



HIDI HealthStats

Statistics and Analysis From the Hospital Industry Data Institute

APRIL 2019 ■ Miles Away, Worlds Apart: Assessing Community Health Needs with exploreMOhealth



The Missouri ZIP Health Rankings data included on exploreMOhealth.org were updated on April 1 to reflect the most recent information on the health and social well-being of populations living in 940 Missouri ZIP codes. The updated data were generated by Missouri hospitals between fiscal years 2016 and 2018, and by the 2017 American Community Survey of the U.S. Census Bureau.

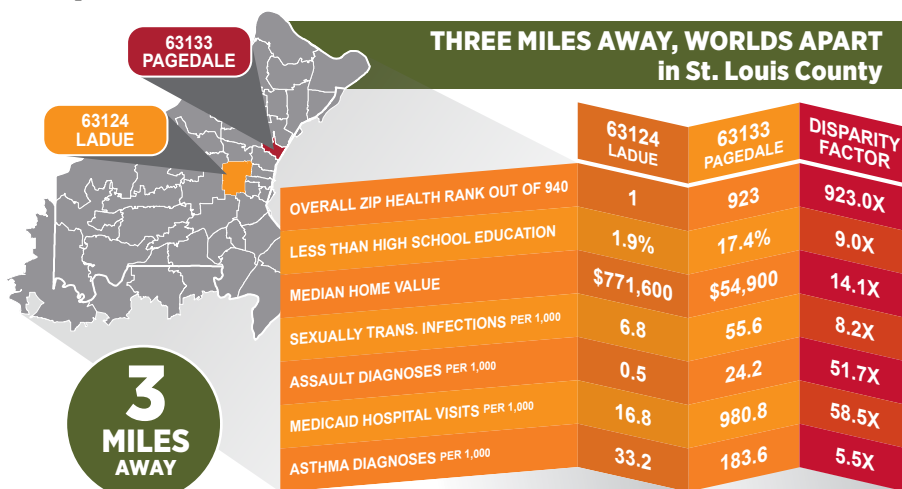
In addition to updating the timeframe, several new measures were added to the dataset, including hospital utilization for opioid misuse, dental caries and 13 prevention quality indicators on preventable inpatient admissions.

Combining health factors and outcomes, the state's healthiest ZIP code during the 2016-2018 study period was 63124 in the St. Louis County neighborhood of Ladue. At the opposite end of the distribution was 63955 near Oxly, Mo., in southeastern Ripley County, which ranked 940th. New data for 940 Missouri ZIP codes now is available at exploreMOhealth.org.



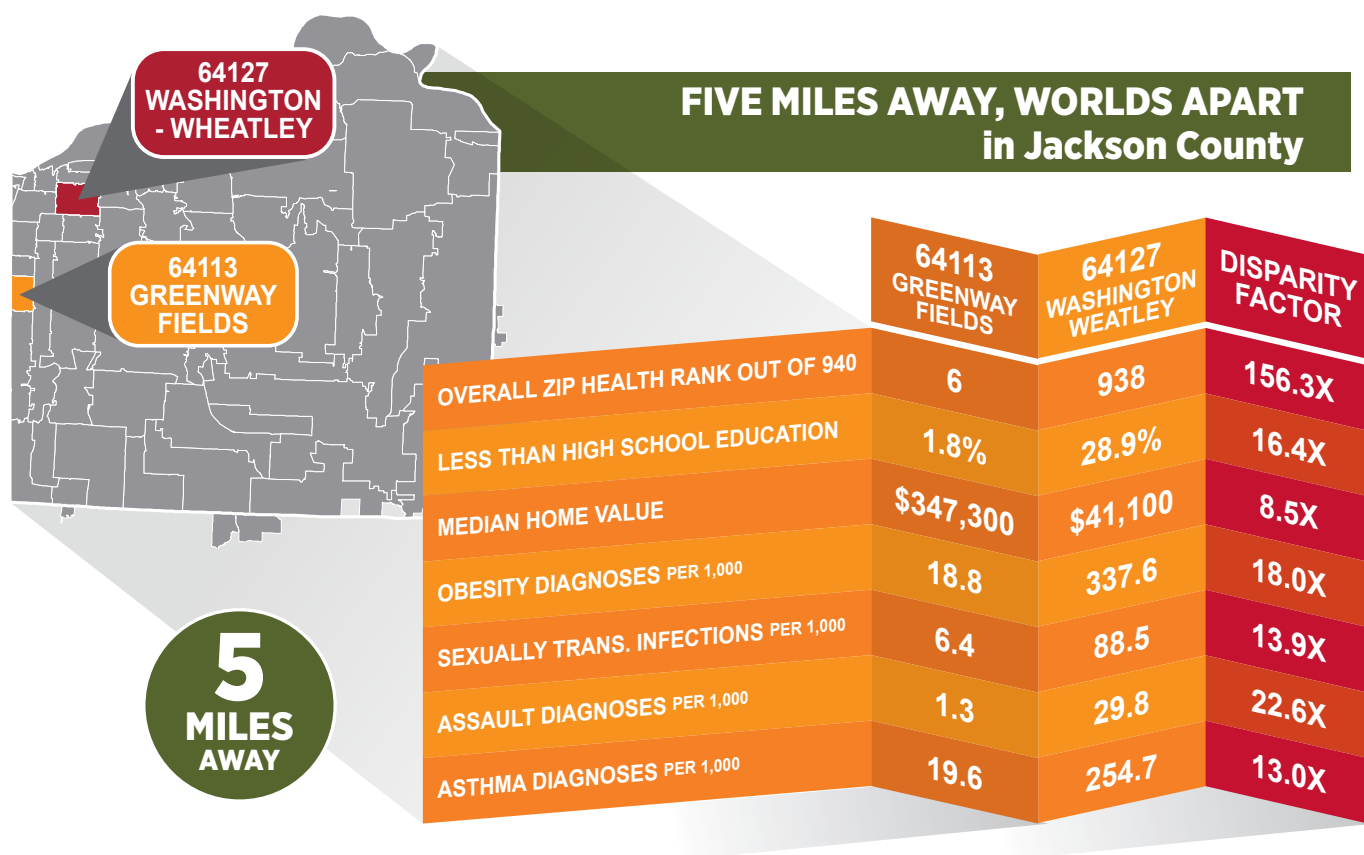
Background

The places where we live, work, learn and play affect our health. Examples throughout this brief show that communities often are separated by a distance of a few miles, but they can be worlds apart in terms of upstream health factors that result in downstream health outcomes, such as poor quality of life and premature mortality. The more that is known about these places, the better hospitals, clinicians and community-based partners can identify and address the influence of these factors on health. Assessing hundreds of community health and social factors within counties across Missouri is a powerful strategy for optimizing the allocation of scarce resources to maximize the effectiveness of community health improvement efforts.



In March 2018, the Missouri Hospital Association and Missouri Foundation for Health released [exploreMOhealth](https://exploreMOhealth.org), a community health needs assessment platform developed through a partnership with the University of Missouri's Center for Applied Research and Engagement Systems. The platform was designed to assist community health stakeholders in the development of impactful CHNAs using two rich sources of health-related data that are unique to Missouri — the Missouri County-Level Study from MFH, and the Missouri ZIP Health Rankings from the Hospital Industry Data Institute and Washington University School of Medicine.

Since its launch, [exploreMOhealth](https://exploreMOhealth.org) has been queried 12,000 times by 8,600 individual users, resulting in nearly 40,000 page views. Community health stakeholders from a variety of disciplines — hospitals, regional health commissions, local public health and community action organizations — are using the site to gain hyperlocal insights on the health and social well-being of their communities.



About the Data

The Missouri County-level Study is a periodic survey of the health-related behaviors and attitudes of Missourians aged 18 and older. The survey design is based on questionnaires and methods employed by the Behavioral Risk Factor Surveillance System of the U.S. Centers for Disease Control and Prevention.ⁱⁱ

The most recent CLS survey was conducted during 2016 and produced detailed health-related information from approximately 52,000 Missouri adults who were randomly selected to participate in the study via telephone interview. Administered by the University of Missouri Health and Behavioral Risk Research Center, the interviews generated data on the county-specific prevalence of behavioral risk factors, existing medical conditions, environmental health factors and preventive practices.

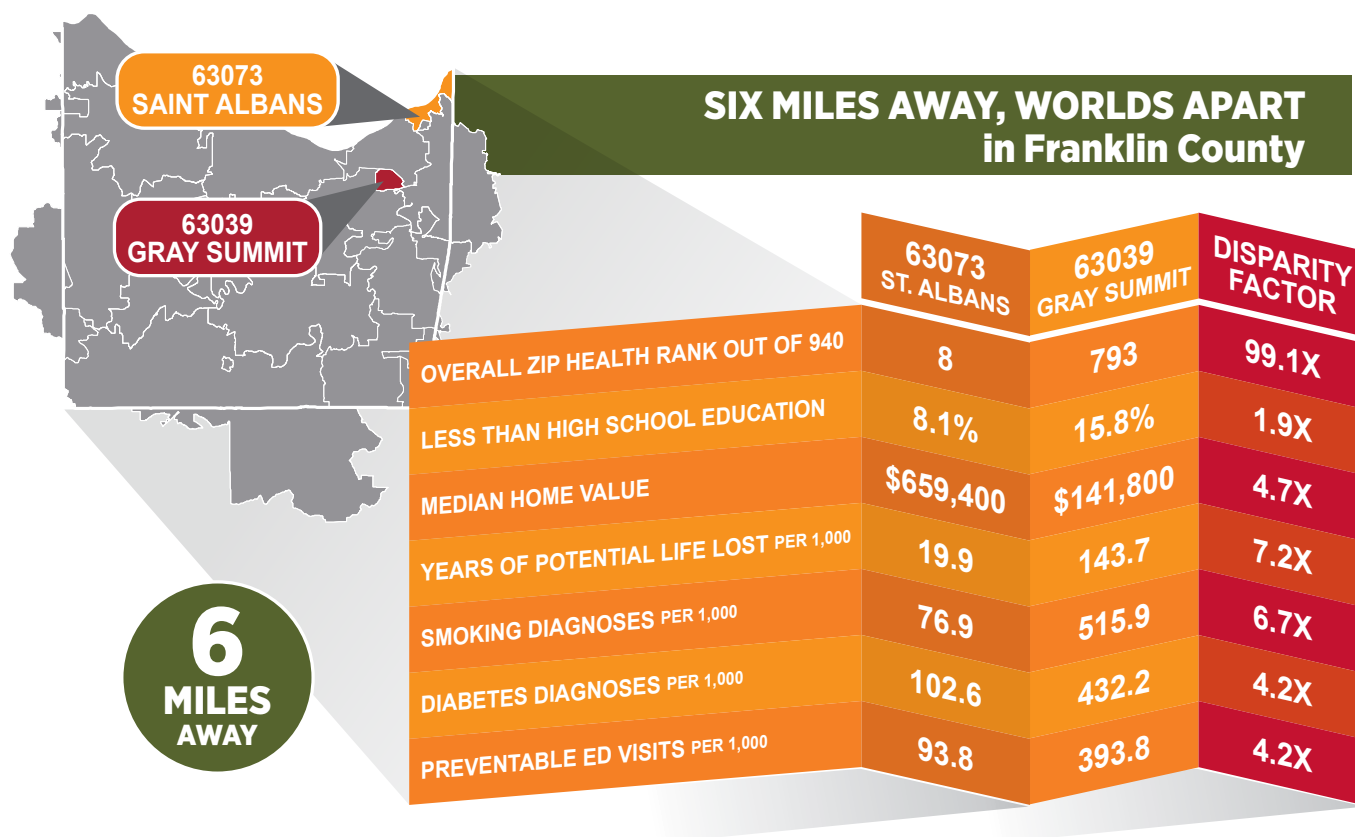
The information gathered from residents of all 114 Missouri counties and the

“We know that health and the factors that support health are not evenly – or randomly – distributed throughout a region. Even areas a small distance apart can differ significantly in terms of outcomes. That is why having access to ZIP code-level data is so important for community health promotion and action to address equity.”ⁱ — Jason Q. Purnell, Ph.D., Associate Professor at Washington University and For the Sake of All project leader

City of St. Louis is intended to assist community health stakeholders and researchers identify variation in health priorities and correlates at the county level. The study is funded by MFH and conducted in collaboration with the Missouri Department of Health and Senior Services.

The Missouri ZIP Health Rankings are designed to assist hospitals and community health stakeholders identify high-risk communities within counties to optimize the effectiveness

of community health improvement interventions. Developed through a partnership between researchers at HIDI, Washington University School of Medicine and BJC HealthCare, ZHR provide a unique approach to measuring community health at the ZIP code level using hospital discharge and American Community Survey data applied to the County Health Rankings model of population health.ⁱⁱⁱ The project was funded by The Robert Wood Johnson Foundation through a 2015 County Health Rankings Research



Grant award. The research team was guided by advisory committee members from academia, local public health agencies, hospital community benefit specialists and philanthropic organizations. Findings of the original study were presented at the annual meeting of the American Public Health Association and published in the *Journal of Public Health Management and Practice*.^{iv}

The methodological approach for ZHR is based on fitting hospital discharge and social factor data to each of the CHR domains and subdomains. The health outcomes domain consists of two subdomains, including quality of life (morbidity) and length of life (mortality). The health factors domain that contributes to differences in morbidity and mortality consist of four subdomains, including health behaviors, social determinants, clinical care and environmental factors.

“The Missouri ZIP Health Rankings project has been focused from its beginning on addressing the needs of people in Missouri who are working to improve the health of our communities. It’s been important for us to hear directly from our advisory group and others about what kinds of information they need to move their work forward.” — Elna Nagasako, M.D., Ph.D., MPH, Associate Professor at

Washington University School of Medicine, Senior Consultant for Access & Equity at BJC HealthCare, and Principal Investigator of the Missouri ZIP Health Rankings Project

Hospital discharge data are compiled throughout a three-year study period, and counts of selected diagnoses are aggregated at the ZIP code level for each subdomain. The counts then are calculated as rates of the affected population group for each measure evaluated and then standardized in deviations from mean. Rates for each ZIP code and indicator are subjected to a re-identification risk assessment and top-coded (i.e. winsorized) if tolerance thresholds are exceeded.

Principal components analysis is used to derive ranked indices for each ZIP code in Missouri with respect to each CHR domain and subdomain. The ZIP code-level scores are reapportioned to the county level to account for overlapping ZIP code and county boundaries, and compared to CHR results for validity. The ZHR data include more than 100 indicators on health factors and outcomes for each Missouri ZIP code with representative data.

exploreMOhealth Case Studies

BJC HealthCare

BJC HealthCare: Health happens where we live, work, learn and play. Social factors such as race, income, education and geographic area of residence are linked to patients' health outcomes, and access to healthy food, transportation and housing impact patients' ability to stay healthy.

One use for data on social factors and health outcomes is for identifying areas with high clinical and social needs. In maps of central and eastern Missouri, there is considerable variation in health factors and outcomes. Even within a given county, there can be tremendous variation across different neighborhoods, making access to both county and subcounty data important for understanding community needs. An integrated analysis that combines social factor data with clinical data

allows for a better understanding of community social and health challenges, and facilitates targeting interventions to the areas with greatest need. Karley King, BJC Community Benefit Program Manager, served on the advisory board of the Missouri ZIP Health Rankings project during its development and notes that she provides [exploreMOhealth](#) as a resource to individual hospitals to help them in their planning work.

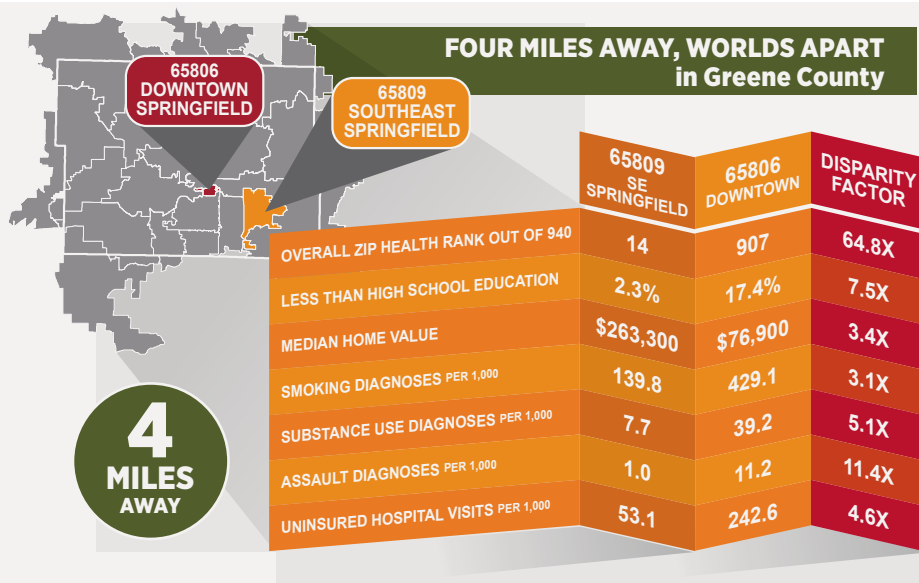
Secondly, as health care payment and accountability models shift from payment for activities to payment for value, it becomes essential to evaluate key contributors to these outcomes. Incorporation of social factor data allows a more complete picture of the factors influencing patient outcomes, experience and utilization. "As metrics such as readmissions have illustrated, understanding factors 'outside the walls' of the hospital and the quality of care experienced by different groups of

patients are becoming essential aspects of measuring high quality care," says Dr. Elna Nagasako, Senior Consultant for Access & Equity.

Finally, an important use for these types of data is to help providers working with individual patients to better understand the challenges patients are facing and to help connect patients to resources. Adrianna Webb-Hudson, social worker at Christian Hospital, used maps from [exploreMOhealth](#) to help design a presentation to share information on social determinants of health with other care managers at her hospital. "At the end of the day, it's about meeting patients where they are and sitting down with them to help them overcome the obstacles they may be facing," says Webb-Hudson. Being able to map data related to food insecurity, housing and emergency department use helped her visualize the challenges faced by her patients at the community level.



Carroll County Memorial Hospital: Improving health in Carroll County is a community effort that takes time, effort, resources, and most importantly, everyone involved. CCMH continuously strives to meet the needs of the communities we serve. By completing our community health needs assessment, we are able to identify the priority areas of concern. Utilizing the [exploreMOhealth](#) platform and ZIP Health Rankings, we have had the opportunity to gain access to unique data that expands on existing targeted information. Combining primary and secondary data, we are able to gain a better understanding of the health challenges that face our community. Through this process,



CCMH recognized factors both inside and outside of the medical system that influence the overall health of the citizens in our service area.

To close the gap, CCMH began a population health management journey in late 2016. Since then, the program has evolved from one registered nurse

offering only annual wellness visits to three RNs offering wellness visits in addition to chronic and transitional care management. Each program focuses on the best care for the patient while engaging the patient's care team. "One of the greatest assets of this program is a full care team for our patients," said Dr. Andy Horine, CCMH Chief Medical

Information Officer. “This starts with the folks who answer the phone and includes each provider’s nurse, as well as population health nurses, pharmacists, dietitians, nurse practitioners, physician assistants and physicians.”

Patients who participate in the transitional care management program benefit from medical assistance while transitioning safely and confidently from CCMH back to their home. The CCMH Population Health Team assists with coordinating follow-up appointments, ensuring medication adherence, and providing answers to any cumbersome questions that patients and their families may encounter. The program also provides access to a population health nurse who assists in coordinating care with a patient’s primary care provider for as much as one month after discharge. The chronic care management program

is designed to be a longer commitment to our patients who have two or more chronic conditions. CCM is offered to facilitate the best care for our patients by encouraging the patient and the patient’s care team to formulate individual goals, resulting in a higher success rate of goal achievement.

The Population Health Department also focuses on reducing inappropriate utilization and overutilization of the emergency department. Through education and bringing awareness of available community assistance to the forefront, this effort has successfully enabled noncompliant patients to thrive. This progress was achieved through the review and understanding of social determinants and engaging the patient’s care team to focus on all aspects of health care needs for the patient. The population health management program at CCMH

has provided a foundation for this designated patient population to meet care gaps and other measures that ensure patients are getting the care they deserve, while in many cases, avoiding hospitalization or emergency care. It has served as a great benefit to our rural health clinic patients by identifying chronic conditions earlier, setting in place a proactive care management system, and reducing noncompliance and expenses to the patient and health care system.

Going hand-in-hand with our mission, “We are dedicated to the health and well-being of all we serve,” CCMH prides itself in offering our patients exceptional programs based on advanced data analytics. We are able to achieve more accurate results with the information gained from [exploreMOhealth](#) and ZIP Health Rankings.



St. Louis Regional Health Commission:

As part of its mission to increase access to care while also improving the health

of uninsured citizens of St. Louis City and County, the St. Louis Regional Health Commission produces an annual “Access to Care” data book. The data book provides a comprehensive review of communitywide progress toward strengthening the health care system in the region through the careful analysis of operating statistics from primary, specialty, behavioral health and emergency care safety net health care provider institutions. In addition to providing a comprehensive review of the health care system within the region, this data book also aims to provide a more robust picture of access within the St. Louis region.

In 2018, RHC released *Geography Matters: The Impact of Regionality on Safety Net Access Trends in St. Louis* as a supplement to the 2017 Access to Care Data Book.^{viii} This issue brief was developed to highlight geographic access trends among safety net patients based on ZIP code

of residence and the location of safety net organizations where patients access service, and to highlight geographic gaps and potential targets for future safety net expansion. Key findings from the issue brief include the following:

- The areas with the highest unmet needs for safety net services appear to be North St. Louis County and South St. Louis City.
- The [exploreMOhealth](#) data indicate that North St. Louis County, North St. Louis City and South St. Louis City have the worst health outcomes in the region and some of the worst in Missouri.
- Central and West St. Louis County have relatively low rates of uninsured individuals and some of the best health outcomes in the state.
- General trends show gaps in safety net primary care service for North

St. Louis County and South St. Louis City. In the future, more exploration of the access patterns in South St. Louis County may be warranted.

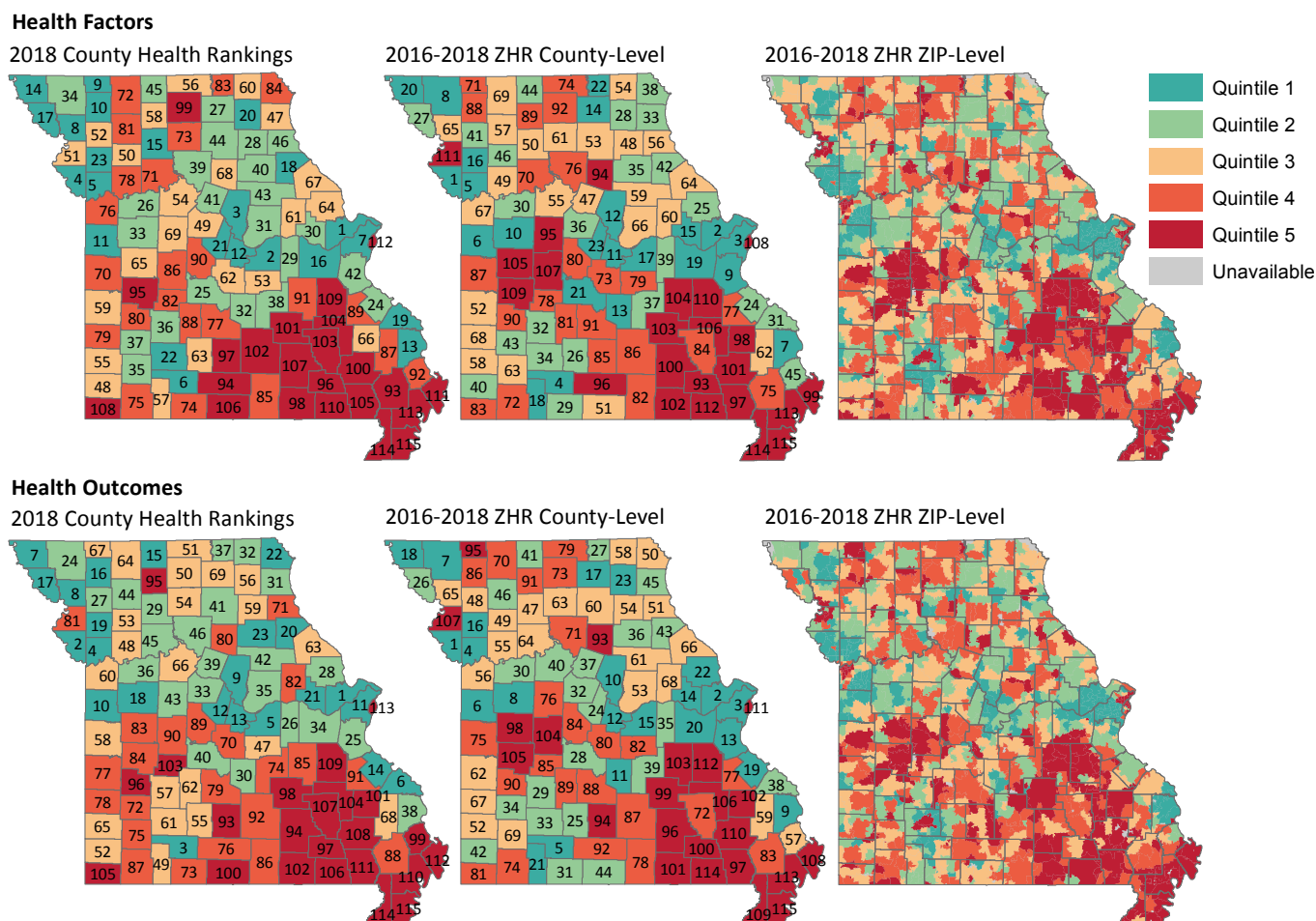
- General trends show high emergency care usage rates for uninsured individuals living in North St. Louis County and North St. Louis City.
- While an area of high need, North St. Louis City seems to be saturated with safety net access points at this time.

Building upon the key findings from the Geography Matters issue brief, RHC will continue creating spaces for continued dialogue around “access” in hopes to capture the lived experiences of those most affected, while also co-creating actionable steps that aim to address barriers that historically have prevented patients from accessing health care. To learn about RHC and its ongoing efforts to improve access, visit <http://www.stlrhc.org>.

“This is as close to the fabled unicorn of datasets that a local public health agency could access.”

— Kelley K. Vollmer, Director of the Jefferson County Health Department

Figure 1: Missouri ZIP Health Rankings Compared to the Robert Wood Johnson Foundation's County Health Rankings



2016-2018 Missouri ZIP Health Ranking Results

The updated 2016-2018 ZHR data are based on more than 40 million inpatient, outpatient and emergency department claims for Missouri residents with discharge dates between Oct. 1, 2015, and Sept. 30, 2018. In addition to hospital claims data, the updated ZHR data draw from five-year estimates from the 2017 American Community Survey of the U.S. Census Bureau.^v The claims data were scanned for arrays of diagnostic and other administrative codes to identify instances of included health factors

and health outcomes, calculated as rates of the population of each ZIP code denominated by ACS data, standardized and used in regression-weighted principal components analysis to derive index scores for each domain and subdomain as described above.

Figure 1 includes maps of health factor and health outcome quintiles and ranks from the 2018 CHR data^{vi} compared to the 2016-2018 ZHR data at both the county and ZIP code levels. The ZIP code-level results were reapportioned to the county level using MABLE GeoCorr to compare the ZHR results

with the 2018 CHR data.^{vii} Across all 114 Missouri counties and City of St. Louis, the health factors domain of the two rankings systems shared a Pearson's correlation coefficient of 0.805, with 65 percent of the variance in the ZIP-derived scores being explained by the CHR scores. For health outcomes, the correlation was 0.831 with an R^2 value of 0.69 (Figure 2).

Evaluating agreement across quintiles between the ZHR and CHR measures resulted in 47 percent of Missouri counties falling in the same quintile for the health factors domain, and 86 percent were within one quintile

Figure 2: County-Level Agreement Between 2018 County Health Rankings and 2016-2018 Missouri ZIP Health Rankings

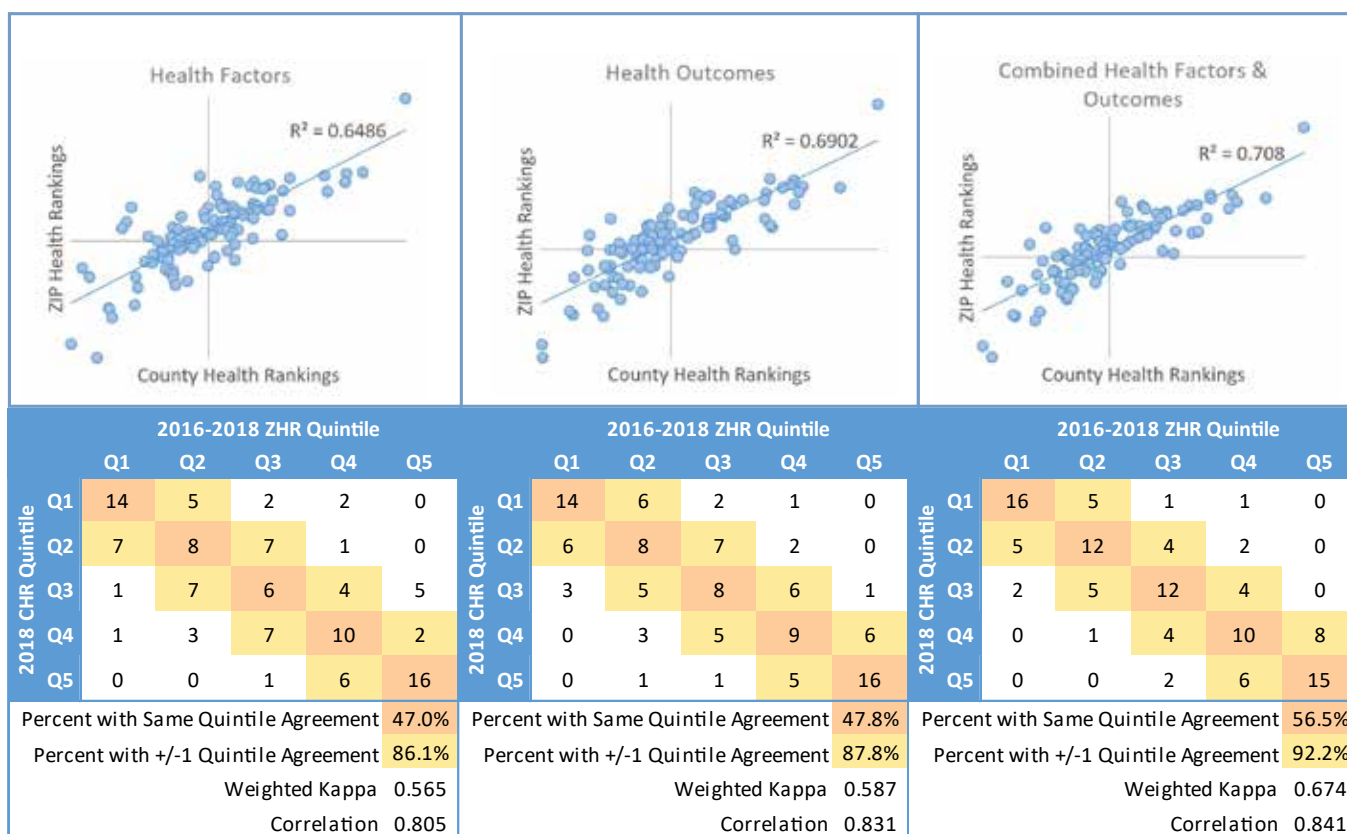
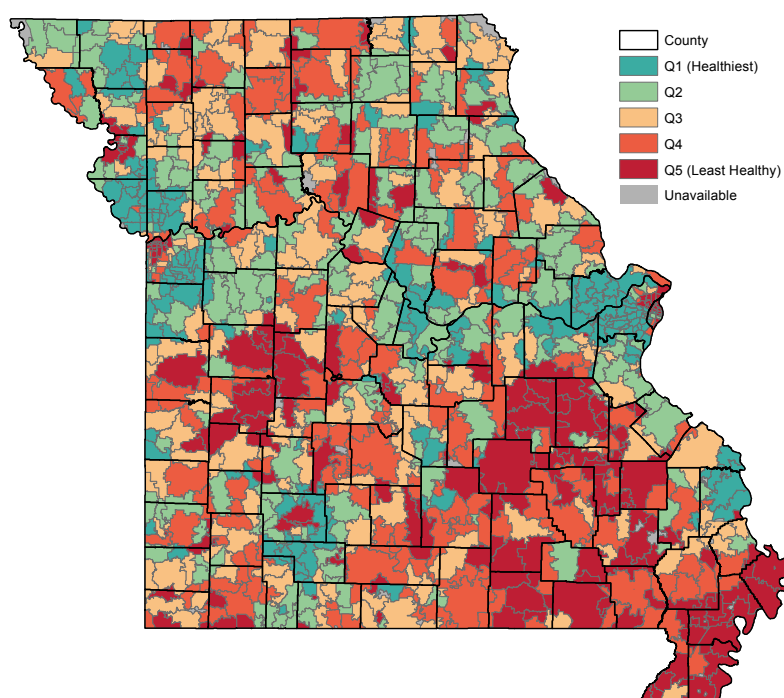


Figure 3: 2016-2018 Overall Missouri ZIP Health Rankings, Combined Health Factors and Health Outcomes



in each measurement construct.

For the health outcomes domain, 47.8 percent of counties were in the same quintile, according to both the CHR and ZHR measures, while 87.8 percent were within one quintile (Figure 2).

Overall health rankings were calculated with the mean index scores of the health factors and health outcomes domains. The combined rankings featured the strongest agreement and linear association between the 2018 CHR and reapportioned 2016-2018 ZHR data, with a correlation coefficient of 0.841, 56.5 percent of counties being ranked in the same quintile and 92.2 percent ranked within one quintile (Figure 2). Figure 3 shows the overall ZIP health rankings for 2016-2018 distributed by quintiles for 940 Missouri ZIP codes with sufficient data during the study period.

Table 1: Top- and Bottom-Five Ranked ZIP Codes in Missouri: 2016-2018 ZIP Health Rankings

ZIP Code and County	Health Factors	Health Outcomes	Overall
63124, Ladue in St. Louis Co.	1	1	1
63005, Chesterfield in St. Louis Co.	2	2	2
63131, Des Peres in St. Louis Co.	3	3	3
64165, KC-Woodland Creek in Jackson Co.	4	4	4
63105, Clayton in St. Louis Co.	5	5	5
64128, KC-Palestine East in Jackson Co.	936	936	936
64120, KC-Northeast Industrial in Jackson Co.	938	933	937
64127, KC-Washington-Weatley in Jackson Co.	939	938	938
64125, KC-Sheffield in Jackson Co.	940	939	939
63955, Oxly in Ripley Co.	937	940	940

Conclusion

Location has a profound influence on health. The ability to examine targeted health data for a specific county, and the ZIP codes included therein, enables health care providers and other community stakeholders to identify issues and take action to help create and sustain a healthier Missouri. [exploreMOhealth](#) is designed to facilitate the exploration of unique hyperlocal health data for a better understanding of the factors influencing outcomes across Missouri communities. Table 1 includes the five most- and least-healthy ZIP codes identified in the latest Missouri ZIP Health Rankings. For more insights into the health factors and health outcomes driving the results for these, and all ZIP codes in Missouri, visit [exploreMOhealth.org](#). Questions, comments and feedback on the site or data are welcome at exploreMOhealth@mhanet.com.

Acknowledgements

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