Food Insecurity Index

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Background

Food insecurity rates can act as a bellwether for economic, health, and social burdens in communities. While food insecurity is experienced in all counties in every state and affects households of all races and ages, food insecurity rates tend to be higher in BIPOC households due to systemic and generational discriminatory wage, health, and policing practices and policies.

Community health improvement efforts must link data with action. Improving a community's access to food can improve other health and social outcomes, such as hospital readmissions, financial burdens for medication purchasing, and school readiness and attendance.[1-4]

Food insecurity is well known to be a strong correlate with other household and community measures of financial stress, such as Medicaid enrollment, SNAP enrollment, and mental health burden. The Food Insecurity Index created by Conduent Healthy Communities Institute summarizes multiple socio-economic and health indicators into one composite score for easier identification of high need areas by zip code, census tract, or county.

Selection and Weighting of Index Components

Social, behavioral, and economic estimates for 2021 were obtained for all U.S. counties, zip codes, and census tracts from the Claritas 2021 datasets. Components considered for inclusion in the index were selected based on the strength of their Pearson correlation coefficient with hospital and emergency room patients exhibiting characteristics of social and economic burden and SNAP eligible populations at the zip code and county level. The components of the Food Insecurity Index are listed in the table below.

Topic	Indicator
Income	Average Household Expenditures/Household Income
Household	Female-Headed Single-Parent Households with Children
Health Insurance	Percent of Adults with Medicaid Insurance
Behavioral Health	Percent of Adults who Perceive their Health as Poor

Component indicators were then standardized into z-scores, in which they were transformed to a z-distribution with a mean value of zero and a standard deviation of one. The final index score was calculated as a weighted average of the component z-scores. The optimal weighting for each component indicator was determined by examining the correlation between county and zip code hospital and ER patient characteristics and SNAP eligible

populations. The weighting ratios that resulted in the highest correlation with the outcome measures at the county level and zip code levels were selected.

Presentation of Index Values Within a Community

Final index values range from 0-100, representing the percentile of each zip code among all U.S. zip codes and each census tract for all U.S. census tracts. For counties, the 0-100 index value represents the percentile of each county among all U.S. counties. Within the community, the index values are grouped into five ranks, where a low rank represents a low level of need and a high rank represents a high level of need. These ranks are determined using natural breaks classification, which groups the zip codes or counties into clusters based on similar index values. This method minimizes the variance within a rank, and maximizes the variance between ranks. All zip codes with a population of over 300 persons, as reported by Claritas estimates, are included in the Food Insecurity Index. Those with populations under 300 persons are excluded.

References
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