Miles Away, Worlds Apart: Assessing Community Health Needs with exploreMOhealth.org

exploreMOhealth

County Health Rankings & Roadmaps
Building a Culture of Health, County by County

A Robert Wood Johnson Foundation program

The exploreMOhealth community health needs assessment platform was updated and relaunched May 31, 2022. The Missouri ZIP Health Rankings data included on the site were updated to reflect the most recent information on the health and social well-being of populations living in 937 Missouri ZIP codes. The latest ZHR data were generated by Missouri hospitals between fiscal years 2019 and 2021, and by the 2020 American Community Survey of the U.S. Census Bureau.

In addition to updating the ZIP code-level data, new county-level data from the Robert Wood Johnson Foundation's 2021 County Health Rankings & Roadmaps program now are available on exploreMOhealth, in addition to the Missouri Foundation for Health's 2016 Missouri County-Level Study data.

Combining both health factors and outcomes, Missouri's healthiest ZIP code during the 2019-2021 study period was 63124 — the city of Ladue in St. Louis County with a population of 11,107. At the opposite end of the distribution, ranked 937th was 63955, the census-designated place of Oxly, Mo., in southeastern Ripley County with a population of only 106. The new data for Missouri's 114 counties and St. Louis City, in addition to 937 ZIP codes with sufficient information, now are available on exploreMOhealth.org.

BACKGROUND:

The places where we live, work, learn and play affect our health. Examples throughout this brief show that communities separated by a distance of a few miles, 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 across and within Missouri counties is a powerful strategy for optimizing the allocation of scarce resources to maximize the effectiveness of community health improvement efforts.

The traditional delivery of health care is moving beyond just treatment within the walls of hospitals and into managing the health of populations in the community. Health care providers are beginning to increase their focus on upstream social determinants of health that often lead to poor health outcomes. This shift is being driven in part by new regulations that require hospitals to work with public health experts, such as local public health agencies, to develop community health needs assessments and improvement plans to maintain their not-for-profit status. These factors are expediting the collaborative delivery of care across
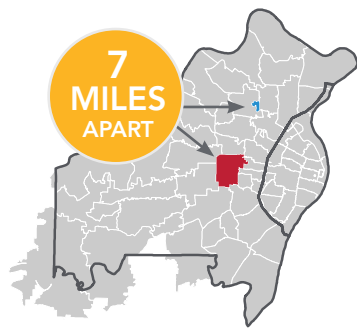
63124 Ladue

63140 Kinloch

Seven Miles Away, Worlds Apart in St. Louis

7 MILES APART

	63124 Ladue	63140 Kinloch	Disparity Factor
Overall ZIP Health Ranking out of 937	1	920	920x
Childhood Poverty	3%	100%	37.8x
Medicaid Hospital Visits per 1,000	13.23	491.59	37.1x
Age 25+ With Less Than High School Education	1%	21%	19.1x
Assault Hospital Visits per 1,000	0.93	16.82	18.1x
Dental Caries per 1,000	0.87	8.90	10.2x
Premature Hospital Deaths (Before Age 75) per 1,000	0.81	3.96	4.9x
Opioid Use Hospital Visits per 1,000	9.93	39.56	4x

The platform is 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 continuum — integrating voices from public health, social service and community action organizations. It is critical that these collaborative efforts are founded on insightful, firm data that identify areas of need within different populations and across geographic locations.

In March 2018, the Missouri Hospital Association and Missouri Foundation for Health released exploreMOhealth, a CHNA platform developed through a partnership with the University of Missouri's Center for Applied Research and Engagement Systems.[1] The platform is 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.

Through a partnership with the Robert Wood Johnson Foundation's County Health Rankings & Roadmaps program and the University of Wisconsin Population Health Institute, the exploreMOhealth platform also offers 2021 CHR data for Missouri's 114 counties and St. Louis City.

Since its launch, exploreMOhealth has been queried more than 34,000 times by 20,000 individual users, resulting in nearly 89,000 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.
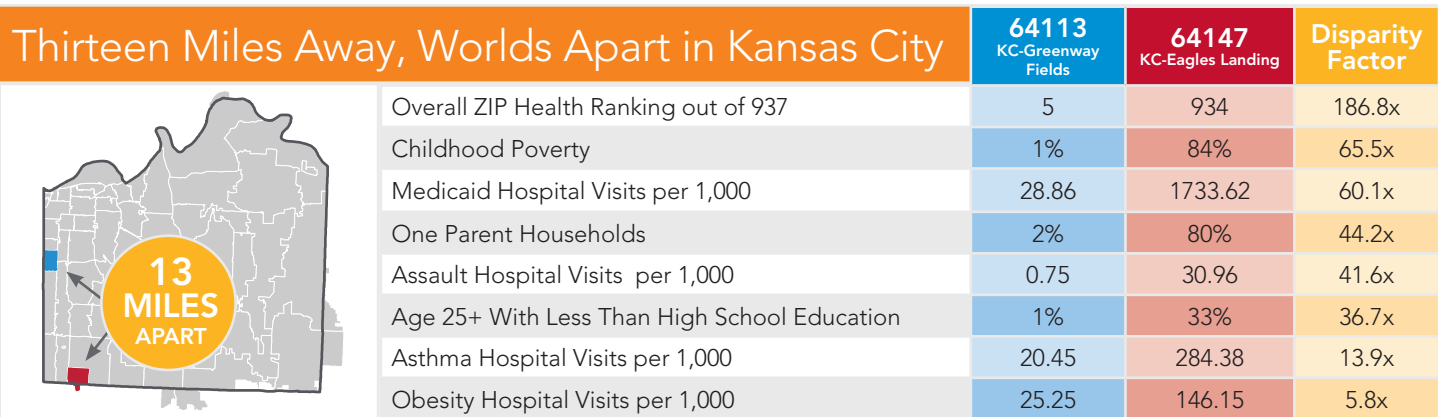
Thirteen Miles Away, Worlds Apart in Kansas City

	64113 KC-Greenway Fields	64147 KC-Eagles Landing	Disparity Factor
Overall ZIP Health Ranking out of 937	5	934	186.8x
Childhood Poverty	1%	84%	65.5x
Medicaid Hospital Visits per 1,000	28.86	1733.62	60.1x
One Parent Households	2%	80%	44.2x
Assault Hospital Visits per 1,000	0.75	30.96	41.6x
Age 25+ With Less Than High School Education	1%	33%	36.7x
Asthma Hospital Visits per 1,000	20.45	284.38	13.9x
Obesity Hospital Visits per 1,000	25.25	146.15	5.8x

13 MILES APART

Table 1: Data Domains and Subdomains Available on exploreMOhealth by Source

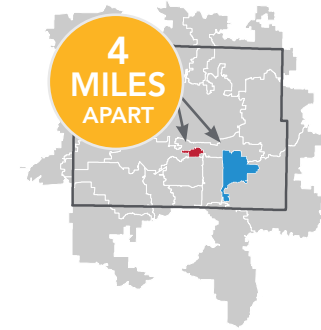|	ZIP HEALTH RANKINGS	COUNTY HEALTH RANKINGS	COUNTY-LEVEL STUDY	ACS & OTHER NATIONAL
Health Rankings	X	X		
Health Factors	X	X	X	
Behaviors	X	X	X	
Clinical Care & Access	X	X	X	
Environment	X	X	X	
Socioeconomic Status	X	X		X
Health Outcomes	X	X	X	
Quality of Life (Morbidity)	X	X	X	
Length of Life (Mortality)	X	X		
Demographic				X

ABOUT THE DATA:

The Missouri ZIP Health Rankings are designed to assist hospitals and community health stakeholders with identifying 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, the 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 CHR model of population health.[2] The project was funded by the RWJF through a 2015 County Health Rankings Research Grant award. The research team was guided by advisory committee members from academia, local public health, 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.[3]

The methodological approach for the 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 consists of four subdomains, including health behaviors, socioeconomic status, clinical care and environmental factors.

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 reidentification risk assessment and top-coded (i.e., winsorized) if tolerance thresholds are exceeded. Principal components

Four Miles Away, Worlds Apart in Springfield	65809 SE Springfield	65806 Downtown	Disparity Factor
Overall ZIP Health Ranking out of 937	33	862	26.1x
Childhood Poverty	2%	43%	28.7x
Age 25+ Less Than High School Education	1%	15%	10.1x
Assault Hospital Visits per 1,000	0.94	8.49	9x
Dental Caries per 1,000	1.13	5.73	5.1x
Teen Pregnancy Hospital Visits per 1,000	3.49	14.50	4.2x
Low Birthweight per 1,000	18.75	74.44	4x
Unemployment	2%	6%	3.9x

4 MILES APART

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.
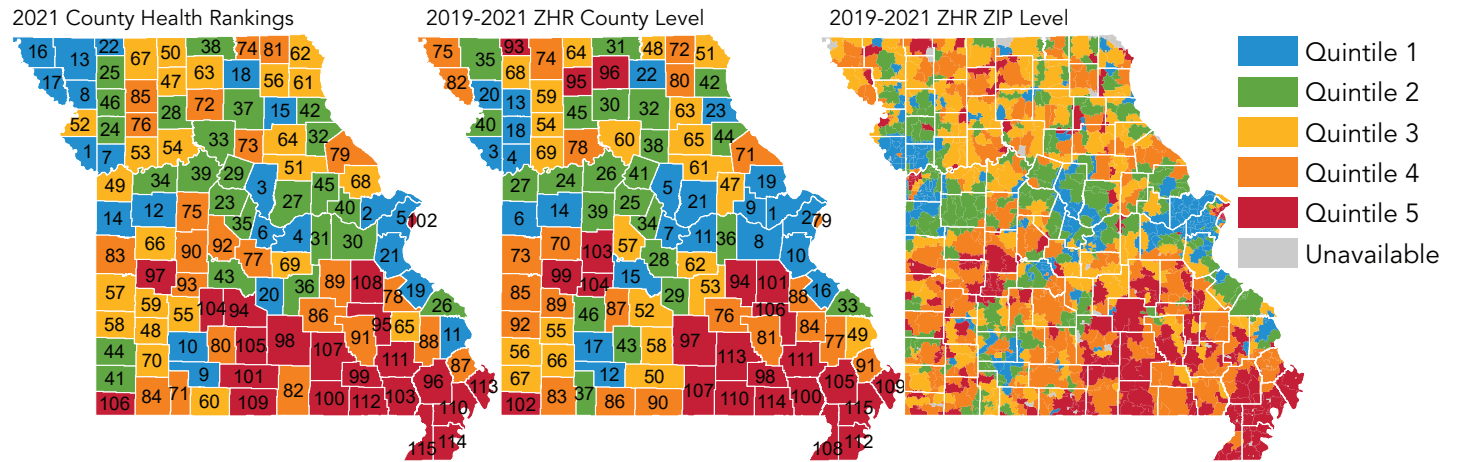
The County Health Rankings & Roadmaps program is a collaboration between the RWJF and the University of Wisconsin Population Health Institute. CHR&R provides data, evidence, guidance and examples to build awareness of the multiple factors that influence health and connect community leaders working to improve health and equity. The annual CHR measure vital health factors, including high school graduation rates, obesity, smoking, unemployment, access to healthy foods, the quality of air and water, income inequality, and teen births in nearly every U.S. county. They also provide a revealing snapshot of how health is influenced by where we live, learn, work and play. CHR&R offers many pathways for self-directed and peer learning, web-based content, and virtual interactive forums that are designed to accelerate learning and action in communities to help build healthier communities and advance equity.

The Missouri County-Level Study is a periodic survey of the health-related behaviors and attitudes of Missourians ages 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.[4]

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 Care 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.

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

Health Factors

2021 County Health Rankings | 2019-2021 ZHR County Level | 2019-2021 ZHR ZIP Level

	Color
Quintile 1	(blue)
Quintile 2	(green)
Quintile 3	(yellow)
Quintile 4	(orange)
Quintile 5	(red)
Unavailable	(gray)

Health Outcomes

2021 County Health Rankings | 2019-2021 ZHR County Level | 2019-2021 ZHR ZIP Level
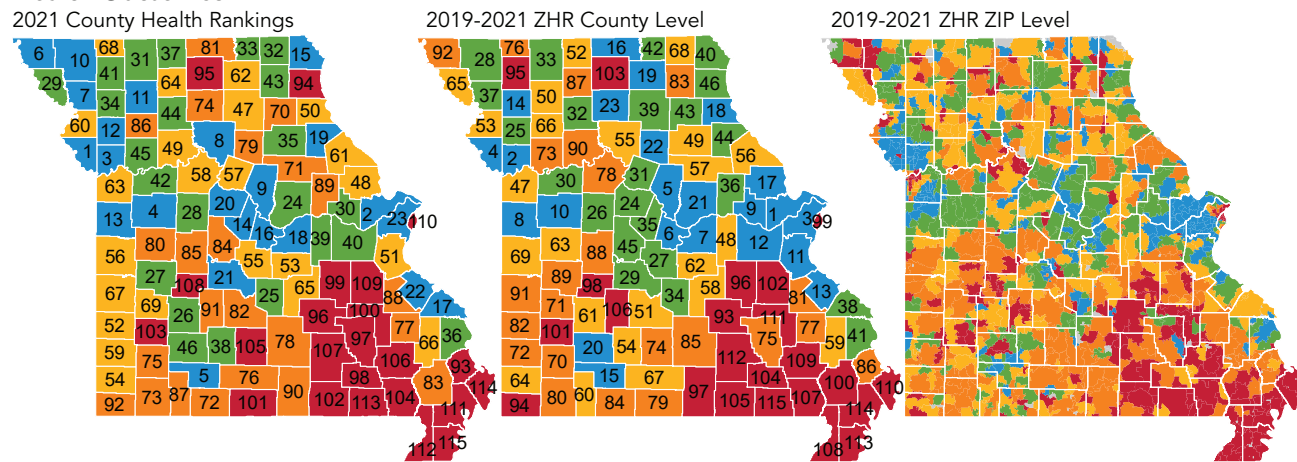
The information gathered from residents of all 114 Missouri counties and St. Louis City is intended to assist community health stakeholders and researchers with identifying variation in health priorities and correlates at the county level. The study is funded by MFH and conducted in collaboration with the Missouri Department of Health and Senior Services.

Demographic and Socioeconomic data from the U.S. Census Bureau's American Community Survey and other national sources also are available to assist users in characterizing the populations of Missouri counties and ZIP codes.

2019-2021 MISSOURI ZIP HEALTH RANKING RESULTS:

The updated 2019-2021 ZHR data are based on more than 40 million inpatient, outpatient and emergency department claims for Missouri residents with discharge dates between Oct. 1, 2018, and Sept. 30, 2021. In addition to hospital claims data, the updated ZHR data draw from five-year estimates from the 2020 American Community Survey of the U.S. Census Bureau.[5]

Figure 2: County-Level Agreement Between 2021 County Health Rankings and 2019-2021 Missouri ZIP Health Rankings

Health Factors ($R^2 = 0.6902$)

2021 CHR Quint	Q1	Q2	Q3	Q4	Q5
Q1	15	2	2	2	1
Q2	7	11	6		
Q3	1	4	8	9	2
Q4		6	4	9	4
Q5			3	3	16

Percent with Same Quintile Agreement	51.3%
Percent with +/-1 Quintile Agreement	85.2%
Weighted Kappa	0.578
Correlation	0.831

Health Outcomes ($R^2 = 0.6365$)

2021 CHR Quint	Q1	Q2	Q3	Q4	Q5
Q1	11	9	2	1	
Q2	5	7	7	3	1
Q3	4	3	8	8	
Q4	3	3	6	7	4
Q5		1		4	18

Percent with Same Quintile Agreement	44.4%
Percent with +/-1 Quintile Agreement	84.4%
Weighted Kappa	0.522
Correlation	0.678

Combined Health Factors & Outcomes ($R^2 = 0.7199$)

2021 CHR Quint	Q1	Q2	Q3	Q4	Q5
Q1	14	7	1	1	
Q2	8	6	5	4	
Q3	1	6	8	8	
Q4		4	7	6	6
Q5			2	4	17

Percent with Same Quintile Agreement	44.3%
Percent with +/-1 Quintile Agreement	88.7%
Weighted Kappa	0.576
Correlation	0.848

CHR&R provides data, evidence, guidance and examples to build awareness of the multiple factors that influence health and connect community leaders working to improve health and equity.

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 analyses 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 2021 CHR data[6] compared to the 2019-2021 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 2021 CHR data.[7] Across all 114 Missouri counties and St. Louis City, the health factors domain of the two rankings systems shared a Pearson's correlation coefficient of 0.83, with 69.0% of the variance in the ZIP code-derived scores being explained by the CHR scores. For health outcomes, the correlation was 0.68 with an R^2 value of 0.64 (Figure 2).

Evaluating agreement across quintiles between the ZHR and CHR measures resulted in 51% of Missouri counties falling in the same quintile for the health factors domain, and 85% were within one quintile in each measurement construct. For the health outcomes domain, 44% of counties were in the same quintile according to both the CHR and ZHR measures, while 84% were within one quintile (Figure 2).
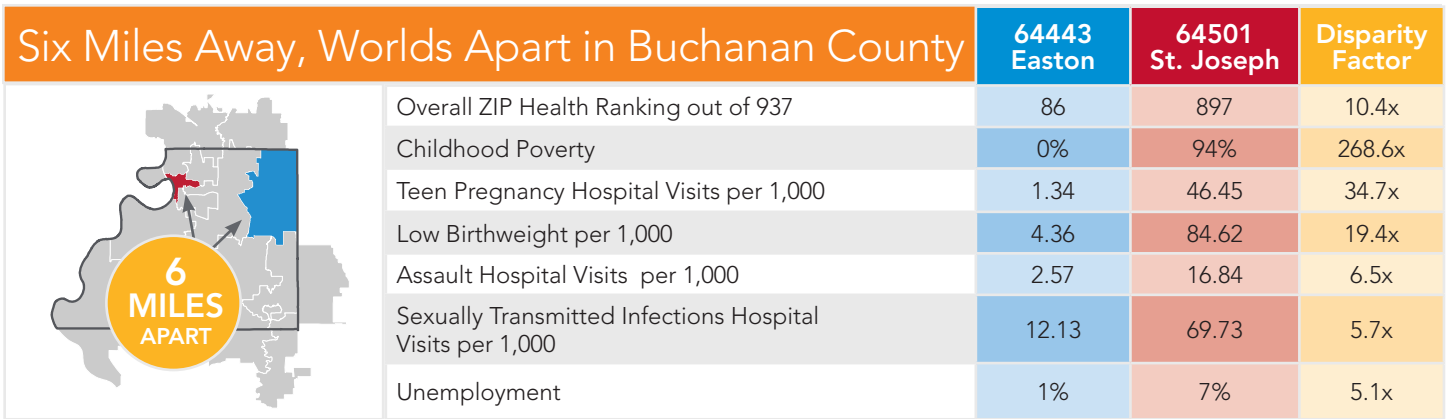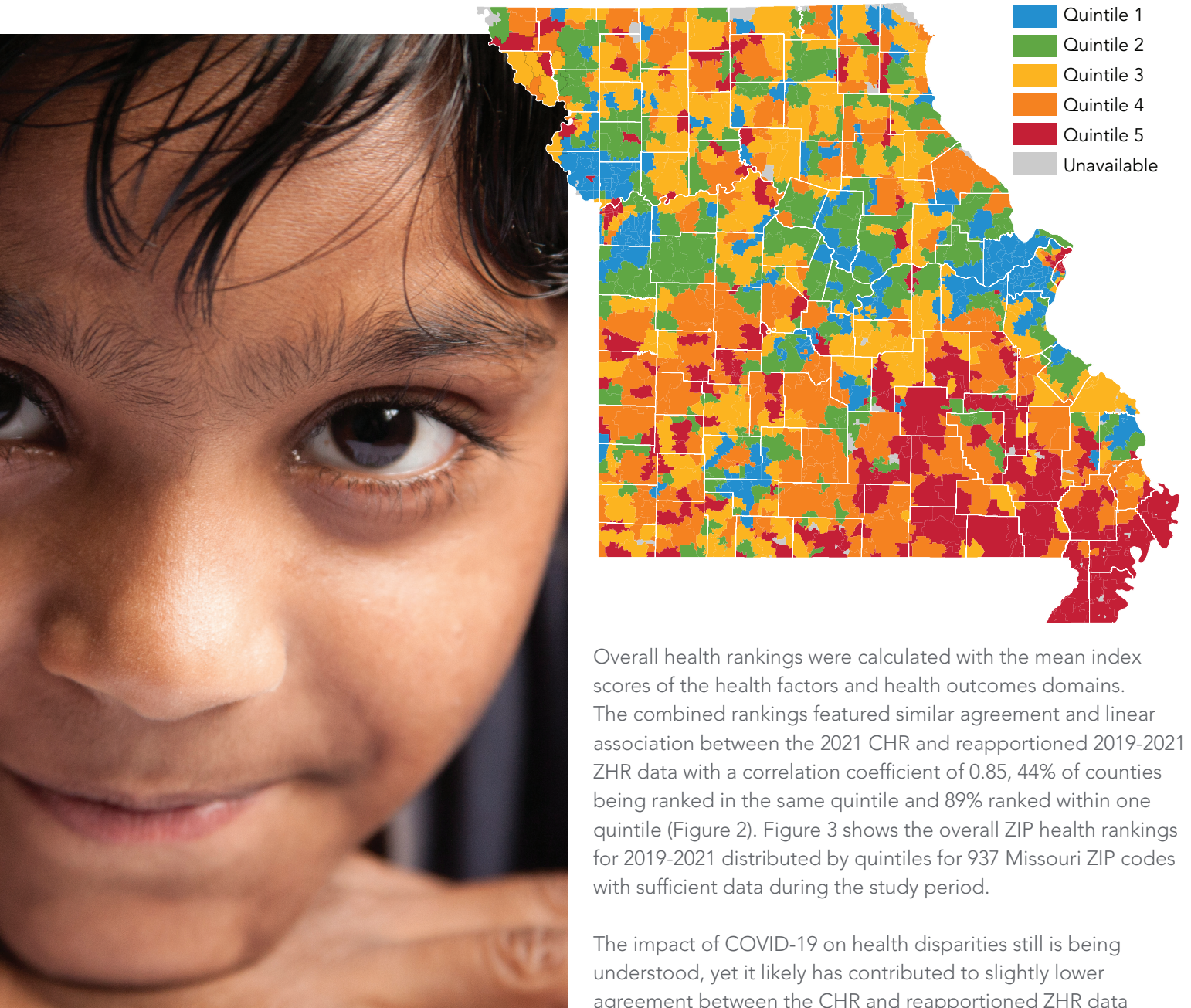
Six Miles Away, Worlds Apart in Buchanan County	64443 Easton	64501 St. Joseph	Disparity Factor
Overall ZIP Health Ranking out of 937	86	897	10.4x
Childhood Poverty	0%	94%	268.6x
Teen Pregnancy Hospital Visits per 1,000	1.34	46.45	34.7x
Low Birthweight per 1,000	4.36	84.62	19.4x
Assault Hospital Visits per 1,000	2.57	16.84	6.5x
Sexually Transmitted Infections Hospital Visits per 1,000	12.13	69.73	5.7x
Unemployment	1%	7%	5.1x

6 MILES APART

Figure 3: 2019-2021 Overall Missouri ZIP Health Rankings, Combined Health Factors and Health Outcomes

Quintile 1
Quintile 2
Quintile 3
Quintile 4
Quintile 5
Unavailable

Overall health rankings were calculated with the mean index scores of the health factors and health outcomes domains. The combined rankings featured similar agreement and linear association between the 2021 CHR and reapportioned 2019-2021 ZHR data with a correlation coefficient of 0.85, 44% of counties being ranked in the same quintile and 89% ranked within one quintile (Figure 2). Figure 3 shows the overall ZIP health rankings for 2019-2021 distributed by quintiles for 937 Missouri ZIP codes with sufficient data during the study period.

The impact of COVID-19 on health disparities still is being understood, yet it likely has contributed to slightly lower agreement between the CHR and reapportioned ZHR data

ZIP Code	County	Top Health Factor (+/- Standard Deviations from State Average)	Top Social Factor (+/- Standard Deviations from State Average)	Rank out of 937
63124 Ladue	St. Louis	70 Male Genital Cancer Hospital Visits per 1,000 (0.79)	10% Multilingual Households (0.84)	1
63073 Saint Albans	Franklin	253 Male Genital Cancer Hospital Visits per 1,000 (6.4)	306 Individuals Commuting Greater than 30 Min to Work per 1,000 (1.9)	2
63131 Des Peres	St. Louis	66 Male Genital Cancer Hospital Visits per 1,000 (0.68)	9% Multilingual Households (0.71)	3
63005 Chesterfield	St. Louis	111 Breast Cancer Hospital Visits per 1,000 (0.37)	15% Multilingual Households (1.6)	4
64113 KC Greenway Fields	Jackson	123 Breast Cancer Hospital Visits per 1,000 (0.58)	434 Individuals Commuting Alone to Work per 1,000 (0.98)	5
63964 Silva	Wayne	74 Stroke Hospital Visits per 1,000 (3.9)	68% Unemployment (10)	933
64147 SW Kansas City	Jackson	284 Asthma Hospital Visits per 1,000 (7.3)	80% Female Headed Households with Children (10)	934
63560 Pollock	Sullivan	169 Lymphoma Cancer per 1,000 (4.3)	100% Childhood Poverty (4.5)	935
65479 Hartshorn	Texas	14 Urinary Tract Infection Admissions per 1,000 (10)	53% Adults Age 25+ with Less than High School Education (5.1)	936
63955 Oxly	Ripley	544 Inpatient Visits per 1,000 (10)	54% Unemployment (9.1)	937

this year compared with prior years, particularly for the health outcomes rankings with 10%-15% lower agreement. The 2021 CHR health outcome measures (e.g., premature death) are derived from 2017-2019 data, while the analogous 2019-2021 ZHR health outcomes measures include two years during the COVID-19 pandemic from 2019-2021. Despite slightly lower agreement this year, the correlation between this year's and last year's ZHR are high (correlation coefficients>0.89), suggesting minimal impact on end users.

CONCLUSION:

Location has a profound impact on health. The ability to examine targeted health data for a specific county, and the ZIP codes contained 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 2 includes the five most- and least-healthy ZIP codes identified in the latest Missouri ZHR. 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.

REFERENCES:

[1] Hughes, B. & Kuhn, H. (2018, March 21). exploreMOhealth.org brings the data to address disparities. *The St. Louis American*. Retrieved from http://www.stlamerican.com/your_health_matters/health_news/exploremohealth-org-brings-the-data-to-address-disparities/article_f8d67adc-2d44-11e8-98ad-df935576a0a3.html

[2] County Health Rankings & Roadmaps. University of Wisconsin Population Health Institute. Robert Wood Johnson Foundation. (n.d.). Our Methods. Retrieved from http://www.countyhealthrankings.org/explore-health-rankings/our-methods

[3] Nagasako, E., Waterman, B., Reidhead, M., Lian, M. & Gehlert, S. (2018). Measuring Subcounty differences in population health using hospital and census-derived data sets: The Missouri ZIP Health Rankings Project. *The Journal of Public Health Management and Practice, 24*(4) 340-349. Retrieved from https://journals.lww.com/jphmp/Fulltext/2018/07000/Measuring_Subcounty_Differences_in_Population.8.aspx

[4] Missouri Department of Health and Senior Services. (n.d.). County-Level Study Design & Methodology. Retrieved from https://health.mo.gov/data/cls/designmethodology.php

[5] United States Census Bureau. (2022, April). 2020 American Community Survey. Retrieved from https://www.census.gov/programs-surveys/acs

[6] County Health Rankings & Roadmaps. University of Wisconsin Population Health Institute. Robert Wood Johnson Foundation. (n.d.). 2021 Data for Missouri. Retrieved from https://www.countyhealthrankings.org/app/missouri/2021/overview

[7] Missouri Census Data Center. (2018, December). Geocorr 2018: Geographic Correspondence Engine. Retrieved from https://mcdc.missouri.edu/applications/geocorr2018.html

[8] St. Louis Regional Health Commission. (2018, June). *Geography Matters: The Impact of Regionality on Safety Net Access Trends in St. Louis*. Retrieved from https://1s4g6c1ylxer1li24cn557f1-wpengine.netdna-ssl.com/wp-content/uploads/sites/63/2020/03/Issue-Brief.pdf

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