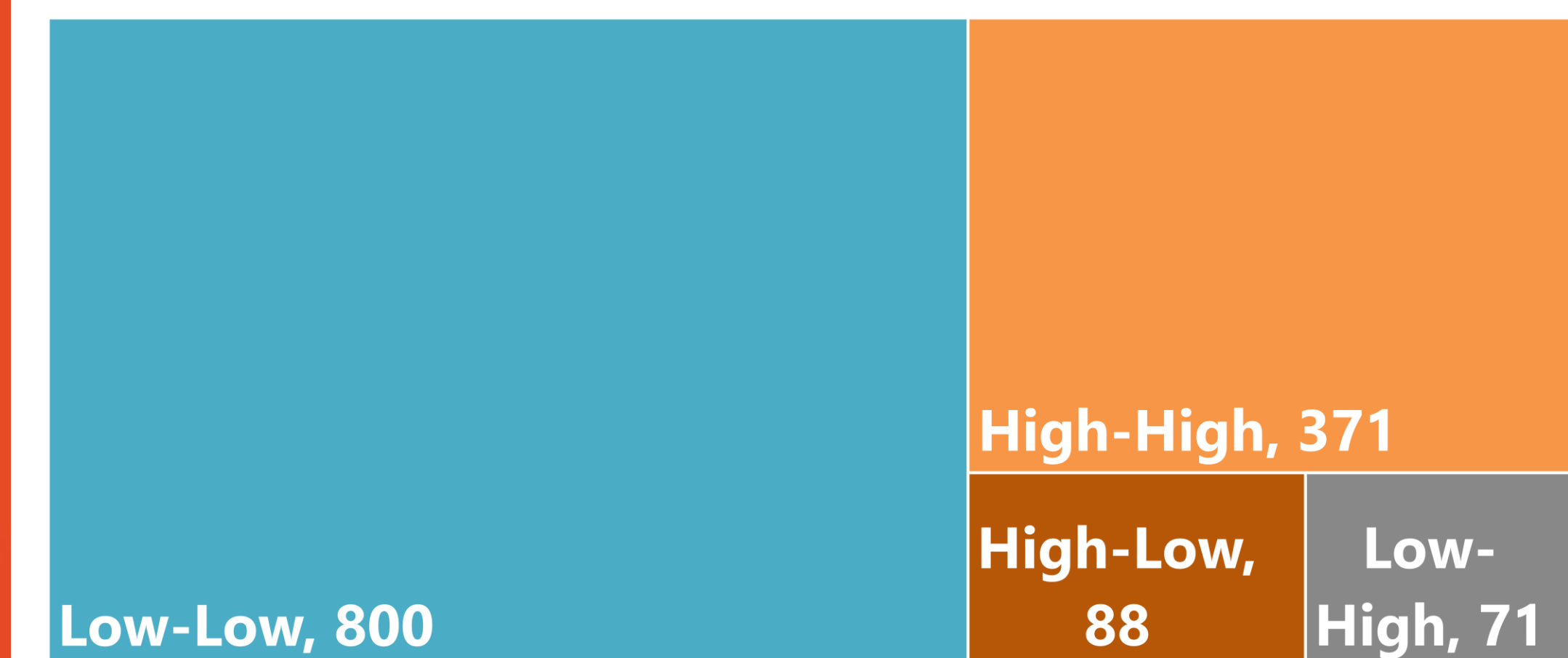
Medicare data was used to assess the geographic distribution of accidental nursing home deaths on a county level. Data used reflects the years 2012 to 2019.

Analysis was done in Python. GeoDa² was used for geospatial analysis. Moran's I statistic was used to classify areas relative to their neighbors based on deaths into High-High, High-Low, Low-High, and Low-Low categories. Factorial ANOVA was used to identify demographic variables that differed between clusters.

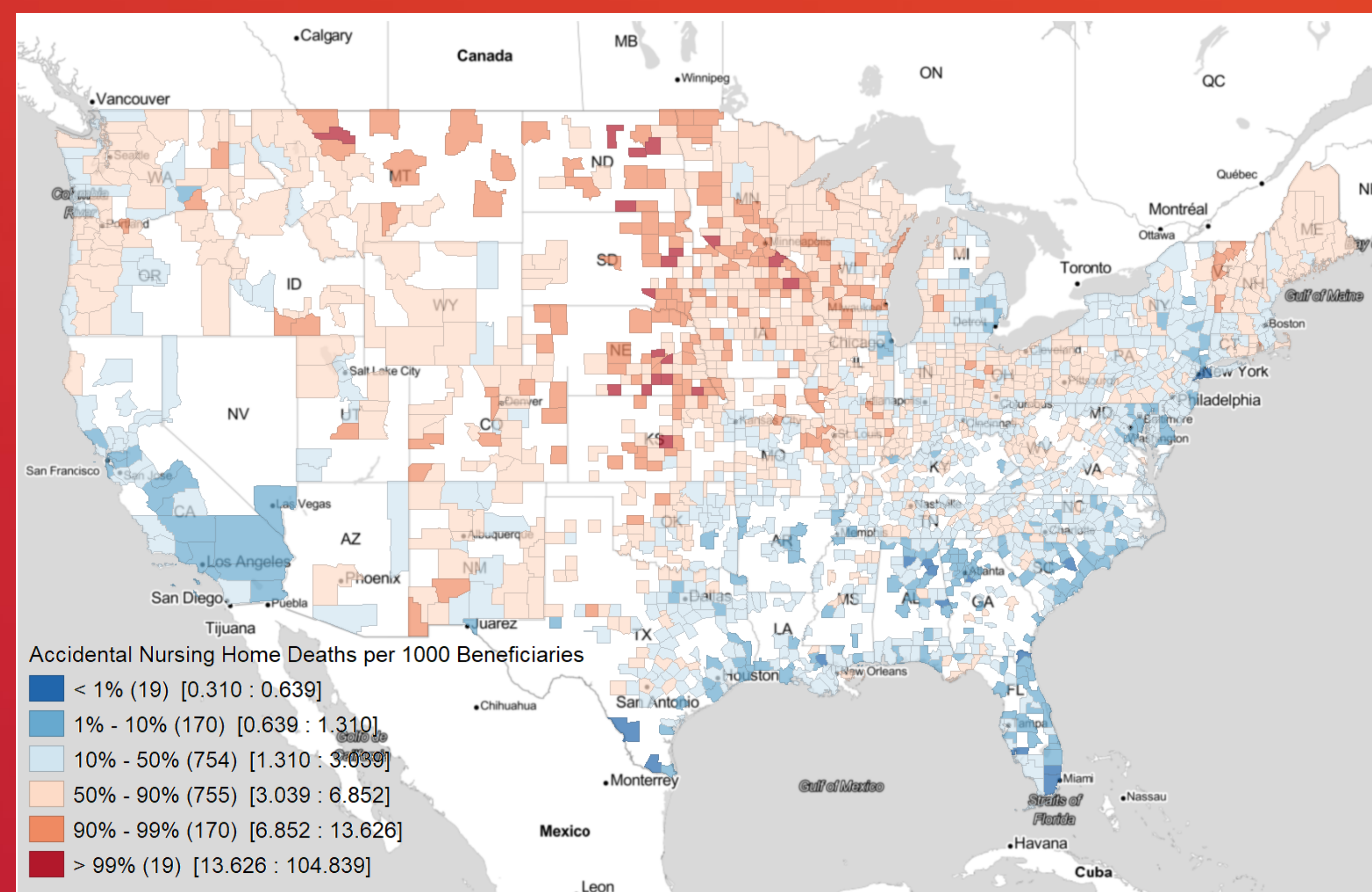
RESULTS

Visualization of the geographic clusters identified clear differences between High-High and Low-Low clusters. High-High clusters tended to encompass the upper Midwest, including Minnesota, Wisconsin, and Iowa. Low-Low clusters tended to predominate in the Southern states and the West Coast ($p < 0.05$). Factorial ANOVA was performed at a Bonferroni-adjusted significance threshold of 0.001. High-High clusters tended to have a lower percentage of poverty (11.5%) compared with Low-Low clusters (15.7%). They also tended to have a larger white population (91.6%) than Low-Low clusters (82.2%). They typically had a lower Rural-Urban continuum code (5.3) than Low-Low clusters (3.2), signifying they were more rural with lower population density. Median household income was not a significant differentiator.

[Clusters](#)

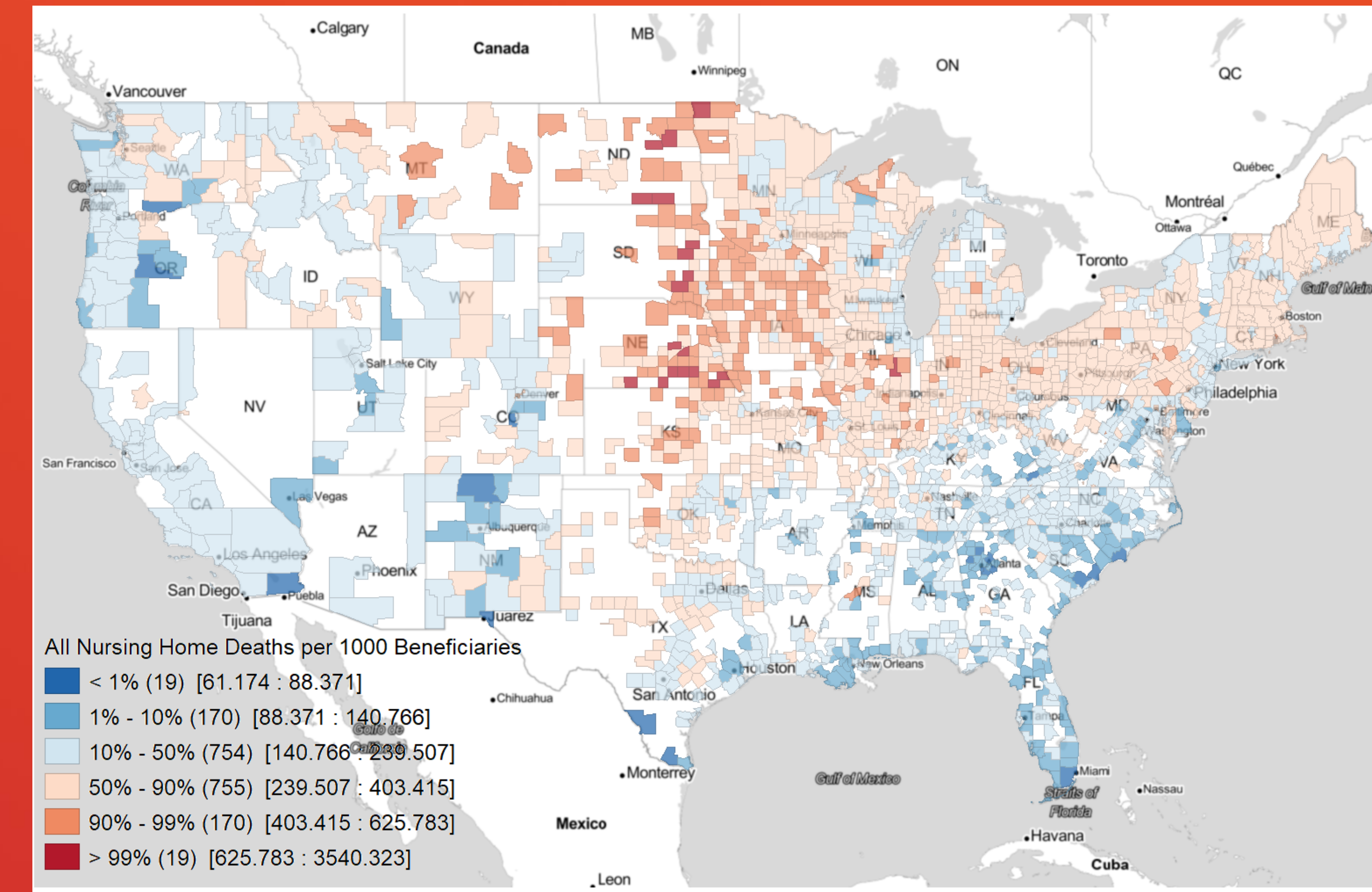


Accidental Nursing Home Deaths per 1000 Beneficiaries

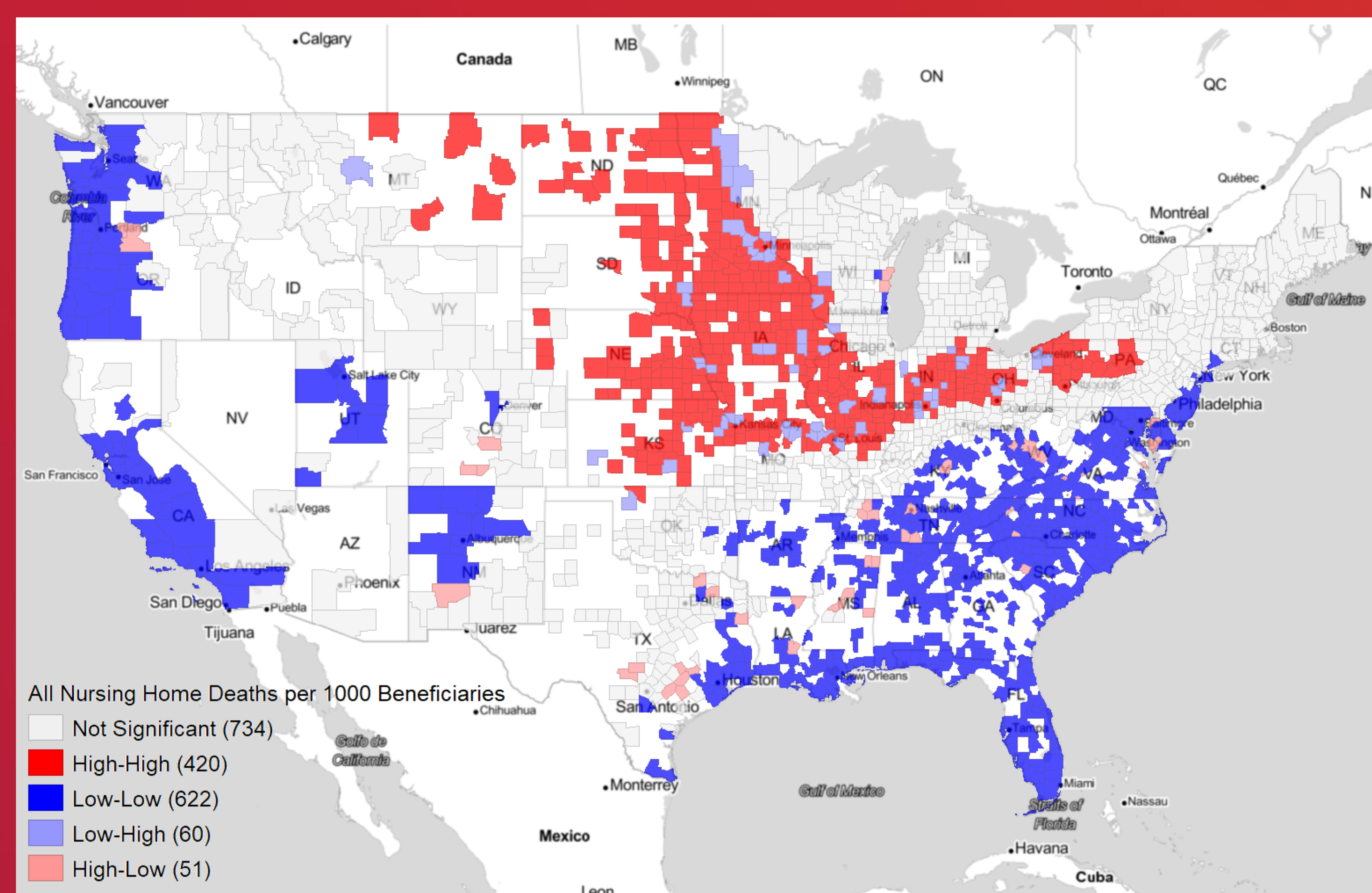


Percentile

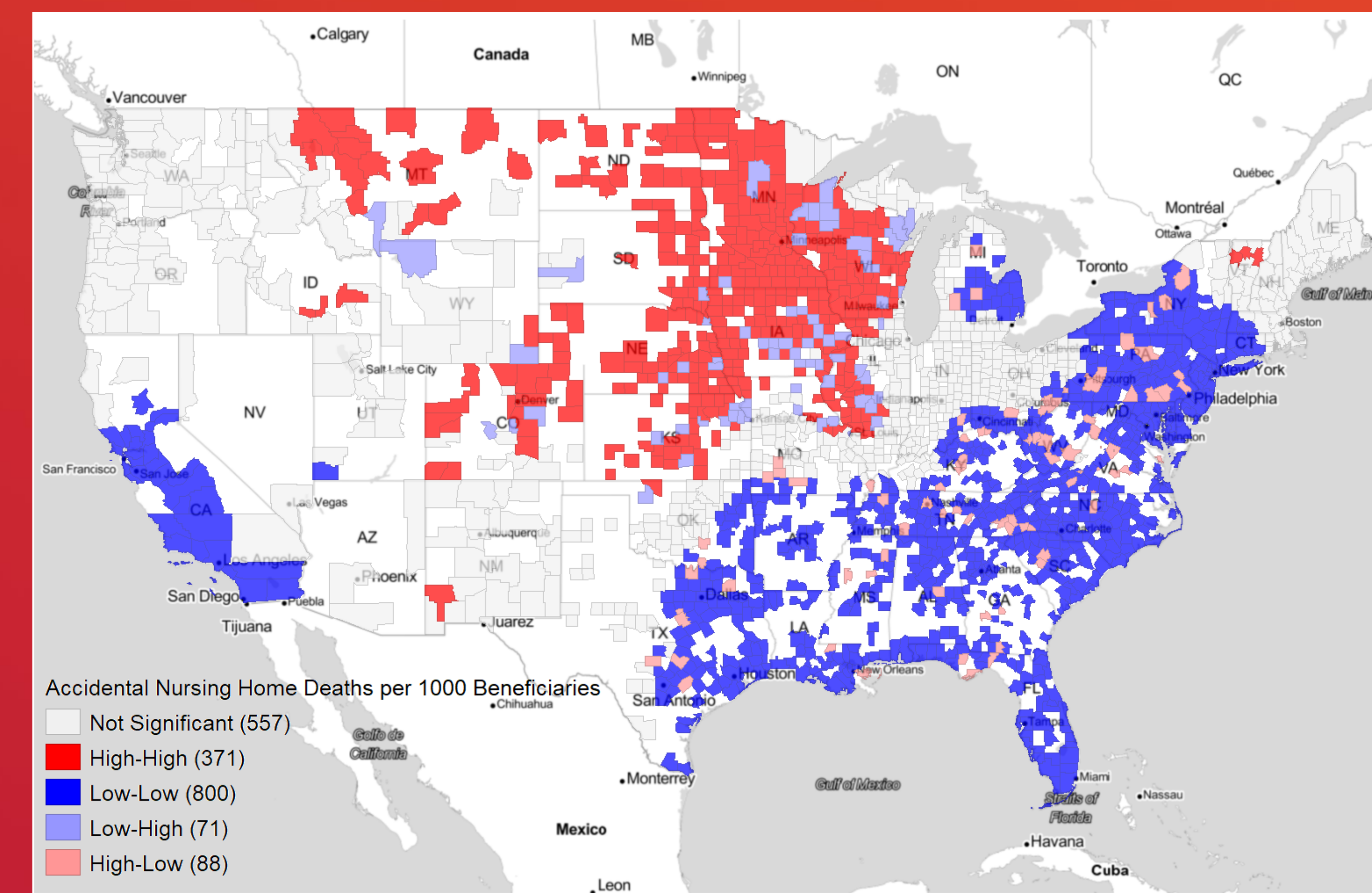
All Nursing Home Deaths per 1000 Beneficiaries



Percentile



Cluster Analysis



Cluster Analysis

DISCUSSION

There is a geographic correlation between High-High and Low-Low clusters which suggests counties which would benefit from targeted prevention efforts. There are confounding factors such as the availability and access to nursing homes which could explain skews in the data toward greater deaths in places with lower poverty. It is possible there is a concentration of older adults in areas with fewer nursing homes. This work identifies opportunities for directed efforts to combat elder neglect such as warranting greater surveillance and policies which protect older adults.

ACKNOWLEDGEMENTS

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REFERENCES

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- <https://geodacenter.github.io/>