HIDI HealthStats

Statistics and Analysis From the Hospital Industry Data Institute

DECEMBER 2014

IT TAKES A COMMUNITY – POPULATION HEALTH IN MISSOURI

Key Points:

- The traditional delivery of health care is moving beyond the walls of hospitals and into patients' communities.
- Individuals with poor health face added difficulty in improving their socioeconomic status and in turn, chronically low SES results in chronically low health status over time.
- Community health needs assessments provide hospitals with the opportunity to identify the upstream clinical and social factors affecting population health in their communities.
- The Hospital Industry Data Institute has developed a set of community health measures that are harmonized with the Robert Wood Johnson Foundation's County Health Rankings data. The measures were extended to the ZIP code level to allow more precise evaluations of community health in populations smaller than the county level in Missouri.

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Background

With new paradigms in population health management and accountable care, the traditional delivery of health care is moving beyond the walls of hospitals and into patients' communities. Providers are focusing on upstream[i] social determinants of health that often result in poor physical health outcomes. These "upstreamists" — doctors, nurses, social workers and other hospital-based community health specialists will prescribe changes to patients' physical and social surroundings to prevent chronically-exacerbated illnesses as readily as they prescribe conventional medicines to manage symptoms. The acceptance of the notion that an individual's community and social context has a larger impact on their health outcomes than their genetic markers is a growing phenomenon in medicine.

Poor health and poor socioeconomic status share a cyclical relationship. Children born into low SES households and communities are more likely to have poor health outcomes. Individuals with poor health face added difficulty in improving their SES and, in turn, chronically low SES results in chronically low health status over time. The SES-health cycle is said to be "intractable, circular and difficult to break."[ii] Curing the upstream social and community contextual determinants of health outcomes and disparities requires a systems approach that leverages all of a community's available resources, including hospitals and health systems. Operating in siloes, hospitals and health systems cannot, and should not be expected to successfully improve the health of communities.[iii]

One example of an upstream community health initiative headed by a traditional health system, with support from a broad set of community stakeholders, is featured in this month's edition of *Health Affairs*, which is devoted to community health. BJC HealthCare's Raising St. Louis initiative is a home visitation model that focuses on children from low SES ZIP codes in St. Louis. The intervention focuses on children's health from prenatal through third grade, and also equally important, their educational achievement and reading comprehension. Children who read proficiently in third grade are four times more likely to graduate on time from high school — a powerful predictor of socioeconomic health and in turn, a powerful predictor of physical health.[ii]

Community health needs assessments provide hospitals with the opportunity to identify the upstream clinical and social factors affecting population health in their communities. CHNAs provide an opportunity for hospitals to identify and form relationships with other community stakeholders for the purpose of improving population health.

CHNAs are based on the evaluation of solid community health and social factor data. A common impediment to the successful identification of a community's most acute needs is the lack of community-level data that are granular enough to identify areas in most need of intervention. The purpose of this issue of *HIDI HealthStats* is to develop and make available community-based health and social factor data at the ZIP code level in Missouri.

Improving Health Status

The Affordable Care Act, signed into law in March 2010, requires hospitals with tax-exempt status to assess, document and work to improve the health status of the community served. The majority of hospitals completed their initial CHNAs in 2012 and 2013, and will begin reassessing in 2015 to comply with the law's three-year assessment cycle.

The following steps provide a framework for conducting a CHNA and meeting hospitals' ACA CHNA requirements.

1. Define the community served by a hospital facility.
2. Identify the partners and individuals representing the broad interests of the community.
3. Gather available secondary data and assessments.
4. Develop and conduct primary research.
5. Aggregate primary and secondary research.
6. Identify and prioritize community health needs.
7. Develop and widely disseminate the written assessment.
8. Develop and implement a strategy to address the identified priority health issues.

MHA will provide new CHNA guidance and a toolkit in early 2015.

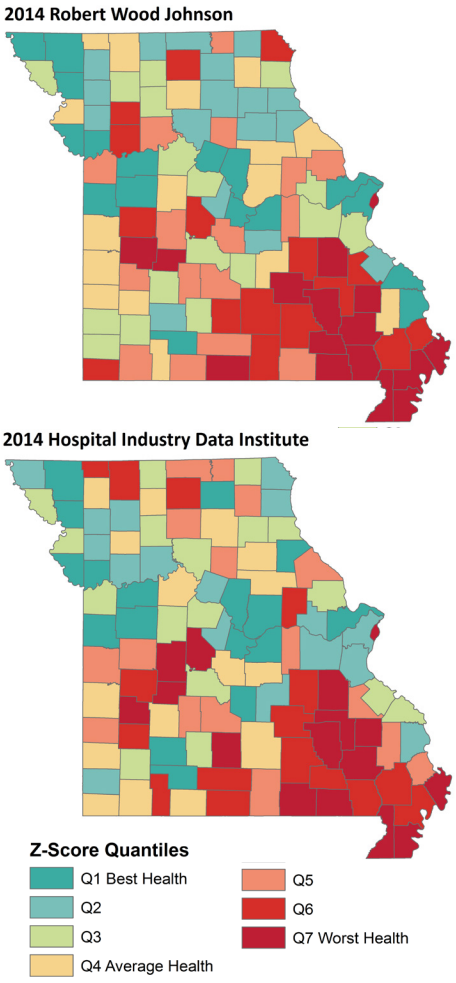
County-Level Health And Social Factor Data

A commonly used source of data for CHNAs is the Robert Wood Johnson Foundation's County Health Rankings project.[iv] Developed by researchers at the University of Wisconsin Public Health Institute, in Madison, Wis., County Health Rankings offers a robust set of measures and data on social and clinical health factors for every county in the U.S. The data are gathered from multiple sources and grouped into two domains — health factors and health outcomes. All health factors and health outcomes measures are calculated as Z-scores[1] for each state, weighted, and then converted into comparative indices to rank each county on health factors and health outcomes compared to other counties in the same state. Thirty-four different health factors and health outcomes measures are used to calculate the index for each county.

While unprecedented in its robustness in terms of providing a combined community health database at the county level, the County Health Rankings data are subject to limitations. First, the rankings should be interpreted in relative terms. The comparative indices and z-scoring are relative to other counties in the same state, so highly ranked counties in states with poor health and social supports may be ranked much lower in the national distribution.

A second limitation is that ecological fallacy is particularly acute with data for larger geographies and populations. Ecological fallacy is the false assumption that every individual has the same characteristics of the larger group to which they belong.[v] A common concern for hospitals is basing their CHNAs solely on county-level data because the data are perceived as too large to meet the definition of a community, and county-level data will be less likely to produce measurable differences following a community health intervention.

Figure 1: 2014 County Health Rankings Average Health Factors and Health Outcomes Z-Scores, RWJ Actual Compared to the HIDI Harmonized Estimate



Community-Level Health And Social Factor Data

Because of the ecological fallacy limitation, the Hospital Industry Data Institute staff sought to develop a measure harmonized with the County Health Rankings measures using data that also are available at the ZIP code level to extend the results to more granular geographies that more closely resemble the typical definition of a community. Staff drew health outcomes data from the Missouri inpatient and outpatient

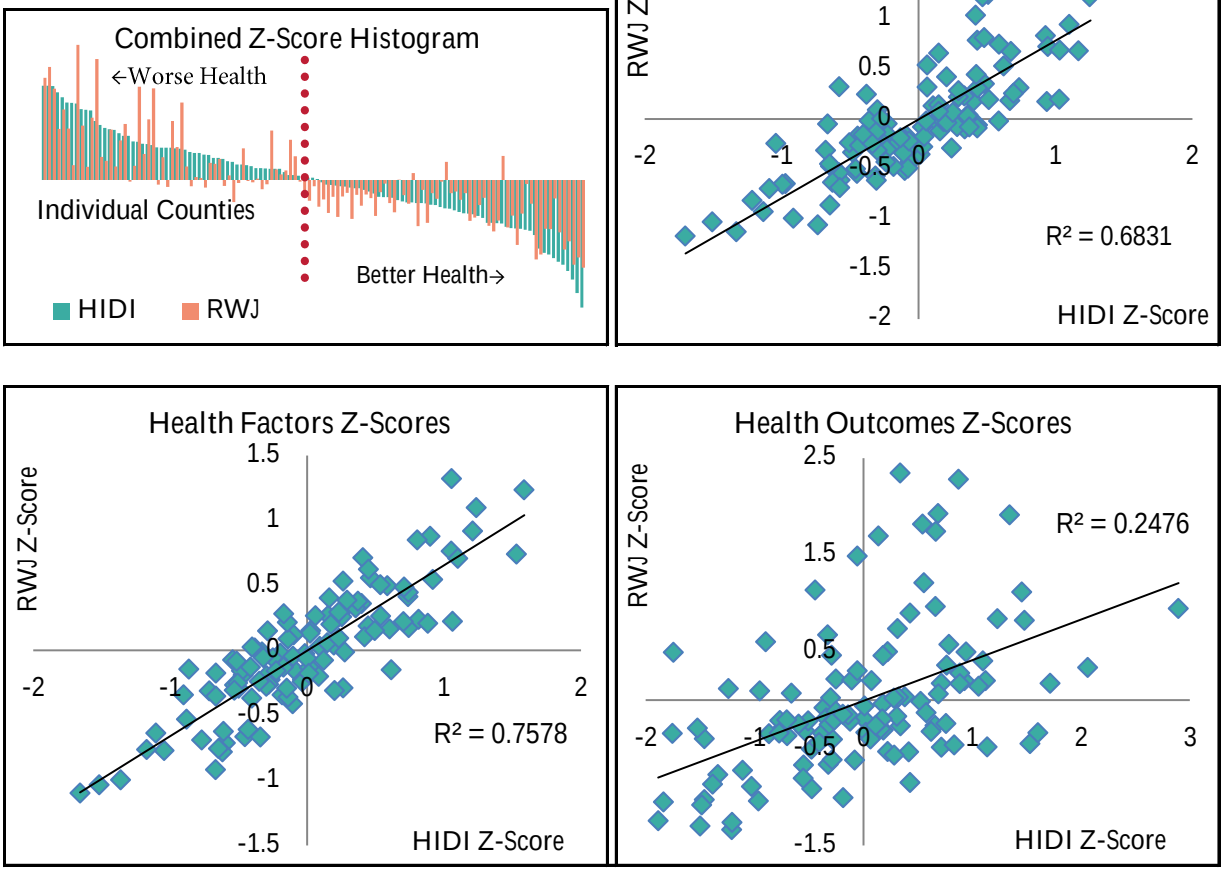
1 *A Z-score is a standardized measure of variance that calculates the number of positive or negative standard deviations an observation is from the mean of its distribution.*

hospital discharge databases for fiscal years 2012 to 2014 and health factor measures from 2014 PopFacts Premier data from Nielsen-Claritas. A geographic comparison of the HIDI harmonized county-level estimates to the 2014 RWJ measures is presented in Figure 1. The purpose of data harmonization is to ensure consistency in various measures from disparate sources that attempt to estimate similar relationships, and to facilitate the extension of the measures across different settings and populations.[vi] In this case, the purpose is to extend a commonly accepted set of population health and social factor data to more granular geographic settings and population groups to inform the delivery of targeted community health interventions.

HIDI Health Outcome Measures

Health outcome measures used in the HIDI harmonized estimates included the prevalence of chronic diseases and the rate of in-hospital mortalities among Missouri patients. The rate of chronic disease was estimated with data for unique patients diagnosed with a chronic condition in a Missouri hospital inpatient setting, outpatient setting or emergency room during fiscal year 2013 (n = 12.4 million visits by 3 million unique patients). Chronic disease diagnoses were identified with the Agency for Healthcare Research & Quality's Clinical Classifications Software using definitions provided by the Missouri Department of Health & Senior Services.[vii] The chronic diseases included were chronic obstructive pulmonary disease, diabetes, hypertension, heart disease, asthma, stroke, arthritis, kidney disease, liver disease, atherosclerosis and cancer. The number of unique patients with each condition was totaled and calculated as a rate of the 2014 population for each county. In-hospital deaths were identified by patients with expired discharge disposition codes (20, 40, 41 or 42). The total number of hospital deaths between fiscal years 2012 and 2014 was totaled for each county and calculated as a rate of the population. Z-scores were calculated for each county for both of the health outcomes measures — the rate of chronic conditions and mortality. The overall health outcome Z-score

Figure 2: 2014 County Health Rankings Z-Score Correlation Plots, RWJ Actual Compared to HIDI Harmonized Estimates



for each county was derived with the unweighted average Z-score of the two measures.

HIDI Health Factor Measures

Social health factor data used in the HIDI harmonized county health rankings estimates included median household income, median age, population density, the percent of families below poverty, the unemployment rate, the number of health care workers per 100 total population, the percent of the population 25 and older with a college education and the same percent with less than a high school education. Again, Z-scores were calculated for each measure for each county and the unweighted average was used as the overall health factors score. The scores for median income, college educated and health care workers were scaled by negative one to maintain the additive property of the overall health factors score.

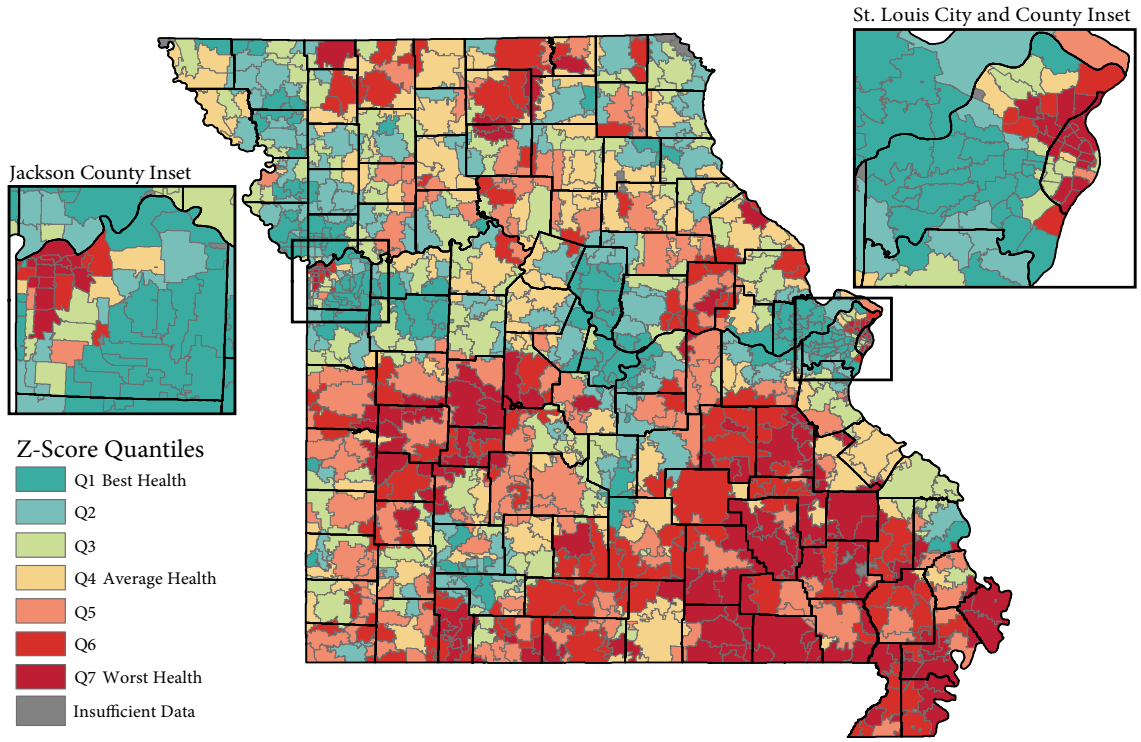
Results

Figure 2 includes a panel of the results of the HIDI harmonized estimates for the health factors and health outcomes domains and the combined score which was calculated as the unweighted average Z-score for each domain. The upper-left quadrant shows the distribution of the combined Z-scores for the HIDI and RWJ measures at the county level in Missouri. Higher Z-scores reflect poorer health outcomes and social factors, while negative Z-scores indicate better than average combined health outcomes and social factors. The bottom left quadrant of Figure 2 includes a scatter plot comparing the 2014 RWJ health factor Z-scores for Missouri counties to the HIDI harmonized estimates. The HIDI measures featured a strong correlation with the RWJ measures and explained 76 percent of the variance in the data. The HIDI health outcomes estimates featured more noise than the health factors measure. However, a positive association was observed and one-quarter of the variance in the RWJ data was explained by the HIDI model. The combined HIDI Z-scores featured a strong positive association with the RWJ measures and explained 68 percent of the overall variance in the data.

Discussion

The harmonized estimates were extended to the ZIP code level using the same measures and methods as the county-level harmonized estimates. ZIP codes with fewer than 100 residents in 2014 or 30 unique patients in fiscal year 2013 were excluded to improve reliability. In total, 955 (97 percent) ZIP codes were scored and ranked, while only 30 had insufficient data. Figure 3 shows the geographic distribution of the HIDI combined Z-scores at the ZIP code level. By and large, the ZIP code level results resemble the HIDI and RWJ county-level results displayed in Figure 1; however, the St. Louis area inset includes a strong example of how more granular community health and social factor data can avoid issues arising from the ecological fallacy. According to the County

Figure 3: HIDI 2014 ZIP Code Level Average Health Factors and Health Outcomes Z-Scores



Suggested Citation

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Health Rankings data, St. Louis County is among the healthiest in Missouri with a 2014 rank of 10th-best in the state. This may be an accurate assessment when aggregated over nearly 1 million residents from varied social strata; however, pockets of North St. Louis County, including Ferguson, Mo., feature some of the poorest health outcomes and lowest socioeconomic status ZIP codes in the state. Many of these communities feature unaccredited school districts, limited access to primary health care or nutritious food outlets, and few opportunities for employment and health benefits.

Conclusion

The HIDI harmonized county health ranking data correlate closely with widely-accepted community health data from the RWJ Foundation and University of Wisconsin Population Health Institute. The extension of the HIDI data to more granular levels may be helpful to hospitals and other community health agencies in targeting upstream interventions designed to improve population health. The full county and ZIP code level HIDI dataset is available for download at: www.mhanet.com/hidiimages/documents/2014_MO_Comm_Health_Public.xlsx.

[i] *Manchada, R. What makes us get sick? Look upstream. TED Talk. Available online: http://healthbegins.ning.com/page/new-ted-book-the-upstream-doctors.*

[ii] *Goldman, T. Building healthy communities beyond the hospital walls. Health Affairs (Millwood). November 2014. 33:11 (1887). Available online: http://content.healthaffairs.org/content/33/11/1887.abstract?=right.*

[iii] *Weil, A. It takes a community. Health Affairs (Millwood). November 2014. 33:11 (1886). Available online: http://content.healthaffairs.org/content/33/11/1886.full?=right.*

[iv] *County Health Rankings. 2014. Available online: http://www.countyhealthrankings.org/.*

[v] *Freedman, D. Ecological inference and the ecological fallacy. International Encyclopedia of the Social & Behavioral Sciences. University of California, Berkeley. Technical Report No. 549. October 1999. Available online: http://web.stanford.edu/class/ed260/freedman549.pdf.*

[vi] *National Quality Forum. Guidance for measure harmonization: A consensus report. Washington DC: NQF 2010. Available online: http://www.qualityforum.org/Publications/2011/05/Guidance_for_Measure_Harmonization.aspx.*

[vii] *Missouri Department of Health & Senior Services. Chronic Disease MICA. 2014. Available online: http://health.mo.gov/data/mica/ASPsChronicDisease/header.php?cnty=929*

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