Mapping the Impact of Food Scarcity and Marginalization on Obesity and Diabetes

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Abstract/Background

- **Research Topic:** Investigates the impact of food scarcity and marginalization on obesity and diabetes rates in New York State.
- **Research Question:** "How does food scarcity and marginalization contribute to higher rates of obesity and diabetes in different counties in the State of New York?"
- **Relevance:** The study explores how food access disparities influence health outcomes, aiming to guide policies for health equity, zoning, and community health improvement.

Additional Methods/Results

A regression was performed on obesity prevalence and population with low income and lower access to groceries to determine the relationship between the two variables.

Statistics of the correlation (Table 1) had shown that there is a significant linear relationship between them (p-value < 0.05).

After plotting the data points onto a scatter plot and fitted a regression line (Table 2), a positive linear relationship can be seen between the two variables, indicating a positive relationship between the obesity prevalence and population with low income and lower access to groceries.

Source	SS	df	MS		
Model	1581.58078	1	1581.58078	Number of obs	= 3,142
Residual	56716.0415	3,140	18.0624336	F(1, 3140)	= 87.56
				Prob > F	= 0.0000
				R-squared	= 0.0271
				Adj R-squared	= 0.0268
Total	58297.6223	3,141	18.5602108	Root MSE	= 4.25

obesity_pre	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
erc_pop_low_income~y	.0955171	.0102076	9.36	0.000	.0755029	.1155314
_cons	34.9191	.1148114	304.14	0.000	34.69398	35.14421

Table 1. Correlation Statistics.

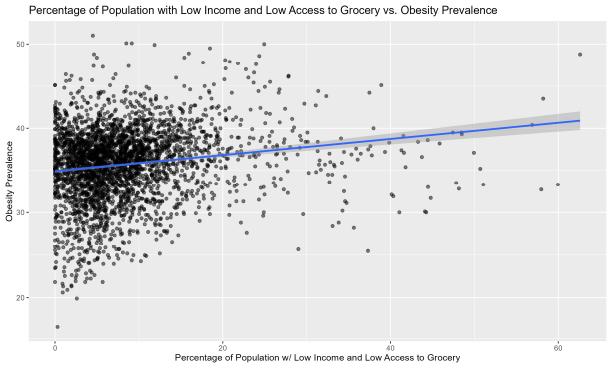
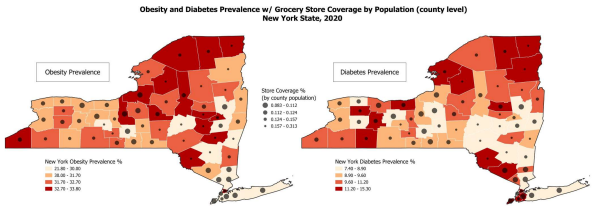
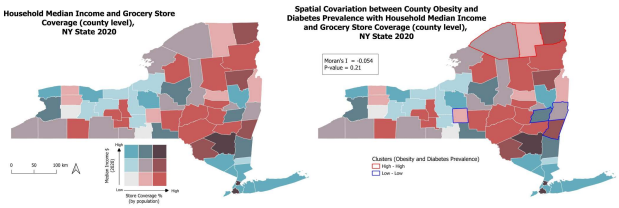


Table 2. Correlation Scatter Plot



Map 1. Obesity and Diabetes Prevalence with Grocery Access.



Map 2. Cluster Visualization of Determine Factors.

Methods

Prevalence of obesity and diabetes are first mapped out according to the equal quantiles of each county in the New York State using the data from 2020. The darker the color, the higher the prevalence (Map 1).

In order to get a better visualization of the relationship between obesity/diabetes prevalence and store access rate, grocery store coverage rate calculated based on the population for each county is mapped in circles with different sizes of circumferences.

The Moran's I was used to determine the geographical correlation between the obesity prevalence and the diabetes prevalence within the counties of New York State. It is then overlayed onto the bivariate map to further demonstrate the clustering of the variables (Map 2).

Discussion/Conclusions

The statistics tables and maps created to answer the research question all showed a significant relationship and clustering of the variables investigated. Specifically, the correlation between the obesity prevalence and the percentage of low income population with lower access to groceries demonstrates the impact of food scarcity on health of the local population.

The clustering demonstrated by the maps showed the tendency of higher prevalence of obesity and diabetes at lower grocery coverage counties in the State of New York.

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References

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Gillespie et al. (2022)

Huang (2021)