HIDI HealthStats

Statistics and Analysis From the Hospital Industry Data Institute

County Health Rankings & Roadmaps

Building a Culture of Health, County by County

A Robert Wood Johnson Foundation program

Miles Away, Worlds Apart: Assessing Community Health Needs With exploreMOhealth.org
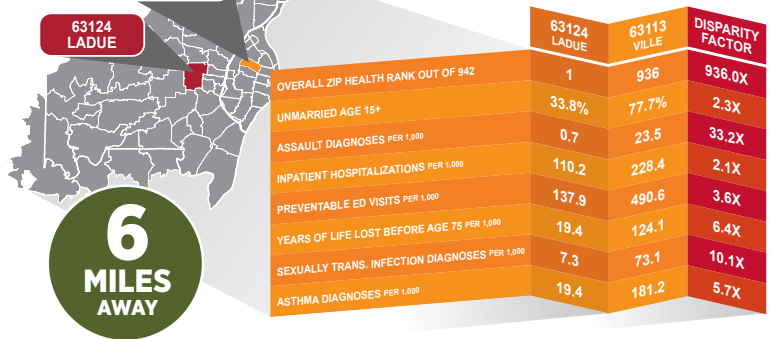
In celebration of National Public Health Week 2020, the exploreMOhealth community health needs assessment platform was updated and relaunched on April 6. The Missouri ZIP Health Rankings data included on the site were updated to reflect the most recent information on the health and social well-being of populations living in 942 Missouri ZIP codes. The latest ZHR data were generated by Missouri hospitals between fiscal years 2017 and 2019, and by the 2018 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 2020 County Health Rankings and 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, the state's healthiest ZIP code during the 2017-2019 study period was 63124 in the St. Louis County neighborhood of Ladue. At the opposite end of the distribution — ranked 942nd — was 63866 in the bootheel town of Marston, eight miles southwest of New Madrid. The new data for Missouri's 114 counties and St. Louis City, in addition to 942 ZIP codes with sufficient information, now is available on exploreMOhealth.org.

63124 LADUE | 63113 VILLE

SIX MILES AWAY, WORLDS APART in St. Louis

6 MILES AWAY

	63124 LADUE	63113 VILLE	DISPARITY FACTOR
OVERALL ZIP HEALTH RANK OUT OF 942	1	936	936.0X
UNMARRIED AGE 15+	33.8%	77.7%	2.3X
ASSAULT DIAGNOSES PER 1,000	0.7	23.5	33.2X
INPATIENT HOSPITALIZATIONS PER 1,000	110.2	228.4	2.1X
PREVENTABLE ED VISITS PER 1,000	137.9	490.6	3.6X
YEARS OF LIFE LOST BEFORE AGE 75 PER 1,000	19.4	124.1	6.4X
SEXUALLY TRANS. INFECTION DIAGNOSES PER 1,000	7.3	73.1	10.1X
ASTHMA DIAGNOSES PER 1,000	19.4	181.2	5.7X

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 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

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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 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 community health needs assessment platform developed through a partnership with the University of Missouri's Center for Applied Research and Engagement Systems.[i] The platform is designed to assist community heath 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 new partnership with the Robert Wood Johnson Foundation's County Health Rankings and Roadmaps Program and the University of Wisconsin Population Health Institute, the exploreMOhealth platform now offers the latest CHR data for Missouri's 114 counties and St. Louis City.

Since its launch, exploreMOhealth has been queried 18,500 times by more than 13,000 individual users, resulting in nearly 60,000 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 ZIP Health Rankings are designed to assist hospitals and community health stakeholders identify high-risk communities within counties, and 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 County Health Rankings model of population health. 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, 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*.[iii]
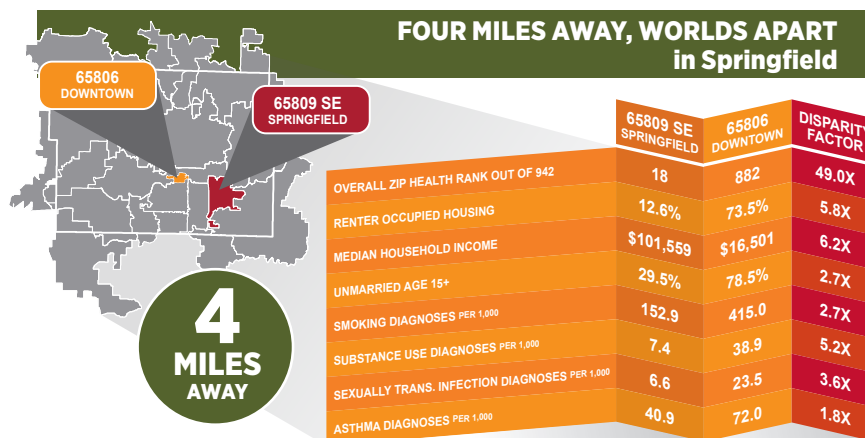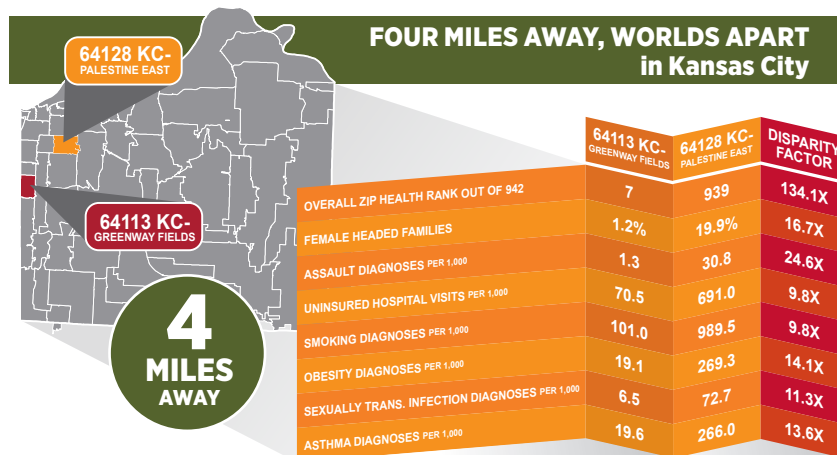
The methodological approach for the ZHR is based on fitting hospital discharge and social factor data to each of the CHR domains and subdomains. The health outcomes domain consists of two subdomains, including quality of life (morbidity) and length of life (mortality). The health factors domain that contributes to differences in morbidity and mortality consist of four subdomains, including health behaviors, social determinants, clinical care and environmental factors.

Table 1: Data Domains and Subdomains Available on exploreMOhealth by Source	ZIP HEALTH RANKINGS	COUNTY HEALTH RANKINGS	COUNTY- LEVEL STUDY	ACS & OTHER NATIONAL SOURCES
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		
Quality of Life (Morbidity)	X	X	X	
Length of Life (Mortality)	X	X	X	
Demographic				X

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 are then 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 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 Robert Wood Johnson Foundation 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&R measure vital health factors, including high school graduation, obesity, smoking, unemployment and teen birth rates; access to healthy foods; the quality of air and water; and income inequality in nearly every U.S. county. The annual rankings 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. To learn more, visit countyhealthrankings.org.

FOUR MILES AWAY, WORLDS APART in Kansas City

	64113 KC-GREENWAY FIELDS	64128 KC-PALESTINE EAST	DISPARITY FACTOR
OVERALL ZIP HEALTH RANK OUT OF 942	7	939	134.1X
FEMALE HEADED FAMILIES	1.2%	19.9%	16.7X
ASSAULT DIAGNOSES PER 1,000	1.3	30.8	24.6X
UNINSURED HOSPITAL VISITS PER 1,000	70.5	691.0	9.8X
SMOKING DIAGNOSES PER 1,000	101.0	989.5	9.8X
OBESITY DIAGNOSES PER 1,000	19.1	269.3	14.1X
SEXUALLY TRANS. INFECTION DIAGNOSES PER 1,000	6.5	72.7	11.3X
ASTHMA DIAGNOSES PER 1,000	19.6	266.0	13.6X

4 MILES AWAY

64128 KC-PALESTINE EAST
64113 KC-GREENWAY FIELDS

FOUR MILES AWAY, WORLDS APART in Springfield

	65809 SE SPRINGFIELD	65806 DOWNTOWN	DISPARITY FACTOR
OVERALL ZIP HEALTH RANK OUT OF 942	18	882	49.0X
RENTER OCCUPIED HOUSING	12.6%	73.5%	5.8X
MEDIAN HOUSEHOLD INCOME	$101,559	$16,501	6.2X
UNMARRIED AGE 15+	29.5%	78.5%	2.7X
SMOKING DIAGNOSES PER 1,000	152.9	415.0	2.7X
SUBSTANCE USE DIAGNOSES PER 1,000	7.4	38.9	5.2X
SEXUALLY TRANS. INFECTION DIAGNOSES PER 1,000	6.6	23.5	3.6X
ASTHMA DIAGNOSES PER 1,000	40.9	72.0	1.8X

4 MILES AWAY

65806 DOWNTOWN
65809 SE SPRINGFIELD

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.[iv]

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 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 Missouri Foundation for Health 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.
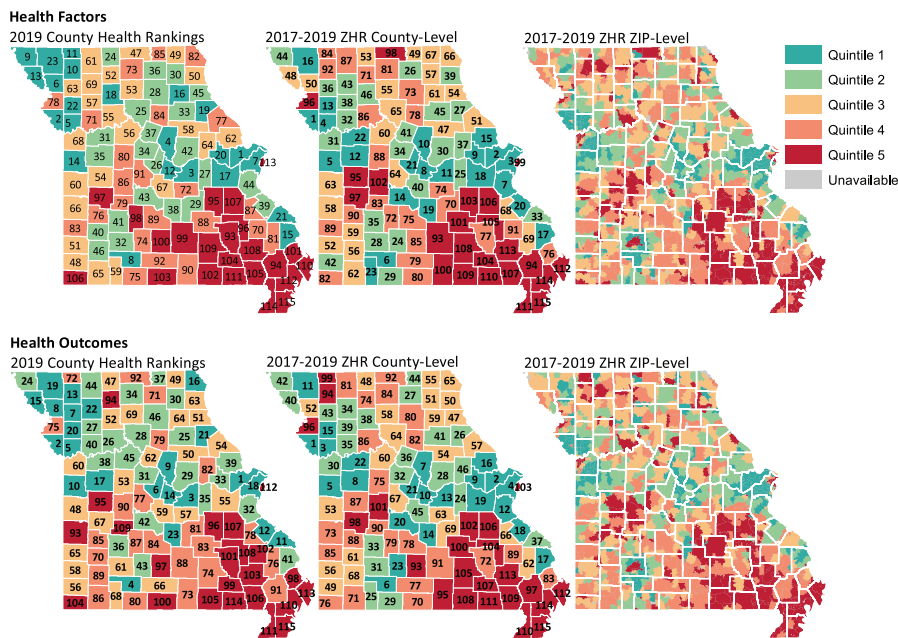
2017-2019 Missouri ZIP Health Ranking Results

The updated 2017-2019 ZHR data are based on more than 40 million inpatient, outpatient and emergency department claims for Missouri residents with discharge dates between Oct. 1, 2016, and Sept. 30, 2019. In addition to hospital claims data, the updated ZHR data draw from

five-year estimates from the 2018 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.
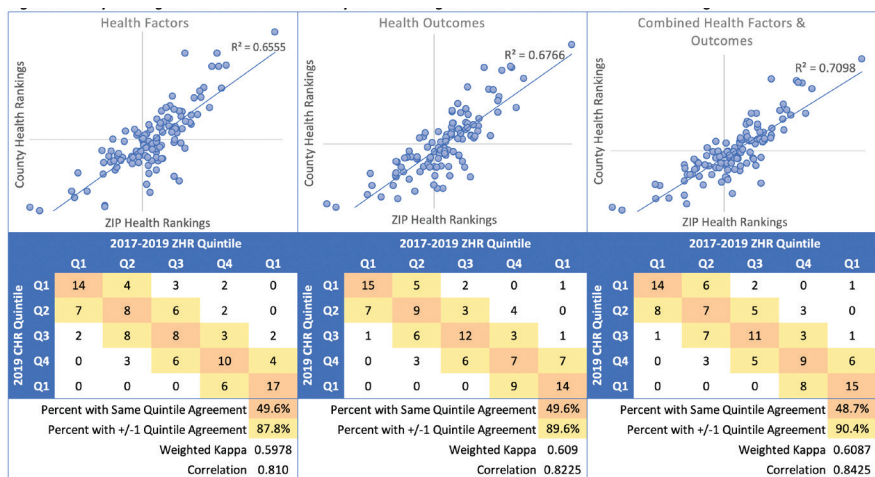
Figure 1 includes maps of health factor and health outcome quintiles and ranks from the 2019 CHR data[vi] compared to the 2017-2019 ZHR data at both the county and ZIP code levels. The ZIP-level results were reapportioned to the county level using MABLE GeoCorr to compare the ZHR results with the 2019 CHR data.[viii] 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 0.81, with 65.5% of the variance in the ZIP-derived scores being explained by the CHR scores. For health outcomes, the correlation was 0.82 with an R2 value of 0.68 (Figure 2).

Evaluating agreement across quintiles between the ZHR and CHR measures resulted in 50% of Missouri counties falling in the same quintile for the health factors domain, and 89% were within one quintile in each measurement construct. For the health outcomes domain, 50% of counties were in the same quintile according to both the CHR and ZHR measures, while 90% 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 2019 CHR and reapportioned 2017-2019 ZHR data with a correlation coefficient of 0.84, 49% of counties being ranked in the same quintile and 90% ranked within one quintile (Figure 2). Figure 3 shows the overall ZHR for 2017-2019 distributed by quintiles for 942 Missouri ZIP codes with sufficient data during the study period.
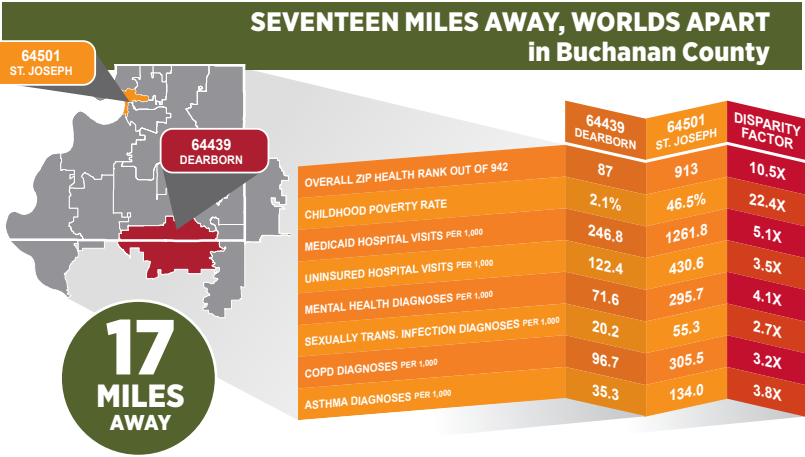
Figure 1: Missouri ZIP Health Rankings Compared to the Robert Wood Johnson Foundation's County Health Rankings

Health Factors
2019 County Health Rankings | 2017-2019 ZHR County-Level | 2017-2019 ZHR ZIP-Level

Health Outcomes
2019 County Health Rankings | 2017-2019 ZHR County-Level | 2017-2019 ZHR ZIP-Level

Quintile 1
Quintile 2
Quintile 3
Quintile 4
Quintile 5
Unavailable

Figure 2: County-Level Agreement Between 2019 County Health Rankings and 2017-2019 Missouri ZIP Health Rankings

Health Factors — R² = 0.6555

2017-2019 ZHR Quintile					
2019 CHR Quintile	Q1	Q2	Q3	Q4	Q1
Q1	14	4	3	2	0
Q2	7	8	6	2	0
Q3	2	8	8	3	2
Q4	0	3	6	10	4
Q1	0	0	0	6	17
Percent with Same Quintile Agreement					49.6%
Percent with +/-1 Quintile Agreement					87.8%
Weighted Kappa					0.5978
Correlation					0.810

Health Outcomes — R² = 0.6766

2017-2019 ZHR Quintile					
2019 CHR Quintile	Q1	Q2	Q3	Q4	Q1
Q1	15	5	2	0	1
Q2	7	9	3	4	0
Q3	1	6	12	3	1
Q4	0	3	6	7	7
Q1	0	0	0	6	14
Percent with Same Quintile Agreement					49.6%
Percent with +/-1 Quintile Agreement					89.6%
Weighted Kappa					0.609
Correlation					0.8225

Combined Health Factors & Outcomes — R² = 0.7098

2017-2019 ZHR Quintile					
2019 CHR Quintile	Q1	Q2	Q3	Q4	Q1
Q1	14	6	2	0	1
Q2	8	7	5	3	0
Q3	1	7	11	3	1
Q4	0	3	5	9	6
Q1	0	0	0	8	15
Percent with Same Quintile Agreement					48.7%
Percent with +/-1 Quintile Agreement					90.4%
Weighted Kappa					0.6087
Correlation					0.8425

SEVENTEEN MILES AWAY, WORLDS APART
in Buchanan County

	64439 DEARBORN	64501 ST. JOSEPH	DISPARITY FACTOR
OVERALL ZIP HEALTH RANK OUT OF 942	87	913	10.5X
CHILDHOOD POVERTY RATE	2.1%	46.5%	22.4X
MEDICAID HOSPITAL VISITS PER 1,000	246.8	1261.8	5.1X
UNINSURED HOSPITAL VISITS PER 1,000	122.4	430.6	3.5X
MENTAL HEALTH DIAGNOSES PER 1,000	71.6	295.7	4.1X
SEXUALLY TRANS. INFECTION DIAGNOSES PER 1,000	20.2	55.3	2.7X
COPD DIAGNOSES PER 1,000	96.7	305.5	3.2X
ASTHMA DIAGNOSES PER 1,000	35.3	134.0	3.8X

17 MILES AWAY

Figure 3: 2017-2019 Overall Missouri ZIP Health Rankings, Combined Health Factors and Health Outcomes

Quintile 1
Quintile 2
Quintile 3
Quintile 4
Quintile 5
Unavailable

Table 2: Top- and Bottom-Five Ranked ZIP Codes: 2017-2019 Missouri ZIP Health Rankings

ZIP Code	County	Top Health Factor (+/- Standard Deviations from State Average)	Top Social Factor (+/- Standard Deviations from State Average)	Rank out of 942
63124 Ladue	St. Louis	259.9 High Risk Mammographies per 1,000 (1.7)	$807,100 Median Home Value (>10)	1
63073 Saint Albans	Franklin	88 Tobacco Use per 1,000 (-1.3)	$217,607 Median Household Income (8.8)	2
63005 Chesterfield	St. Louis	68.41 Inpatient Visits per 1,000 (-1.7)	-6.51 Socioeconomic Deprivation Index (-6.5)	3
63131 Des Peres	St. Louis	278.41 High Risk Mammographies per 1,000 (-2)	$579,000 Median Home Value (-6.7)	4
63105 Clayton	St. Louis	14.29 Obesity per 1,000 (-1.6)	90.0% College Educated (3.0)	5
64125 Kansas City Sheffield	Jackson	32.64 ED Visits for Dental Caries per 1,000 (6.2)	765.5 Uninsured Hospital Visits per 1,000 (6.5)	938
64128 Kansas City Palestine East	Jackson	266.05 Asthma per 1,000 (6.5)	30.82 Assaults per 1,000 (6.0)	939
63955 Oxly	Ripley	363.48 Inpatient Visits per 1,000 (5.8)	38.1% Less than High School Education (3.0)	940
64438 Darlington	Gentry	1,614.68 Diabetes per 1,000 (>10)	853.21 Uninsured Hospital Visits per 1,000 (7.5)	941
63866 Marston	New Madrid	215.16 Opioid Use Disorder per 1,000 (5.3)	31.6% Unemployed (6.2)	942

Conclusions

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 features 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.

References

i   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

ii   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

iii 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. doi: 10.1097/PHH.0000000000000578. Retrieved from http://journals.lww.com/jphmp/Abstract/ publishahead/Measuring_Subcounty_Differences_in_Population.99586.aspx

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

v   United States Census Bureau. 2018 American Community Survey. (n.d.). Retrieved from https://www.census.gov/programs-surveys/acs

vi   County Health Rankings & Roadmaps. University of Wisconsin Population Health Institute. Robert Wood Johnson Foundation. (n.d.). 2019 Data for Missouri. Retrieved from https://www.countyhealthrankings.org/app/missouri/2019/overview

vii Missouri Census Data Center. (2016, September). Geocorr 2014: Geographic Correspondence Engine. Retrieved from http://mcdc.missouri.edu/applications/geocorr2014.html

viii Saint Louis Regional Health Commission. (2018, June). Geography Matters: The Impact of Regionality on Safety Net Access Trends in St. Louis. Retrieved from http://qocri3zgw3918amdk1xadmx1.wpengine.netdna-cdn.com/wp-content/ uploads/2013/07/RHC-1701_Issue-Brief_FNL_REV_R1.pdf