

# 2014 Community Health Index Methodology

## Background

Community health improvement efforts must determine what sub-populations are most in need to effectively focus services and interventions. While health data is essential in identifying disparities, limitations in the granularity of health indicators limit their utility in identifying relative need. Many measures of population health are published at the state and county level and are rarely available for sub-county geographies.

Social and economic indicators for which estimates are available at the sub-county level can provide insight as to what populations are most in need. Social and economic factors are well known to be strong determinants of health outcomes – those with a low socioeconomic status are more likely to suffer from chronic conditions such as diabetes, obesity, and cancer. The correlation between socioeconomic status and health has been well documented<sup>1</sup>.

HCI advises that social and economic factors be considered when assessing community health needs but recognizes the complicated nature of analyzing a large number of inter-related indicators with various levels of impact on health outcomes. In order to summarize socioeconomic indicators in a way that is meaningful to understanding community health needs for specific zip codes, HCI has developed the Community Health Index.

## Selection and Weighting of Index Components

Social and economic estimates are obtained for all U.S. counties, zip codes, and census tracts from Claritas Pop-Facts® demographics estimates. Components considered for inclusion in the index were selected based on the strength of their Pearson correlation coefficient with premature death outcomes at the county level. Additionally, the components were validated at the zip code level based on the strength of their Pearson correlation coefficient with preventable hospitalizations (an aggregate of heart failure, COPD, diabetes, and UTI rates). The components of the Community Health Index are listed in the table below.

Topic	Indicator
Income	Average Household Income
Poverty	Families Below Poverty
Unemployment	Percent of Civilian Labor Force Unemployed
Occupation	Percent of Employed Civilian Population in White Collar Occupation
Education	Population 25+ with a High School Degree or Higher
Language	Population 5+ that Speaks Only English at Home

The final index score has a Pearson correlation coefficient of 66% with the summarized preventable hospitalization rate. The final index score for US counties has a Pearson correlation coefficient of 73% with the premature death rate for 2008-2010.

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 the final index score and premature death and preventable hospitalization rates. The weighting ratios that resulted in the highest correlation with premature death rates at the county level were selected. These weighting ratios also resulted in one of the highest possible correlations with preventable hospitalization rates for a sample of over 2,700 zip codes.

## **Presentation of Index Values Within a Community**

Final index values range from 0-100, representing the percentile of each geographic location within the entire U.S. 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 locations into clusters based on similar index values. This method minimizes the variance within a rank and maximizes the variance between ranks. All locations with a population of over 300 persons, as reported by Claritas population estimates, are included in the Community Health Index. Those with populations under 300 persons are excluded.

### *References*

1. Socioeconomic determinants of health. The contribution of nutrition to inequalities in health. James, W.P., et al., et al. 7093, May 24, 1997, BMJ, Vol. 314, pp. 1545–1549.