I analyzed the links between income, food insecurity and obesity using state-level data from the U.S. Census Bureau and CDC. Many studies have shown that lower income is associated with increased obesity[[1]](#footnote-0)[[2]](#footnote-1)[[3]](#footnote-2). The framework of social determinants of health indicates that material conditions confine one’s access to healthy food[[4]](#footnote-3)[[5]](#footnote-4). Indeed, other studies have found an association between income and food insecurity[[6]](#footnote-5)[[7]](#footnote-6), and between food insecurity and obesity[[8]](#footnote-7).

This study uses multivariate regression analysis to test the hypothesis that food insecurity partially mediates (explains) the relationship between income and obesity. I performed data cleaning and scaling, followed by regression analysis (bivariate and multivariate) and correlation analysis. I then transformed data in order to perform a chi squared test and created data visualizations.

Results were consistent between statistical tests.

* Results showed an insignificant, weak negative association between income and obesity.
* Results showed a significant, moderate positive association between obesity and food insecurity.
* Results showed an insignificant, very weak negative association between income and food insecurity.

The partial mediation hypothesis is not supported at the state level. State-level comparison did not show the relationships that have been repeatedly found between income and obesity, and income and food insecurity. State average data does not account for income disparities, which may obscure the relationships. Future research should test the partial mediation hypothesis between individual households on a smaller scale. State average data also does not account for the rural-urban divide. Future research should consider the role of rurality in mediating the relationship between income and food insecurity, and income and obesity. Future research should also test the significance of social determinants of health such as access to healthcare and stress in explaining the relationship between income and obesity.

1. McLaren, L. (2007). Socioeconomic status and obesity. *Epidemiologic Reviews, 29*(1), 29–48.<https://doi.org/10.1093/epirev/mxm001> [↑](#footnote-ref-0)
2. Sobal, J., & Stunkard, A. J. (1989). Socioeconomic status and obesity: A review of the literature. *Psychological Bulletin, 105*(2), 260–275.<https://doi.org/10.1037/0033-2909.105.2.260> [↑](#footnote-ref-1)
3. Marmot, M. (2002). The influence of income on health: Views of an epidemiologist. *Health Affairs, 21*(2), 31–46.<https://doi.org/10.1377/hlthaff.21.2.31> [↑](#footnote-ref-2)
4. Marmot, M. (2002). The influence of income on health: Views of an epidemiologist. *Health Affairs, 21*(2), 31–46.<https://doi.org/10.1377/hlthaff.21.2.31> [↑](#footnote-ref-3)
5. Reidpath, D. D., Burns, C., Garrard, J., et al. (2002). An ecological study of the relationship between social and environmental determinants of obesity. *Health & Place, 8*(2), 141–145.<https://doi.org/10.1016/S1353-8292(01)00028-4> [↑](#footnote-ref-4)
6. T, Li. (2023). "Household food insecurity in Canada, 2022." *Household food insecurity in Canada, 2022*. Retrieved March 5, 2024, from<https://proof.utoronto.ca/resource/household-food-insecurity-in-canada-2022/>. [↑](#footnote-ref-5)
7. Anon. (2009). "World agricultural production, resource use, and productivity, 1961–2020." *USDA ERS - Home*. Retrieved March 5, 2024, from<https://www.ers.usda.gov/>. [↑](#footnote-ref-6)
8. Pan, L., Sherry, B., Njai, R., & Blanck, H. M. (2012). "Food insecurity is associated with obesity among US adults in 12 states." *Journal of the Academy of Nutrition and Dietetics, 112*(9), 1403–1409.<https://doi.org/10.1016/j.jand.2012.06.011>. [↑](#footnote-ref-7)