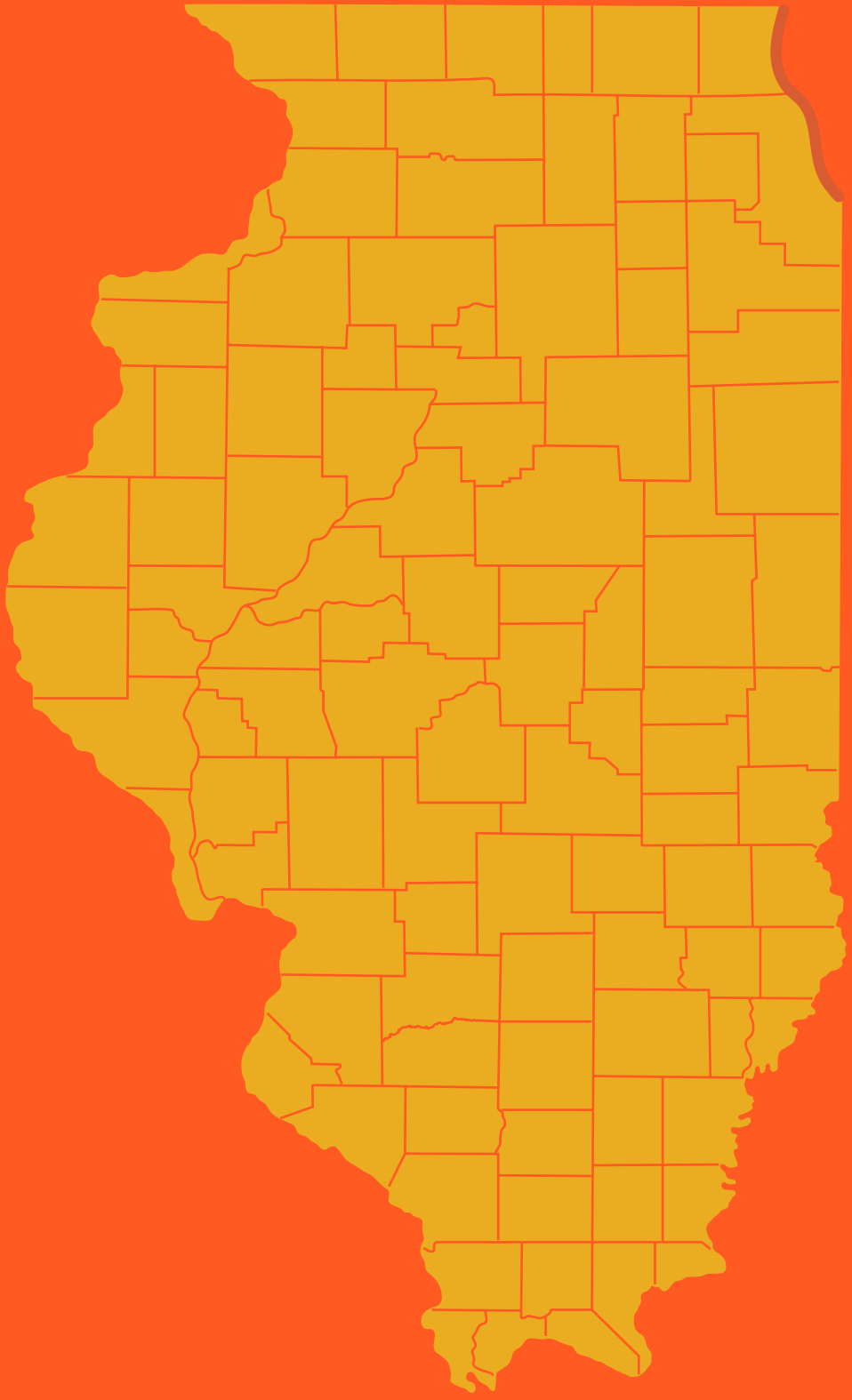

Transformation Data & Community Needs Report

HTC
Healthcare Transformation Collaboratives

MARION HEALTH REGION

October 2022

This report was prepared by the University of Illinois at Chicago (UIC) School of Public Health, Department of Psychology and Institute for Healthcare Delivery Design and Southern Illinois University (SIU) School of Medicine's Center for Rural Health and Social Service Development for the Illinois Department of Healthcare and Family Services. This report details the findings and methods for a study UIC conducted to understand health outcomes and community needs in socially vulnerable areas in the State of Illinois.

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Executive Summary

Healthcare policies enacted during the past decade incentivize healthcare systems receiving public funding to be more accountable for health outcomes in the communities that they serve. These policies are reflected in many forms, including triennial community needs assessments, value-based care models, accountable care organizations, and integrated health home models of care, among others. In spite of these efforts to change the status quo, poor health outcomes and health inequities persist, especially in communities with underlying social vulnerabilities. This reality suggests the need for a new approach.

In recognition of this need, the Illinois Department of Healthcare and Family Services (HFS) in 2019 initiated a healthcare transformation program with the goal of providing healthcare systems and other health-related organizations with financial assistance to transform services and care models to better meet communities' unmet needs. HFS engaged the Institute for Healthcare Delivery Design and the School of Public Health at the University of Illinois at Chicago (UIC) to develop an approach to measure health needs in Illinois communities with high rates of social vulnerability and to use that data to direct transformation funding to reduce existing health disparities and improve the health of Illinoisans. The approach developed by the UIC team combines analysis of Medicaid hospital utilization data for specific areas of the state with input from community members who were primarily, but not exclusively, publicly insured, gathered during in-depth conversations conducted by community-based organization partners to give a fuller picture of communities' wants and needs.

Community input combined with data analysis converged around a set of disease groups and conditions driving hospitalizations, each of them frequent, resource intensive, and contributing to poor health outcomes—and for which hospital-level care can be avoided with outpatient care, coordination of treatment, and community-based supports. These key disease groups and conditions are:

- mental illness, in particular bipolar and depressive disorders
- substance use disorders, especially alcohol and opioid use disorders
- a subset of "ambulatory care sensitive conditions" or ACSCs: hypertensive diseases, diabetes, chronic obstructive pulmonary disease (COPD)/asthma, and heart disease

By definition, ACSCs are health conditions for which either good outpatient care can potentially prevent the need for hospitalization or early intervention can prevent complications and progression to more severe disease. The same can be said for substance use disorders and bipolar and depressive disorders.

Access to quality primary and specialty care is critical to decreasing hospital-level care for ACSCs, mental illnesses and substance use disorders. However, as this report highlights, there's a lack of access to quality care for vulnerable populations. Often, this lack of access is driven by lack of local availability of care and patient-provider relationship

issues as well as social, economic, and other "social-determinant-of-health" barriers that people face in achieving health (for example, poverty, racism, issues with healthcare literacy, etc.) In other words, this is a problem that sits within both the healthcare system and the social fabric of communities.

Creating a middle ground in which hospitals and communities work together to achieve better health outcomes can become the basis for transformation that enables and sustains healthier lives. More specifically, this report's findings suggest that transformation efforts concentrate on building and strengthening linkages between clinical care and community-based needs and services. In other words, transformation should focus on "clinic-community linkages" that provide primary and specialty care plus community-based wraparound services to help people manage chronic illnesses, mental illnesses, and substance use disorders and improve social determinants of health. **Improving health outcomes for these diseases and conditions can be achieved only if social determinants of health are addressed as part of healthcare delivery.**

Clinic-community linkages leverage the treatment expertise of healthcare systems, the on-the-ground knowledge of community-based organizations, and the trust that residents have in those organizations to support a more active approach to chronic disease management. In addition, clinic-community linkages can be a way to restore trust in the healthcare system in socially vulnerable communities and hold the promise of increasing engagement in healthcare over time. If healthcare systems and communities can adopt these new ways of engaging with one another, the current healthcare delivery paradigm will shift from siloed and transactional to relationship-based and collaborative.

The data in this report is intended as a resource for hospitals, legislators, community-based organizations, and other key stakeholders to help them focus, prioritize, and plan efforts to address and more effectively manage the most frequent and resource-intensive diseases and conditions in a culturally competent manner and to produce better, more sustainable health outcomes that are equitable and just.

The UIC research team completed a series of analyses to establish the recommendations in this report as follows:

1: Identified areas in Illinois with the greatest concentration of social vulnerability to health inequities and poor health outcomes

2: Examined the most frequent and resource-intensive diseases driving Medicaid enrollee hospitalizations in 5 of these socially vulnerable areas and discovered a set of disease groups and conditions for which access to quality outpatient care can prevent the need for hospitalization

3: Engaged community members from socially vulnerable areas in conversations and identified barriers to outpatient care, disease prevention, and treatment adherence

4: Synthesized findings from the data analyses and the community conversations to define transformation opportunities for stimulating outpatient care access and reducing the social barriers to care and treatment

Detailed findings from each of these analyses follow, with particular attention on findings for the Marion Health Region.

Detailed Findings

1: Identified areas in Illinois with the greatest concentration of social vulnerability to health inequities and poor health outcomes

The Center for Disease Control's Social Vulnerability Index combines a number of factors such as poverty, lack of access to transportation, and crowded housing into an overall measure of vulnerability by census tract. Areas with higher levels of social vulnerability are more susceptible to health problems. This measure was a key index used in this study to determine the areas of Illinois with the highest levels of social vulnerability, areas susceptible to health inequities.

To identify Illinois areas with high social vulnerability and high susceptibility to health inequities, counties were analyzed individually and, where applicable, in combination, corresponding to Illinois metropolitan and micropolitan statistical areas designated by the U.S. Office of Management and Budget (OMB) (1). Population density, U.S. census-derived indicators of social vulnerability and socioeconomic distress, demographic factors, and history guided the selection of the study areas analyzed for this report. Racially and ethnically diverse population centers are often characterized by marked social and economic contrasts causally associated with health inequities by race and place (2–4). "Place stratification"—in which institutional factors (for example, structural racism) prevent minorities, especially black and brown Americans, from using their socioeconomic means to access communities with greater resources and opportunities—has been implicated in these inequities (5, 6). Significant health gaps also exist between rural and urban residents in Illinois. These include higher rates of smoking and obesity-related health problems, overdose deaths, and being uninsured (7). Decreased spatial accessibility to healthcare providers and services in rural areas only exacerbates vulnerability to the health inequities as a consequence of geography.

Research for this project focused on 9 of the most socially vulnerable areas in Illinois:

- 4 areas within Cook County—the South Side of Chicago, the West Side of Chicago, South Cook County, and West Cook County
- 5 areas outside of Cook County—the Danville Metropolitan Statistical Area (Danville), the East St. Louis Metropolitan Statistical Area (East St. Louis), the Marion Health Region, the Peoria Metropolitan Statistical Area (Peoria), and the Rockford Metropolitan Statistical Area (Rockford)

This report contains data findings from the 5 socially vulnerable areas outside of Cook County (see Figure 1), with particular attention on findings for the Marion Health Regsion, and contains community-input findings from the Marion Health Region.

Figure 1: Study Area Maps with Zip Code Boundaries

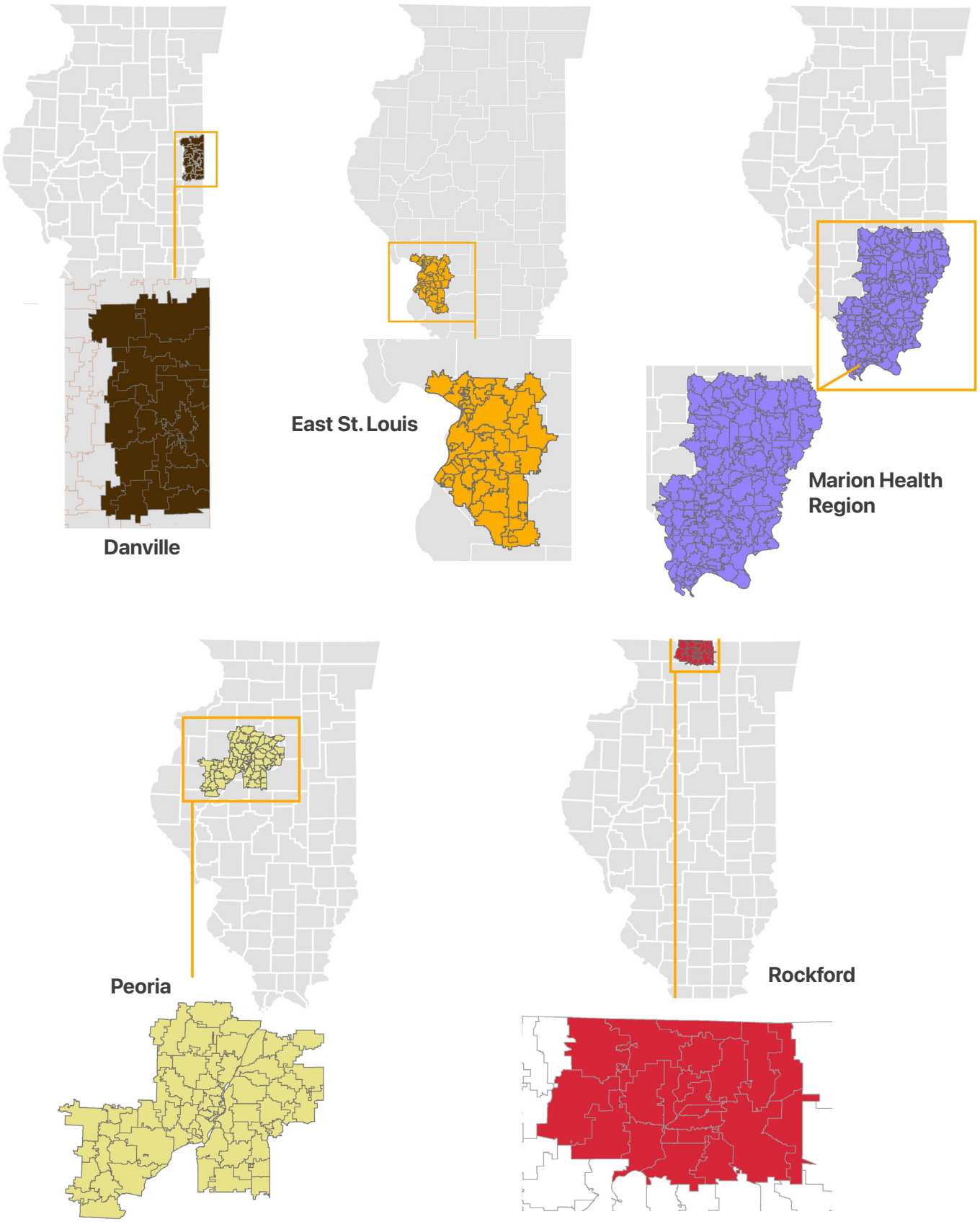


Figure 1 Continued

Danville Zip Codes (24)						
60932	60963	61812	61831	61834	61846	61857
60942	61810	61814	61832	61841	61848	61858
60960	61811	61817	61833	61844	61850	61865
61870	61876	61883				

East St. Louis Zip Codes (55)						
62001	62034	62061	62095	62281	62207	62232
62002	62035	62062	62097	62294	62208	62239
62010	62040	62067	62201	62059	62220	62240
62018	62046	62074	62234	62203	62221	62243
62021	62048	62084	62249	62204	62223	62255
62024	62058	62087	62254	62205	62225	62257
62025	62060	62090	62269	62206	62226	62258
62260	62264	62282	62285	62289	62293	

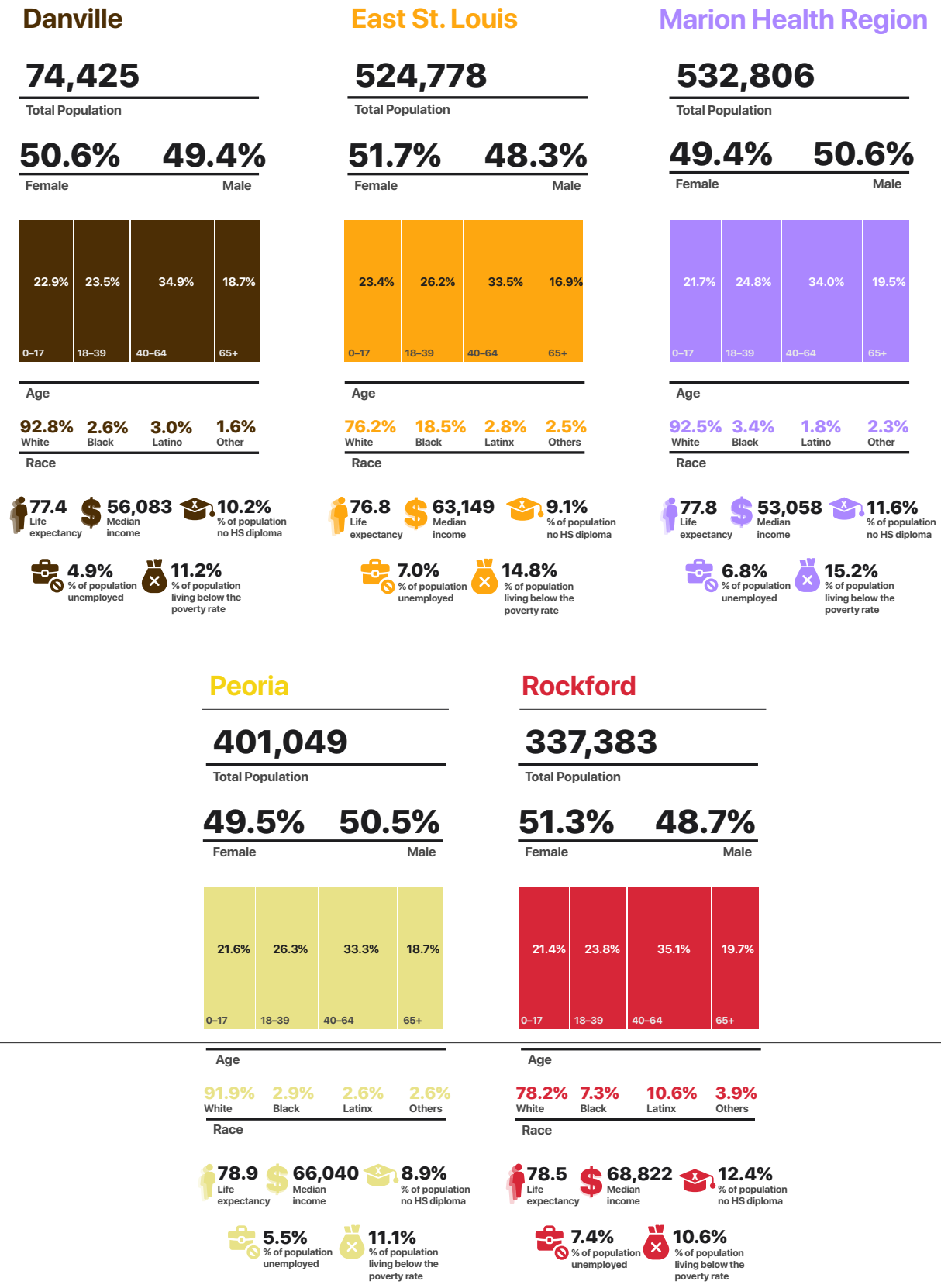
Marion Health Region Zip Codes (199)						
62914	62949	62839	62838	62919	62997	62952
62957	62951	62858	62880	62931	62928	62961
62962	62959	62879	62885	62947	62938	62998
62969	62974	62899	62812	62982	62941	62410
62988	62801	62413	62819	62432	62956	62818
62990	62807	62427	62822	62436	62963	62863
62901	62849	62433	62825	62445	62964	62446
62903	62853	62449	62836	62448	62970	62809
62907	62854	62451	62856	62475	62976	62823
62916	62870	62454	62860	62479	62992	62833
62924	62875	62478	62865	62480	62996	62837
62927	62881	62476	62874	62481	62419	62842
62932	62882	62806	62884	62912	62421	62843
62940	62892	62815	62890	62923	62425	62850
62942	62893	62401	62891	62939	62450	62851
62950	62810	62411	62896	62943	62452	62878
62958	62814	62424	62897	62967	62868	62886
62966	62816	62426	62983	62972	62917	62895
62975	62830	62443	62999	62985	62930	62820
62994	62846	62461	62867	62995	62935	62821
62841	62864	62467	62871	62417	62946	62827
62902	62872	62473	62934	62439	62965	62835
62915	62883	62011	62954	62460	62977	62844
62918	62889	62080	62979	62466	62987	62861
62921	62894	62414	62984	62238	62905	62862
62922	62898	62418	62817	62274	62906	62869
62933	62434	62458	62828	62832	62920	62887
62948	62824	62471	62859	62888	62926	62908
62910	62953	62960				

Figure 1 Continued

Peoria Zip Codes (85)						
61415	61520	61540	61536	61607	61535	61755
61427	61531	61541	61539	61614	61550	61759
61431	61542	61565	61547	61615	61554	61516
61432	61543	61451	61552	61616	61564	61530
61433	61544	61517	61559	61625	61568	61545
61441	61553	61523	61562	61421	61571	61548
61459	61563	61524	61569	61426	61610	61561
61477	61369	61525	61602	61449	61611	61570
61482	61375	61526	61603	61479	61721	61729
61484	61377	61528	61604	61483	61733	61738
61501	61424	61529	61605	61491	61734	61742
61519	61537	61533	61606	61534	61747	61760
61771						

Rockford Zip Codes (25)						
61008	61038	61024	61073	61080	61102	61107
61011	61065	61063	61077	61088	61103	61108
61012	61016	61072	61079	61101	61104	61109
61111	61112	61114	61115			

Figure 2: Demographic Traits of Study Areas[1]



[1]Total population figures listed here are estimates.

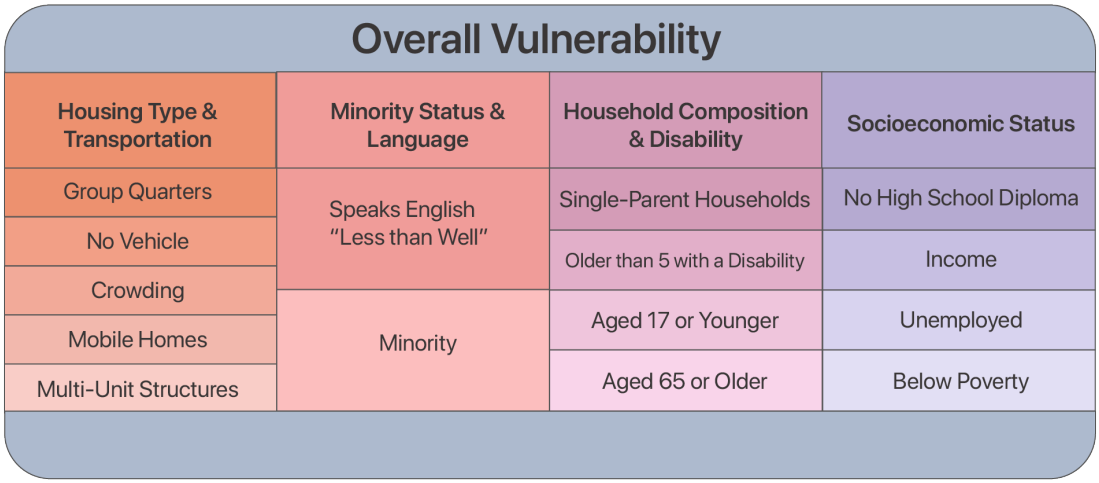
Data Source: U.S. Census Bureau American Community Survey Subject Tables 5-Year estimates, 2019. Tables S0101, B0101B, B0101C, B0101D, B0101E, B0101H, and B0101I, https://www.census.gov/acs/www/data/data-tables-and-tools/subject-tables/

The process used to identify areas in Illinois with high social vulnerability is as follows:

1. *Geographical areas defined:* 3 types of geographical areas were defined for the analysis: metropolitan statistical areas (MSA[1]) [n = 14], micropolitan statistical areas (μSA[2]) [n = 17], and counties that were neither [n = 39]. In Illinois, MSAs are usually composed of multiple counties, whereas μSAs are typically a single county. Included as an area is the Marion Health Region, which consists of MSAs, μSAs and freestanding counties. See Table 1 for more details.

2. *Social vulnerability measured:* Social Vulnerability Index (SVI) percentile rankings for all Illinois counties were obtained from the U.S. Centers for Disease Control and Prevention (CDC) (8, 9). Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health, such as natural or human-caused disasters and disease outbreaks (10). The CDC's Social Vulnerability Index (CDC-SVI) uses 15 U.S. census-derived social factor variables, including poverty, lack of vehicle access, and crowded housing, and groups them into 4 related themes: socioeconomic status, household composition, race/ethnicity/language, and housing/transportation (see Figure 3). Since the county-level CDC-SVI percentiles are standardized to the state, "scores" for individual counties ranged from 0 to 100. For MSAs and μSAs composed of more than one county, the CDC-SVI percentile score for the entire geography was calculated based on the population-weighted average of the state-standardized CDC-SVI percentile ranks for the component counties.

Figure 3: Social Vulnerability Index Themes and Variables. 5-Year Estimaes from the American Community Survey (ACS), 2014–2018a



[1]An MSA is a geographical region with a relatively high population density at its core and close economic ties throughout the area. It is composed of one or more counties (or equivalents) anchored by an urban center of at least 10,000 people plus adjacent counties that are socioeconomically tied to the urban center by commuting and employment.

[2]A uSA generally has fewer than 50,000 people.

Note: The Marion Health Region, one of the 7 Illinois Department of Public Health (IDPH) Regions, is located in the south/southeast section of the state (11). The Marion Health Region includes all 3 types of geographies (MSAs, µSAs, and freestanding counties), and, in contrast to the other 6 health regions, the SVI percentile scores of nearly all of its counties were above average. This is a particularly rural area of the state and, when analyzed individually at the MSA, µSA, or county level, doesn't reflect the widespread social vulnerabilities in this area. However, when analyzed collectively, in this case using IDPH's definition of this region, it can more effectively be recognized for the level of social vulnerability that exists here.

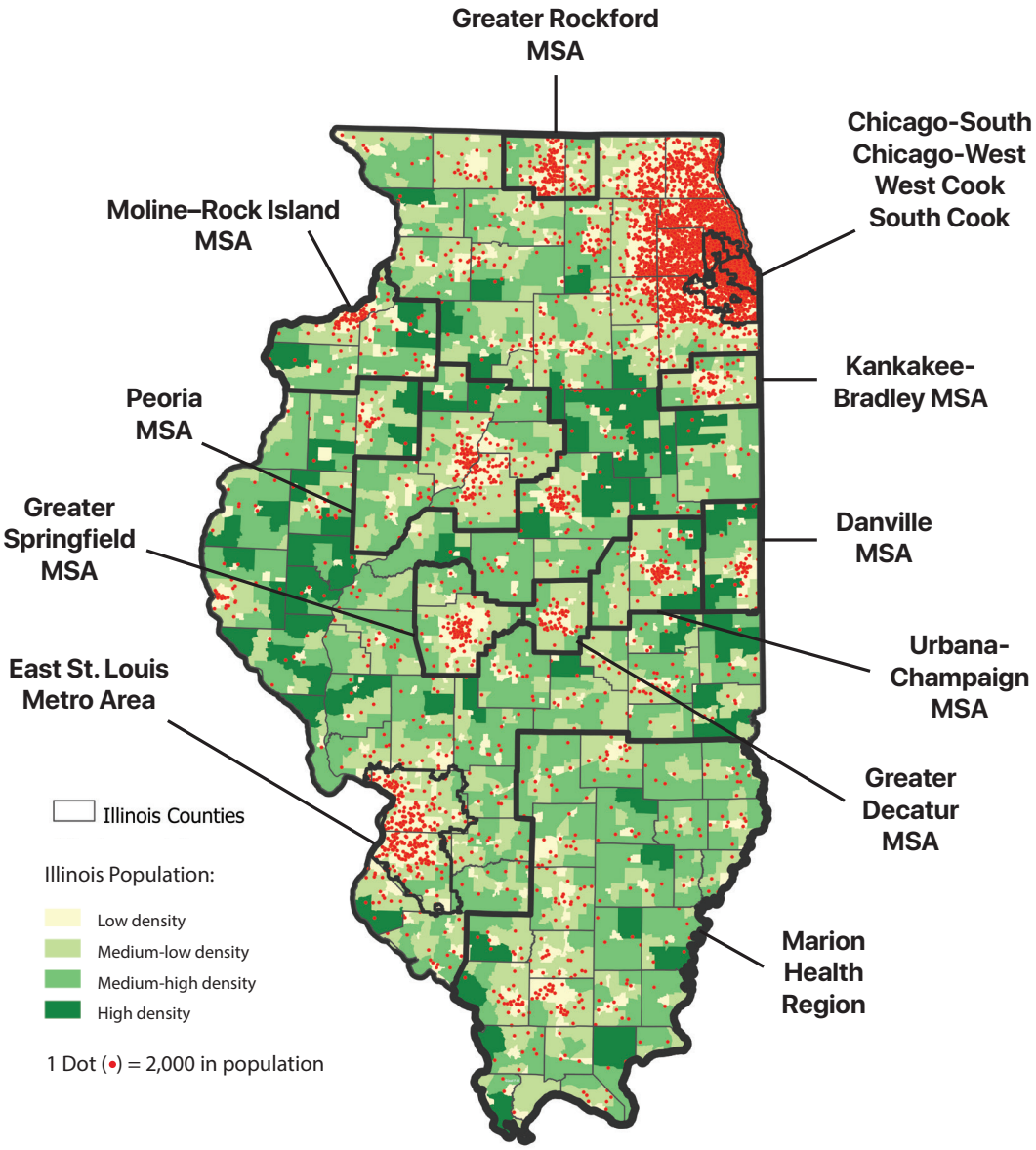
3. *Geographical areas ranked based on CDC-SVI percentile scores:* Geographical areas were ranked based on CDC-SVI percentile scores. Areas with scores >50 ("above average") [n = 35] were designated as potential priority locations (see Figure 4).

4. *Most socially vulnerable areas identified using zip code–level data:* Last, CDC-SVI percentile scores at the zip code level—where available—were used to help identify areas within counties and counties within statistical areas that were driving above average scores in geographical areas (see the last column in Table 1). Zip codes in each geographical area that were designated by the state as being disproportionately impacted by the economic effects of COVID-19 ("disproportionately impacted areas" or [DIAs]) (12) were also identified (see bolded zip codes in the last column of Table 1).

The findings in this report are organized around the following socially vulnerable areas: Danville, East St. Louis, the Marion Health Region, Peoria, and Rockford.

(Separate reports have been complied for the socially vulnerable areas in Cook County: South Chicago, South Cook, West Chicago, and West Cook.)

Figure 4: Areas in Illinois[1] with Above Average (>50th Percentile) Social Vulnerability Index Scores



[1] This map does not include 6 micropolitan areas in Illinois that have above average Social Vulnerability Scores. These areas are contained in Table 1.

MSA stands for metropolitan statistical area.

Table 1: Statewide Scan of Areas in Illinois with Above Average (>50th Percentile) Social Vulnerability Scores

1. Whole or Partial Metropolitan Statistical Areas (MSA) [8]

Areas with CDC Social Vulnerability Index Percentile Score > 50[1]	*Pop. Count*[2]	*CDC-SVI%-tile Score*[3]	*Percentile Score-Driving County, City, or Other Geography [SVI score]*	*Pop. Count*[2]	*Sample of Zip Codes w/ SVI Score > 754*[4] *("most vulnerable")*
Danville [Vermillion CTY]	75,758	98.0			**61832**
Bradley-Kankakee [Kankakee CTY]	109,862	91.1			60901, 60950, 60958
Rockford	336,116	88.1	Winnebago Cty [93.1]	282,572	61101, 61102, 61103
Chicago–South	1,026,829	87.6			**60621, 60636, 60637**
Chicago–West	590,175	83.5			**60623, 60624, 60644**
Decatur [Macon CTY]	104,009	78.2	Decatur, IL [77.5]	85,381	**62522, 62523, 62526**
Moline-Rock Island [Rock Island CTY]	206,229	69.0	Rock Island, IL [86.0]	141,879	**61201, 61443**
Springfield [Sangamon CTY]	197,661	60.4			62701, 62702, 62703
East St. Louis Metro[5]	522,652	58.8	East St. Louis [93.6]	55,995	**62201, 62203, 62204**
West Cook	529,407	58.0			**60104, 60153, 60804**
South Cook	895,830	56.6			**60472, 60501, 60827**
Champaign-Urbana [Champaign CTY]	209,448	53.5			**61801, 61820**
Peoria	400,561	50.1	Fulton, Cty [82.2], Peoria, Cty [77.2]	55,995	62201, 62203, 62204
Total	5,256,685				

2. Micropolitan Statistical Areas (μSA) [6]

Macomb, IL [McDonough CTY]	29,682	72.2			–
Freeport, IL [Stephenson CTY]	44,498	68.3			**61032**
Pontiac, IL [Livingston CTY]	35,648	62.4			–
Jacksonville, IL	38,609	61.2	Morgan Cty [67.3]	33,658	–
Galesburg, IL [Knox CTY]	51,453	60.2	Galesburg, IL [74.7]	33,964	**61401**
Charleston–Mattoon, IL	61,387	59.7	Coles Cty [66.3]	50,621	–
Total	261,277				

Table 1 Continued

3. Marion Health Region

Areas with CDC Social Vulnerability Index Percentile Score > 50[1]	*Pop. Count*[2]	*CDC-SVI%-tile Score*[3]	*Percentile Score-Driving County, City, or Other Geography [SVI score]*	*Pop. Count*[2]	*Sample of Zip Codes w/ SVI Score > 75*[4] *("most vulnerable")*
Statistical areas [5]					
Mount Vernon, IL µSA [Jefferson CTY]	37,684	97.0			**62846, 62864, 62872**
Centralia, IL µSA [Marion CTY]	37,205	95.1			**62801, 62882**
Cape Girardeau, MO-IL MSA [Alexander CTY]	5,761	94.9			62914
Paducah, KY-IL µSA [Massac CTY][6]	13,772	94.1			–
Carbondale-Marion MSA	136,764	72.9	Jackson [87.1]	58,551	**62901, 62902, 62903**
Other Marion Health Region Counties [15]					
Saline	23,491	99.0			62930, 62946
Lawrence	15,678	96.0			62460, 62466
Union	16,653	92.1			**62906**
Pulaski	5,335	85.2			–
Perry	20,916	84.2			–
Clay	13,184	83.2			62879
Franklin	38,469	86.1			–
Fayette	21,336	79.2			–
White	13,537	74.3			–
Gallatin	4,828	72.3			62934, 62954, 62984
Hardin	3,821	71.3			62919, 62931, 62947
Richland	15,513	65.4			–
Wayne	16,215	64.4			62885, 62886
Pope	4,177	56.4			–
Crawford	18,667	51.5			–
Total	463,006				

[1]CDC-SVI: https://www.atsdr.cdc.gov/placeandhealth/svi/index.html

[2]American Community Survey 2014–2018 5-Year Estimates: https://data.census.gov/cedsci/all?d=ACS%205-Year%20Estimates%20Detailed%20Tables

[3]From CDC based on 2018 estimates: https://www.atsdr.cdc.gov/placeandhealth/svi/data_documentation_download.html

[4]Zip-code level SVI scores were sourced from Covid-19 Healthcare Coalition/Mitre: https://c19hcc.org/resource/vulnerable-population

[5]St. Clair and Madison Counties

[6]Highest zip code = 62960, Metropolis (pop. ~ 11,250)

Last, a bolded zip code means that is also designated as being a disproportionately impacted area (DIA) due to COVID-19 by the Illinois Department of Commerce and Economic Opportunity: https://www2.illinois.gov/dceo/SmallBizAssistance/Pages/C19DisadvantagedBusGrants-test.aspx

2: Examined the most frequent and resource-intensive diseases driving Medicaid enrollee hospitalizations in the study areas and discovered a set of disease groups and conditions for which access to quality outpatient care can prevent the need for hospitalization

Once the areas of Illinois with the highest SVI scores were determined, the next step was to develop a true understanding of health outcomes for the most vulnerable population in each area. To measure health outcomes across study areas, FY2019 and FY2020 Medicaid patient-level utilization data was analyzed. (Note: the FY2020 data contains data from March to June 2020, the initial 3 months of the COVID-19 pandemic.) Three data sets were analyzed: an "institutional" data set, a "recipient file" data set, and, in the case of East St. Louis, an FY2018 "noninstitutional" data set.

The institutional data set contained Medicaid recipients' healthcare encounters (inpatient admissions, outpatient visits, and ED visits) at hospital/medical center systems. Key fields in this data set included the following:

- hospital system provider name (system in which the healthcare encounter occurred)
- zip code of hospital system provider (where the encounter occurred)
- recipient ID
- recipient zip code (indicating home address of recipient)
- service type (inpatient, outpatient, or renal)
- ER indication (indicates if the encounter is an emergency room visit)
- admission and discharge dates
- ICD-10 code and description (principal diagnosis for the encounter)
- Diagnosis related group (DRG) code

The noninstitutional data contained Medicaid recipients' outpatient visits to independent healthcare providers. Key fields in this data set included the following:

- provider type and description
- category of service and description
- provider zip code
- recipient ID
- recipient zip code (indicating home address of recipient)
- behavioral health indication (indicates if encounter is for behavioral health)
- service date
- ICD-10 code and description (principal diagnosis for the encounter)

(Note: FY2019 and FY2020 noninstitutional data was not available for analysis due to technical issues related to data size. See the "Limitations and Opportunities for Future Research" section of this report for more details as well as information about additional data-analysis constraints.)

The recipient file data set contained demographic data for Medicaid recipients in each study area, specifically sex, date of birth, and race data by unique recipient ID. (Note: Age at time of encounter was derived from recipient date of birth.)

The insitutional and recipient data sets represent hospitalization and ED visit encounters for FY2019 and FY2020 for all Medicaid recipients living within the zip codes of areas defined in this study (specifically, all recipients with home zip codes within the study areas). In other words, the data track hospital and ED utilization by

Medicaid recipients living in the study areas, regardless of where that care took place.

Key to analyzing the data was categorizing International Classification of Diseases, Clinical Modification (ICD-10-CM) codes, the principal diagnosis for a healthcare encounter. To bucket these diagnosis codes into analytic categories, the data analysis team used the Centers for Medicare & Medicaid Services' (CMS) 2020 ICD-10-CM Tabular List of Diseases and Injuries (https://www.cms.gov/Medicare/Coding/ICD10/Downloads/2020-Coding-Guidelines.pdf). This structured list of diagnosis codes is divided into 21 chapters based on body system or condition. Each chapter contains disease or injury blocks and the ICD-10 codes that make up those blocks (so the hierarchy is ICD-10 code > block > chapter). The chapters of the CMS ICD-10-CM Tabular List of Diseases and Injuries are as follows:

Chapter Number and Title	*ICD-10 Code Range*
1 Certain infectious and parasitic diseases	A00–B99
2 Neoplasms	C00–D49
3 Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	D50–D89
4 Endocrine, nutritional, and metabolic diseases	E00–E89
5 Mental, behavioral, and neurodevelopmental disorders	F01–F99
6 Diseases of the nervous system	G00–G99
7 Diseases of the eye and adnexa	H00–H59
8 Diseases of the ear and mastoid process	H60–H95
9 Diseases of the circulatory system	I00–I99
10 Diseases of the respiratory system	J00–J99
11 Diseases of the digestive system	K00–K95
12 Diseases of the skin and subcutaneous tissue	L00–L99
13 Diseases of the musculoskeletal system and connective tissue	M00–M99
14 Diseases of the genitourinary system	N00–N99
15 Pregnancy, childbirth, and the puerperium	O00–O9A
16 Certain conditions originating in the perinatal period	P00–P96
17 Congenital malformations, deformations, and chromosomal abnormalities	Q00–Q99
18 Symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified	R00–R99
19 Injury, poisoning, and other consequences of external causes	S00–T88
20 External causes of morbidity	V00–Y99
21 Factors influencing health status and contact with health services (includes the diagnoses codes for live-born infants)	Z00–Z99

Initial Analyses

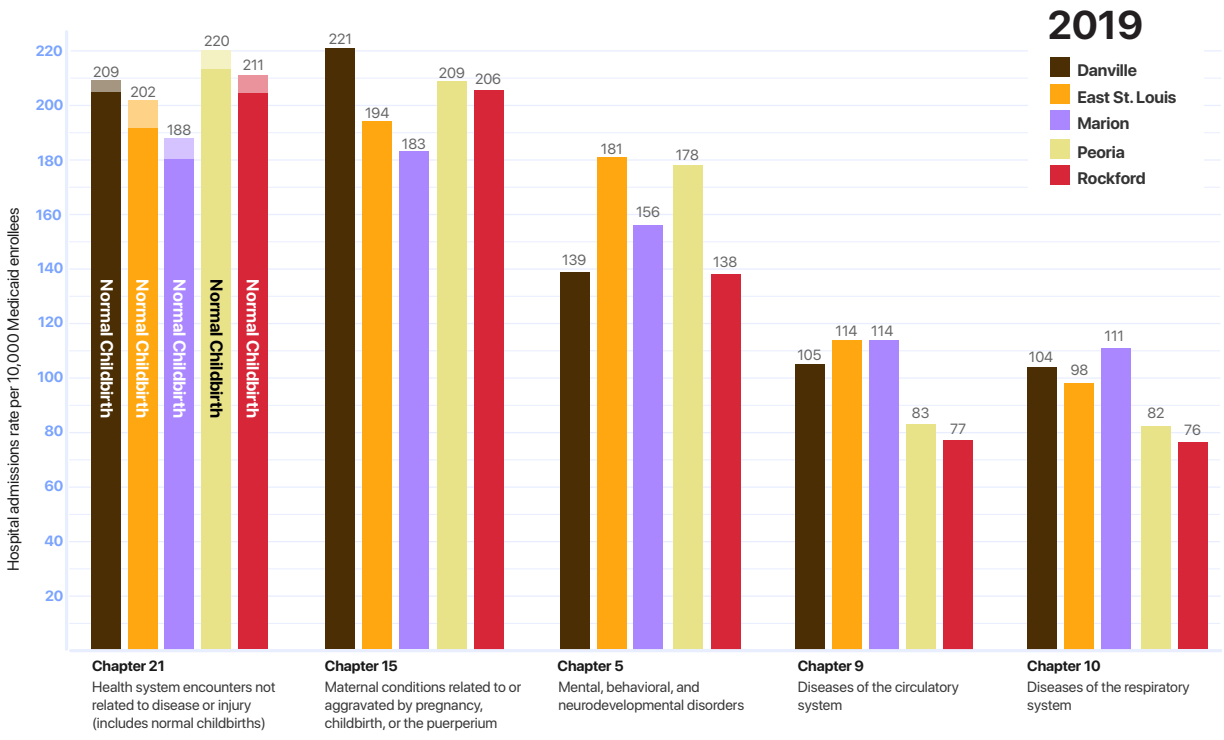
After getting to know the data sets via review of fields and variables, running histograms of variables, and doing basic data cleaning and new data creation (for example, patient age at time of the patient encounter), the data analytics team produced an initial set of descriptive statistics.

For the institutional data set, these initial analyses included looking at the distribution of healthcare encounters by demographic data (inpatient hospitalizations and ED visits by race, age, and sex by study area) and market share of hospitals receiving Medicaid patients by study area (see Appendix A for graphs of this data).

Initial analyses also included looking at the distribution of health outcomes, specifically the frequency distribution of chapters and blocks for inpatient hospitalizations. These analyses provided a basic picture of utilization and health outcomes.

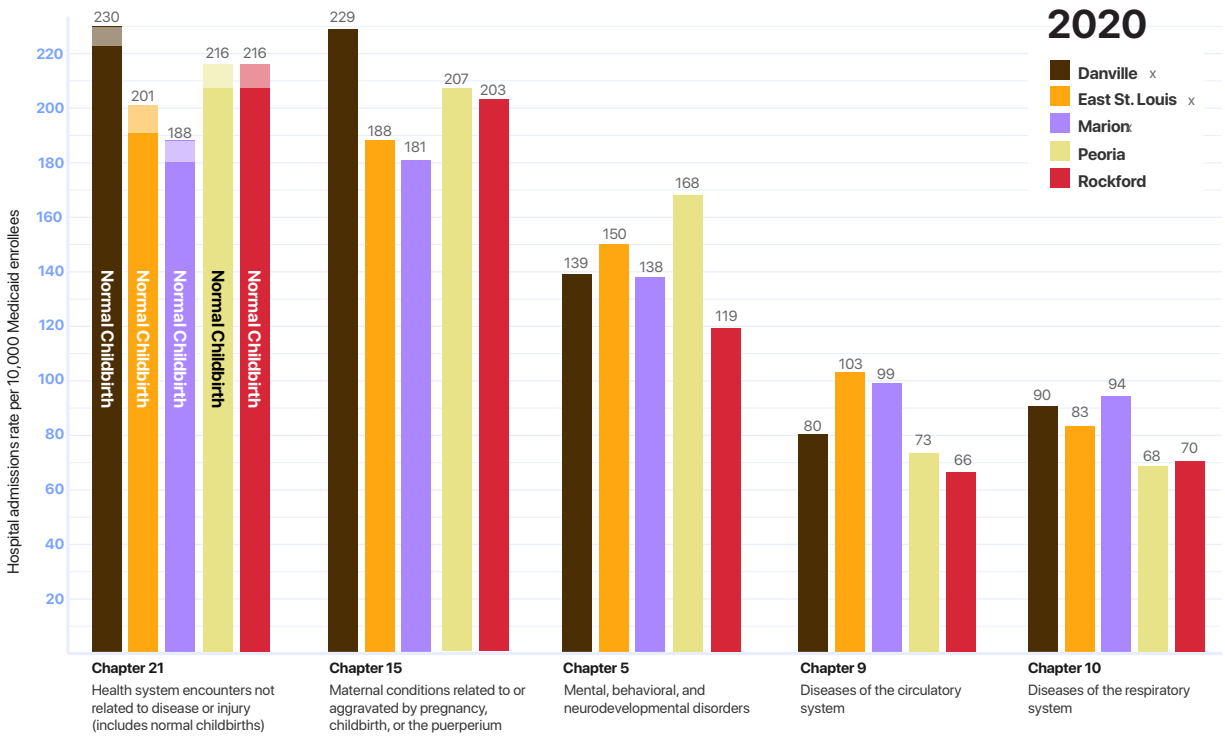
Across FY2019 and FY2020, healthcare encounters related to childbirth (Chapters 21 and 15) were the most frequent driver of hospital utilization. The vast majority of these childbirth encounters were normal or relatively uncomplicated. Following childbirth, the next most frequent hospital-level encounters included mental disorders, circulatory diseases, and respiratory diseases (Chapters 5, 9 and 10). See Figure 5.

Figure 5: Top 5 Most Frequent Inpatient Hospitalization Chapters by Study Area
(Frequency expressed as rate per 10,000 Medicaid enrollees)



Note: The 5 chapters of the CMS ICD-10-CM Tabular List of Diseases and Injuries shown here (21, 15, 5, 9, 10) represent the most frequent inpatient hospitalization chapters in all areas except Peoria. In Peoria, the 5most frequent chapters were 21, 15, 5, 1, and 9, respectively. Chapter 1 (diseases generally recognized as communicable or transmissible) ranked fourth in terms of inpatient hospitalizations in the Peoria study area, at a rate of 104.1 per 10,000 Medicaid enrollees.

Figure 5 Continued

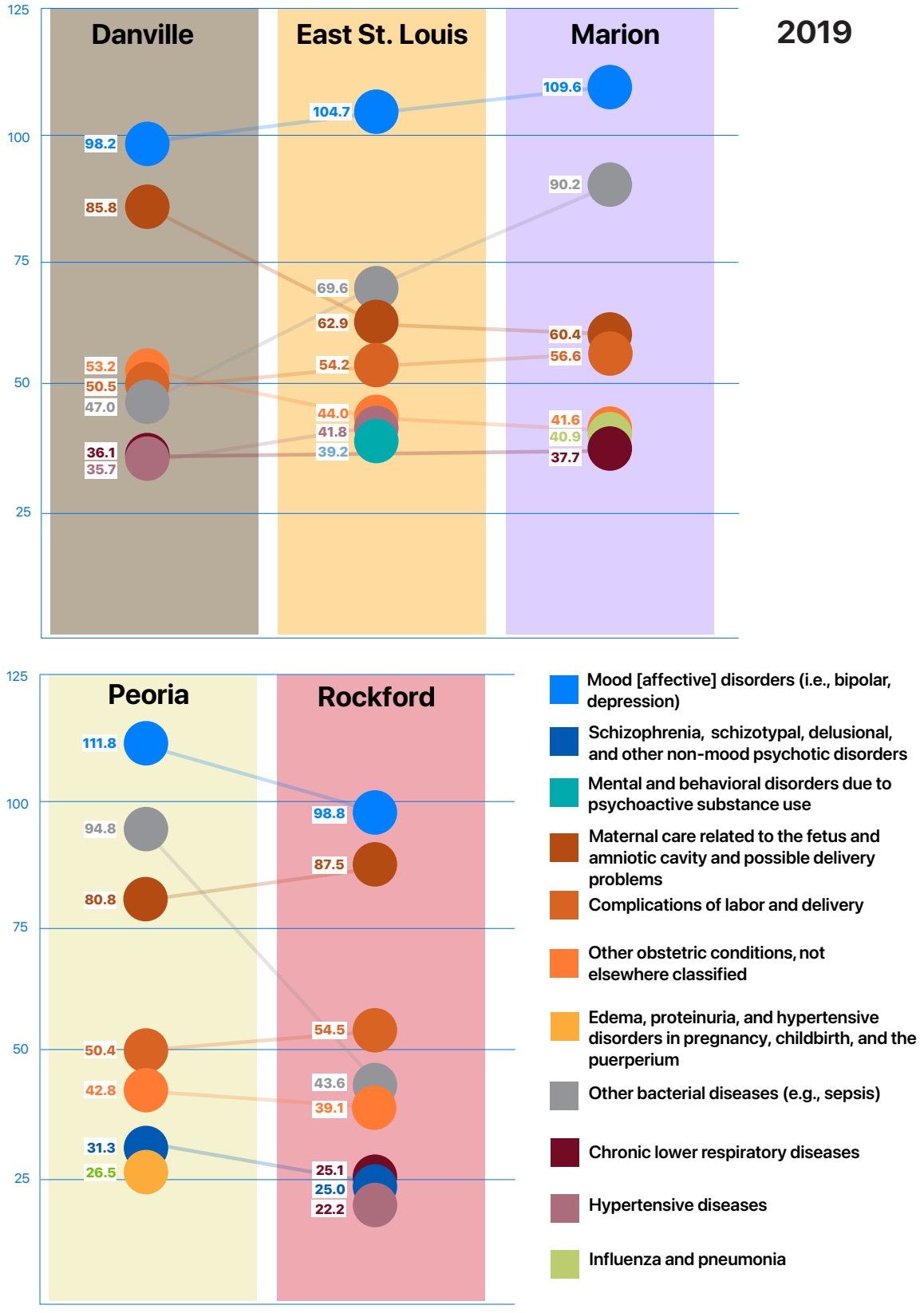


Note: The 5 chapters of the CMS ICD-10-CM Tabular List of Diseases and Injuries shown here (21, 15, 5, 9, 10) represent the most frequent inpatient hospitalization chapters in all areas except Peoria. In Peoria, the 5 most frequent chapters were 21, 15, 5, 1, and 19, respectively. Chapter 1 (diseases generally recognized as communicable or transmissible) ranked fourth in terms of inpatient hospitalizations in the Peoria study area, at a rate of 91.8 per 10,000 Medicaid enrollees. Chapter 19 (injury, poisoning, and certain other consequences of external causes) ranked fifth in Peoria at a rate of 74.1 per 10,000 Medicaid enrollees.

Figure 6 displays the most frequent blocks. Three of the most frequent hospitalization blocks in the Marion Health Region for both FY2019 and FY2020 are related to pregnancy or childbirth: maternal care related to the fetus and amniotic cavity and possible delivery problems; complications of labor and delivery; and other obstetric conditions, not elsewhere classified. All of these blocks point to complications related to pregnancy or childbirth. However, frequency distributions of the ICD-10 codes that make up these disease blocks show that most complications are mild and not preventable and are often, in fact, common issues related to childbirth. For example, in the Marion Health Region, one of the top complications is first and second degree perineal lacerations during delivery, a common, treatable occurrence during childbirth (see Figure 7).

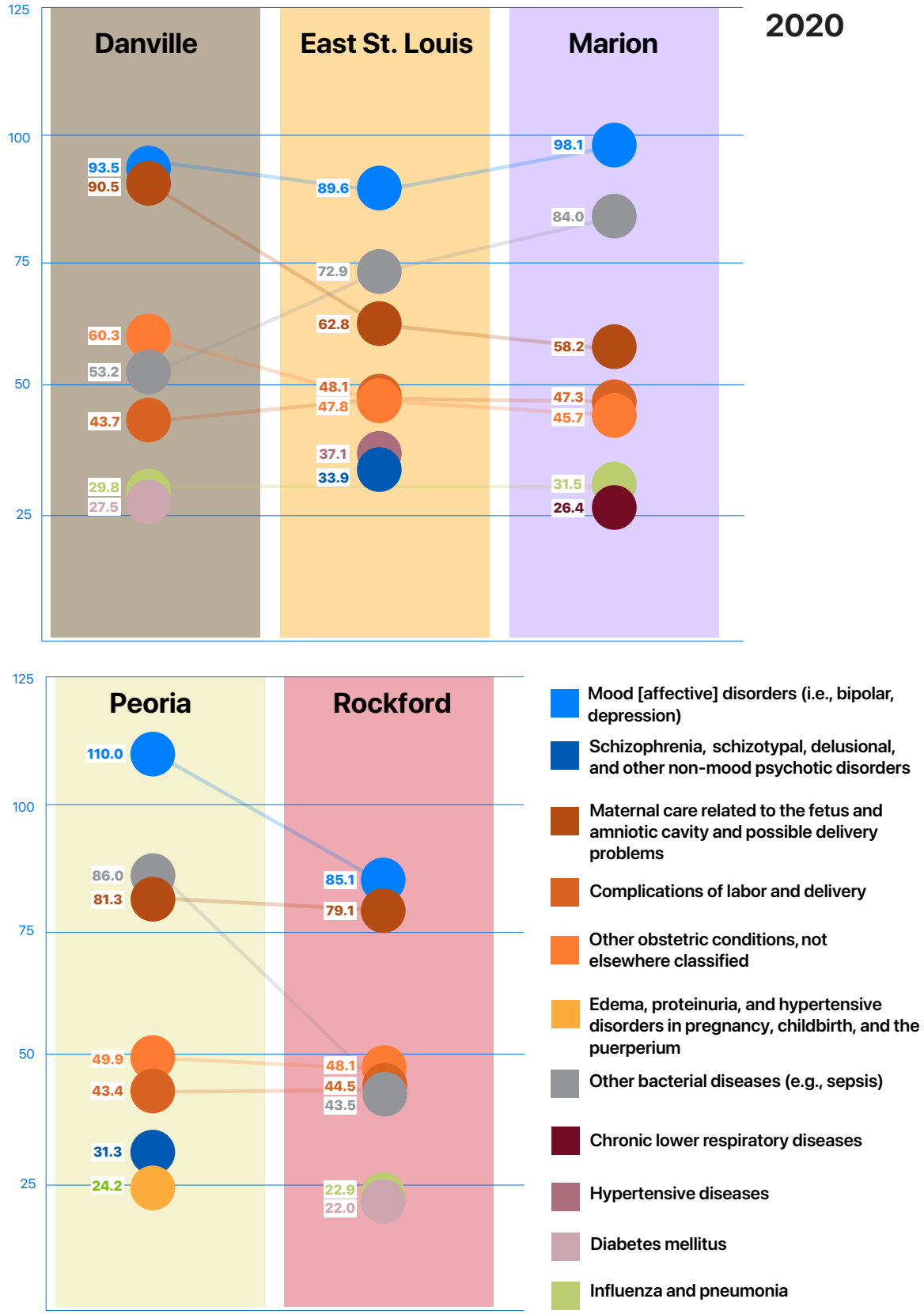
Otherwise, the most frequent hospitalization blocks in the Marion Health Region are mood [affective] disorders, other bacterial diseases (in particular, sepsis), influenza and pneumonia, and chronic lower respiratory diseases.

Figure 6: Top 7 Most Frequent Inpatient Hospitalization Blocks[1] by Study Area
(Frequency expressed as rate per 10,000 Medicaid enrollees)



[1]These figures do not include Chapter 21 blocks, which include blocks for normal childbirth.

Figure 6 Continued



[1]These figures do not include Chapter 21 blocks, which include blocks for normal childbirth.

Figure 7: Distribution of ICD-10s of Top Childbirth Complications Blocks[1] by Study Area

2019

Danville

- **8.3%** Maternal care for low transverse scar from previous cesarean delivery
- **6.9%** Post-term pregnancy
- **6.1%** Streptococcus B carrier state complicating childbirth
- **6.1%** First/second degree perineal laceration during delivery
- **4.6%** Abnormality in fetal heart rate/rhythm complicating L&D
- **68.1%** Others *(Spread among 89 different ICD-10s)*

East St. Louis

- **13.3%** Maternal care for low transverse scar from previous cesarean delivery
- **8.0%** First/second degree perineal laceration during delivery
- **6.7%** Streptococcus B carrier state complicating childbirth
- **4.6%** Abnormality in fetal heart rate/rhythm complicating L&D
- **4.2%** Maternal care for known/suspected poor fetal growth
- **63.1%** *Others (Spread among 185 different ICD-10s)*

Marion Health Region

- **12.6%** Maternal care for low transverse scar from previous cesarean delivery
- **10.8%** First/second degree perineal laceration during delivery
- **9.0%** Streptococcus B carrier state complicating childbirth
- **5.9%** Post-term pregnancy
- **4.5%** Maternal care for known/suspected poor fetal growth
- **57.2%** Others *(Spread among 175 different ICD-10s)*

Peoria

- **11.8%** Maternal care for low transverse scar from previous cesarean delivery
- **7.9%** Streptococcus B carrier state complicating childbirth
- **7.0%** Post-term pregnancy
- **6.7%** First/second degree perineal laceration during delivery
- **4.5%** Abnormality in fetal heart rate/rhythm complicating L&D
- **62.2%** Others *(Spread among 155 different ICD-10s)*

Rockford

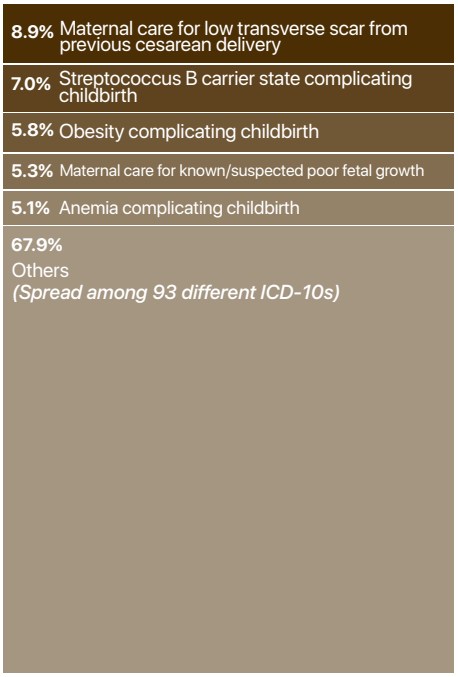
- **11.6%** Maternal care for low transverse scar from previous cesarean delivery
- **9.8%** Post-term pregnancy
- **9.6%** Streptococcus B carrier state complicating childbirth
- **8.0%** Abnormality in fetal heart rate/rhythm complicating L&D
- **5.5%** First/second degree perineal laceration during delivery
- **55.4%** Others *(Spread among 141 different ICD-10s)*

[1]The charts here contain ICD-10s from the top pregrancy, labor and delivery, and post-partum complication blocks across all 5 areas: complications of labor and delivery; maternal care related to the fetus and amniotic cavity; and other obstetric conditions, not elseshere classified.
Note: L&D = labor and delivery.

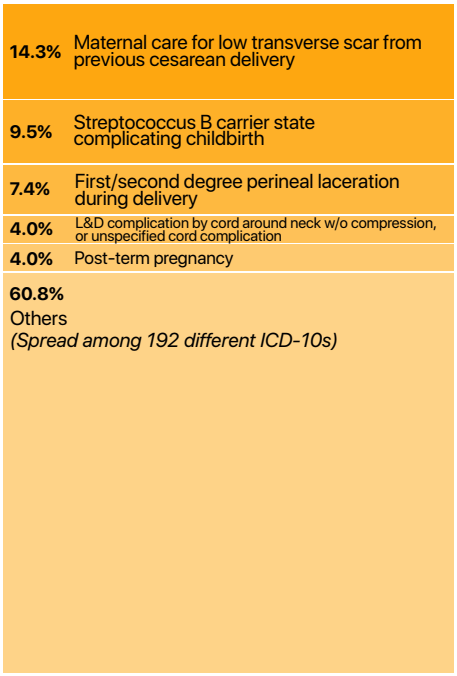
Figure 7 Continued

2020

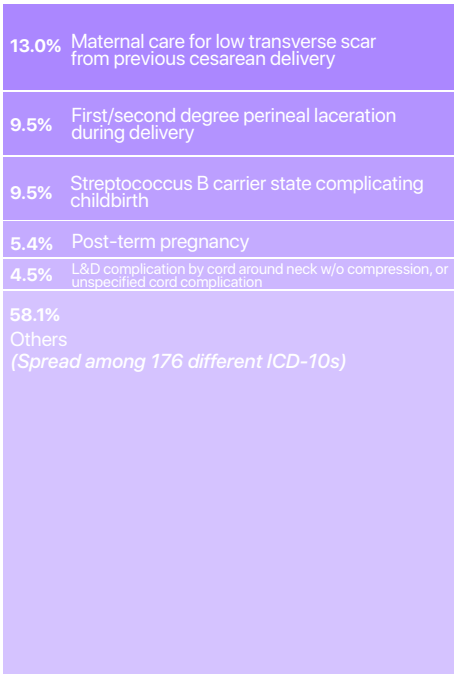
Danville



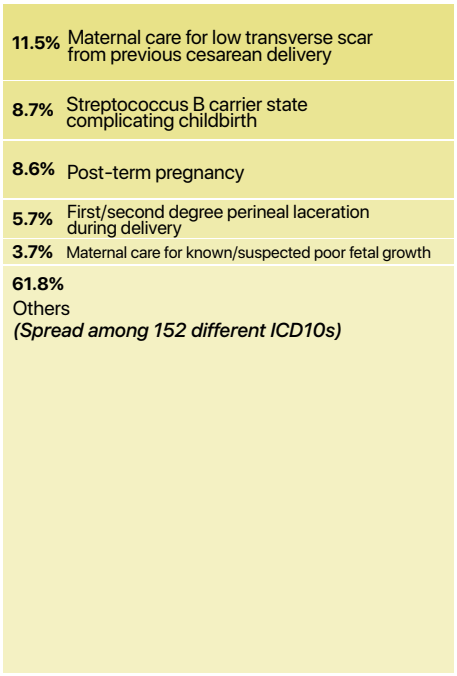
East St. Louis



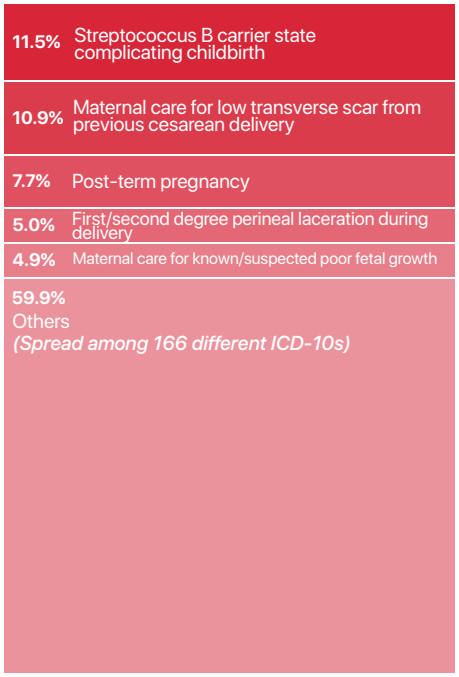
Marion Health Region



Peoria



Rockford



[1]The charts here contain ICD-10s from the top pregrancy, labor and delivery, and post-partum complication blocks across all 5 areas: complications of labor and delivery; maternal care related to the fetus and amniotic cavity; and other obstetric conditions, not elseshere classified.
Note: L&D = labor and delivery.

Pairing Frequency and Readmission Data

To provide a more detailed understanding of health outcomes, hospitalization frequency data was paired with readmission rates, with readmission rates being a measure of "resource intensiveness."

Readmission was defined for each patient per disease block based on the total number of inpatient admissions. To calculate readmissions for a disease block, the data analytics team subtracted one from each patient's total number of admissions within that disease block during the year. So, if a patient in a particular disease block had only one admission, the number of readmissions was 0. An average readmission rate was calculated for each disease block and represents the average number of readmissions among all patients per disease block per year.

Readmission rates were cross-tabulated with frequency rates by disease block in each study area. Isolating the top sixth ("sextile") disease blocks for both measures produces a view of the most frequent and resource-intensive disease blocks in each area (see Tables 2a and 2b).

Most Frequent and Resource-Intensive Diseases and Conditions

In Tables 2a and 2b, a clear pattern emerges. The 3 groups comprising the most frequent and resource-intensive hospitalizations, in the Marion Health Region and in other areas, are mental illnesses, substance use disorders, and a third group organized around a set of chronic illnesses identified as "ambulatory care sensitive conditions" (ACSCs).

By definition, ACSCs are health conditions for which good outpatient care can potentially prevent the need for hospitalization or early intervention can prevent complications and progression to more severe disease (13).

The same can be said for mood [affective] disorders (made up mostly of bipolar and depressive disorders; see Figure 8) and mental and behavioral disorders due to psychoactive substance use (made up mostly of alcohol and opioid use disorders; see Figure 9).

Given this, these frequent, resource-intensive and outpatient-treatable disease groups and conditions became the focus of the research:

- mood [affective] disorders (in particular, bipolar and depressive disorders)
- mental and behavioral disorders due to psychoactive substance use disorders (in particular, alcohol and opioid use disorders)
- ACSCs (in particular, hypertension, asthma/COPD, diabetes, and heart diseases such as congestive heart failure)

Outpatient Care Rates Prior and Subsequent to Hospital-Level Care

A previous analysis of FY2018 data for the East St. Louis area shows that *outpatient care prior to or subsequent to hospital-level care for these disease groups and conditions is relatively low*, indicating that many patients who were hospitalized for these diseases or disorders did not engage in outpatient care to manage their conditions (see Figure 10). For example, outpatient care within 3 months after hospital-level care for a mental disorder, falls well below the national Medicaid benchmark of 56% of discharges receiving follow-up care within 30 days after a hospitalization for mental illness (14, 15). FY2018 analyses completed for these

Table 2a: FY2019 Disease Blocks in the Top Sextile[1] for Both Frequency Rate and Average Hospital Readmission Score[2] (Ranked by Product of Frequency Rate and Readmission Score)

■ Mental illnesses ■ Substance use disorders ■ ACSCs

Danville	East St. Louis	Marion	Peoria	Rockford
1. Mood affective disorders (bipolar, depression)	1. Mood affective disorders (bipolar, depression)	1. Mood affective disorders (bipolar, depression)	1. Mood affective disorders (bipolar, depression)	1. Mood affective disorders (bipolar, depression)
2. Hypertensive diseases	2. Schizophrenia, schizotypal disorders	2. Schizophrenia, schizotypal disorders	2. Schizophrenia, schizotypal disorders	2. Schizophrenia, schizotypal disorders
3. Diabetes mellitus	3. Hemolytic anemias	3. Diabetes mellitus	3. Psychoactive substance use disorders (alcohol, opioids)	3. Diabetes mellitus
4. Other bacterial diseases	4. Hypertensive diseases	4. Hypertensive diseases	4. Diabetes mellitus	4. Chronic lower respiratory diseases (asthma, COPD)
5. Schizophrenia, schizotypal disorders	5. Diabetes mellitus	5. Chronic lower respiratory diseases (asthma, COPD)	5. Complications of surgical/medical care	5. Diseases of liver
6. Other diseases of the respiratory system	6. Psychoactive substance use disorders (alcohol, opioids)	6. Complications of surgical/medical care	6. Hypertensive diseases	6. Psychoactive substance use disorders (alcohol, opioids)
7. Cerebrovascular diseases	7. Chronic lower respiratory diseases (asthma, COPD)	7. Disorders of gall-bladder, biliary tract, and pancreas	7. Disorders of gall-bladder, biliary tract, and pancreas	7. Hypertensive diseases
8. Chronic lower respiratory diseases (asthma, COPD)	8. Other diseases of the respiratory system	8. Other diseases of the respiratory system	8. Chronic lower respiratory diseases (asthma, COPD)	8. Other diseases of the respiratory system
9. Psychoactive substance use disorders (alcohol, opioids)	9. Cerebrovascular diseases	9. Psychoactive substance use disorders (alcohol, opioids)	9. Cerebrovascular diseases	9. Disorders of gall-bladder, biliary tract, and pancreas
10. Metabolic disorders	10. Complications of surgical/medical care	10. Diseases of liver	10. Episodic and paroxysmal disorders	10. Complications of surgical/medical care
11. Other forms of heart disease	11. Disorders of gall-bladder, biliary tract, and pancreas	11. Noninfective enteritis and colitis		11. Cerebrovascular diseases
12. Diseases of esophagus, stomach, and duodenum	12. Noninfective enteritis and colitis			
	13. Behavioral and emotional disorders			

[1] Sextile refers to the top sixth of the disease blocks found in the 2020 ICD-10-CM Tabular List of Diseases and Injuries for both frequency and early readmission, representing ~16.67% of all the disease blocks.
[2] This analysis excludes Chapter 21 of the ICD-10-CM Tabular List of Diseases and Injuries which contains encounters with the healthcare system not related to injury or disease, including encounters for normal newborns.

Table 2b: FY2020 Disease Blocks in the Top Sextile[1] for Both Frequency Rate and Average Hospital Readmission Score[2] (Ranked by Product of Frequency Rate and Readmission Score)

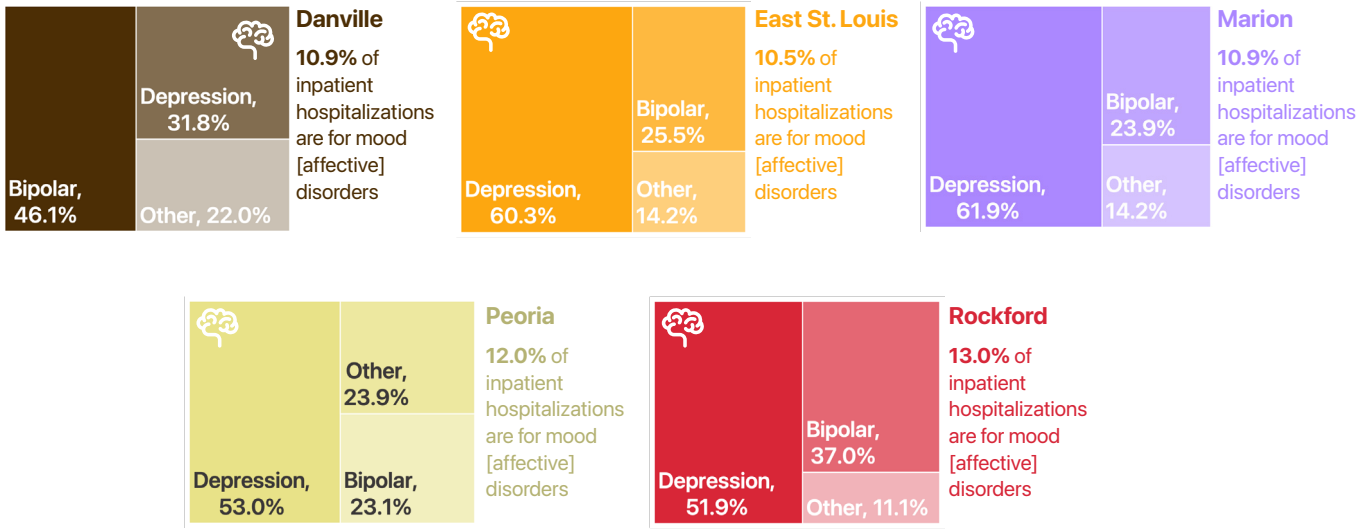
■ Mental illnesses ■ Substance use disorders ■ ACSCs

Danville	East St. Louis	Marion	Peoria	Rockford
1. Mood affective disorders (bipolar, depression)	1. Mood affective disorders (bipolar, depression)	1. Mood affective disorders (bipolar, depression)	1. Schizophrenia, schizotypal disorders	1. Mood affective disorders (bipolar, depression)
2. Hypertensive diseases	2. Schizophrenia, schizotypal disorders	2. Schizophrenia, schizotypal disorders	2. Mood affective disorders (bipolar, depression)	2. Schizophrenia, schizotypal disorders
3. Diabetes mellitus	3. Hemolytic anemias	3. Hypertensive diseases	3. Hemolytic anemias	3. Hemolytic anemias
4. Schizophrenia, schizotypal disorders	4. Hypertensive diseases	4. Hemolytic anemias	4. Hypertensive diseases	4. Hypertensive diseases
5. Complications of surgical/medical care	5. Other bacterial diseases	5. Diabetes mellitus	5. Other bacterial diseases	5. Diabetes mellitus
6. Hemolytic anemias	6. Diabetes mellitus	6. Psychoactive substance use disorders (alcohol, opioids)	6. Psychoactive substance use disorders (alcohol, opioids)	6. Psychoactive substance use disorders (alcohol, opioids)
7. Psychoactive substance use disorders (alcohol, opioids)	7. Psychoactive substance use disorders (alcohol, opioids)	7. Cerebrovascular diseases	7. Diabetes mellitus	7. Cerebrovascular diseases
8. Cerebrovascular diseases	8. Cerebrovascular diseases	8. Chronic lower respiratory diseases (asthma, COPD)	8. Complications of surgical/medical care	8. Other diseases of the respiratory system
9. Episodic and paroxysmal disorders	9. Disorders of gall bladder, biliary tract, and pancreas	9. Complications of surgical/medical care	9. Other diseases of the respiratory system	9. Disorders of gall-bladder, biliary tract, and pancreas
10. Metabolic disorders	10. Complications of surgical/medical care	10. Other forms of heart disease	10. Chronic lower respiratory diseases (asthma, COPD)	10. Chronic lower respiratory diseases (asthma, COPD)
		11. Disorders of gall-bladder, biliary tract, and pancreas	11. Episodic and paroxysmal disorders	11. Metabolic disorders
			12. Cerebrovascular diseases	
			13. Other forms of heart disease	
			14. Disorders of gall-bladder, biliary tract, and pancreas	
			15. Other diseases of the urinary system	

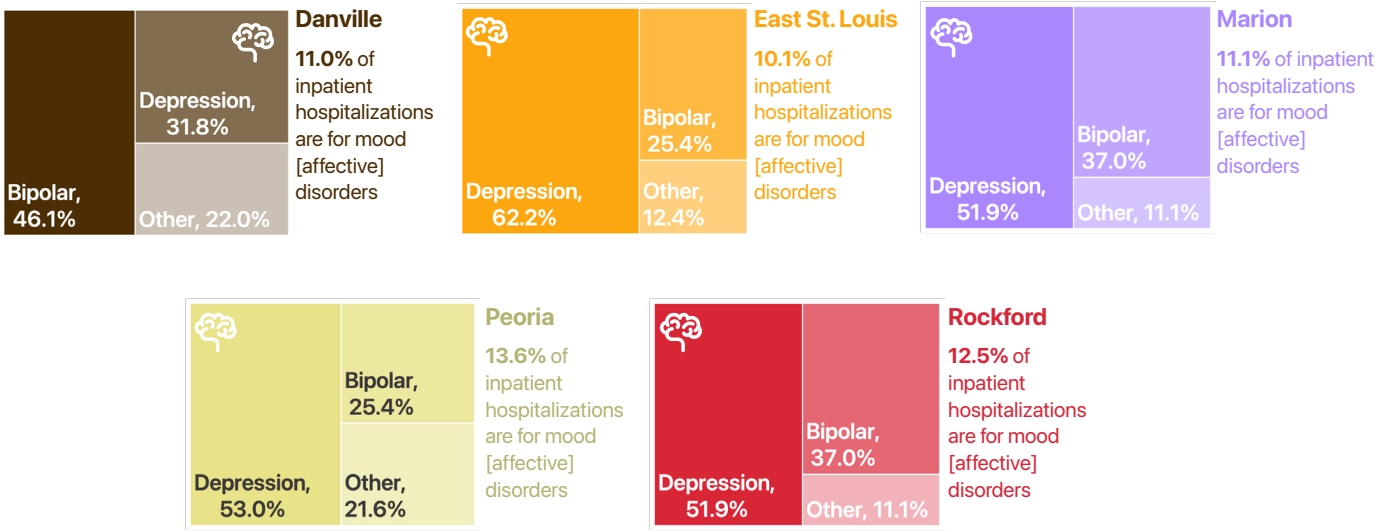
[1] Sextile refers to the top sixth of the disease blocks found in the 2020 ICD-10-CM Tabular List of Diseases and Injuries for both frequency and early readmission, representing ~16.67% of all the disease blocks.
[2] This analysis excludes Chapter 21 of the ICD-10-CM Tabular List of Diseases and Injuries which contains encounters with the healthcare system not related to injury or disease, including encounters for normal newborns.

Figure 8: Proportion of Inpatient Hospitalizations for Depressive Disorders, Bipolar Disorders, and Other ICD-10s[1] within the Mood [Affective] Disorders Block across Study Areas

2019



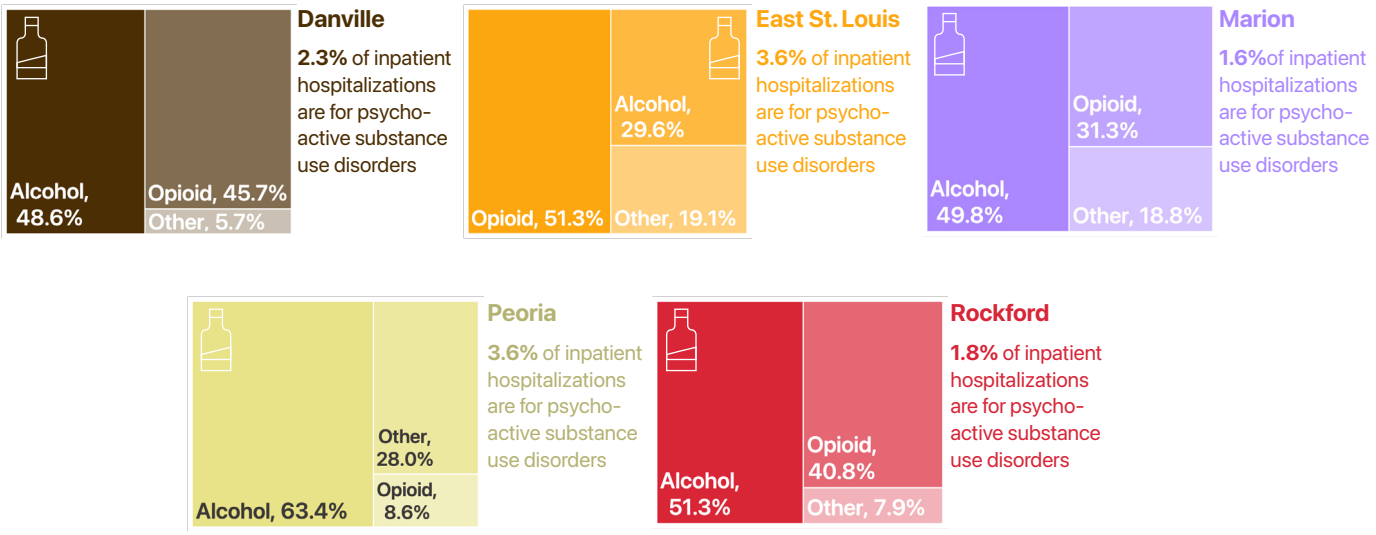
2020



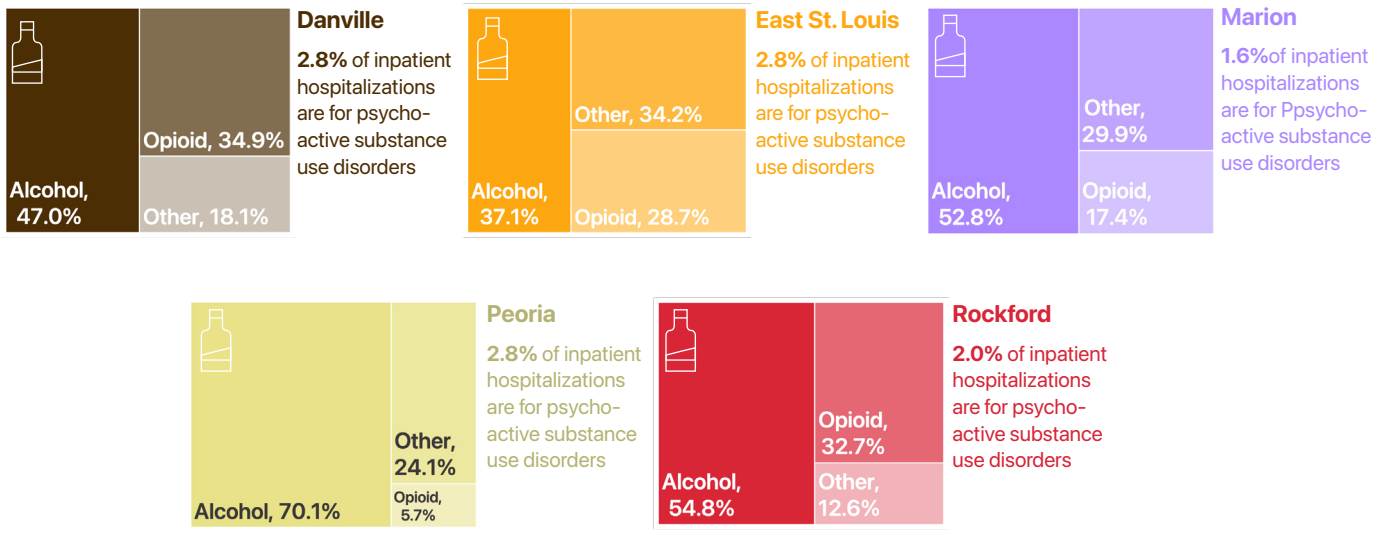
[1] Depression in this figure includes all "depressive disorder" ICD-10 codes in the mood [affective] disorders block. Bipolar includes all ICD-10 codes labeled "bipolar." The "other" category includes ICD-10 codes for conditions such as cyclothymic disorder, dysthymic disorder, manic episodes with and without psychotic symptoms, persistent mood [affective] disorders, and unspecified mood [affective] disorders.

Figure 9: Proportion of Hospitalizations for Alcohol Use Disorders, Opioid Use Disorders, and Other ICD-10s within the Psychoactive Substance Use Disorders Block across Study Areas

2019



2020

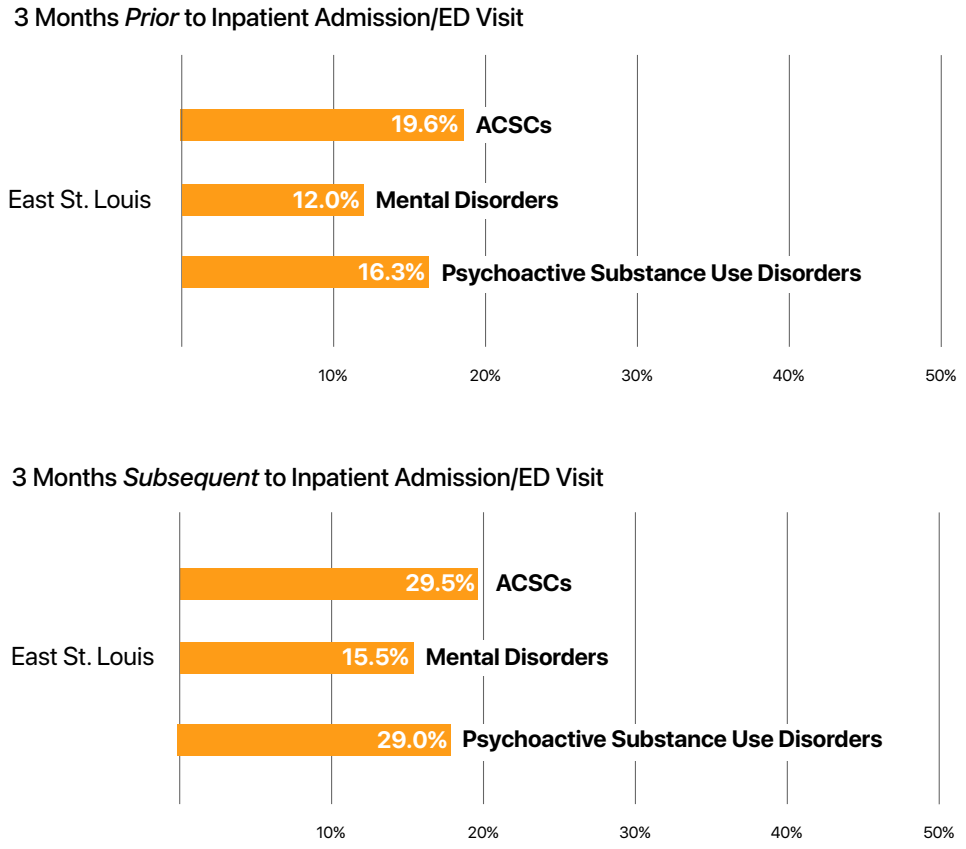


Note: "Other" psychoactive substance use disorders includes ICD-10 codes for cannabis, cocaine, hallucinogens, sedatives, and other psychoactive substances or stimulants.

disease groups and conditions in socially vulnerable areas in Cook County produced similar results.

(Note: All outpatient encounters were used for this analysis, whether related to the hospitalization diagnosis or not. Thus, the results presented in Figure 10 can be considered a conservatively generous estimate of outpatient care for those with selected and preventable inpatient admissions or ED visits. Additionally, the outpatient care analysis presented here is for FY2018. Technical issues related to data file size prevented access to, and analysis of, FY2019 and FY2020 outpatient data.) The low rates of outpatient care observed prior to and following hospitalizations and ED

Figure 10: East St. Louis 2018 / Proportion of Prior and Subsequent Outpatient Care among Patients Who Received Hospital-Level Care for ACSCs, Mental Disorders, and Psychoactive Substance Use Disorders



ACSCs consist of all of the ICD-10 principal diagnosis codes categorized as Ambulatory Care Sensitive Conditions by the Agency for Healthcare Research and Quality.

Mental Disorders consist of all of the ICD-10 principal diagnosis codes from Chapter 5 of the CMS Tabular List of Diseases and Injuries, excluding ICD-10s for substance use disorders.

Psychoactive Substance Use Disorders consist of all of the ICD-10 principal diagnosis codes from Chapter 5 of the CMS Tabular List of Diseases and Injuries for the "Mental and behavioral disorders due to psychoactive substance use" disease block.

To look for outpatient care evidence prior to hospital-level care, patients who had an initial hospitalization or ED visit for mental disorders, substance use disorders or ACSCs in the last 3 quarters of FY2018 (10/01/2017 to 06/30/2018) were identified. The proportion of these patients who had outpatient care encounters within 3 months *prior* to their hospital admission date or ED visit was then tabulated.

visits motivate an interest in improved care for these disease groups and conditions, but it is possible to more directly link hospital use to the lack of preventive care in the Marion Health Region and the other study areas. ACSCs are a group of conditions identified by the Agency for Healthcare Research and Quality (AHRQ) as indicators of the accessibility, quality, and efficiency of the healthcare ecosystem in an area (16). Hospitalization rates for ACSCs are, in fact, an *established* metric for evaluating population access to care. Prior research has established that communities with poor access to outpatient care have higher rates of hospitalization for chronic illnesses and that improving this access is an effective way to reduce hospitalization rates for ACSCs (17). Furthermore, ACSCs and mental disorders are linked: Patients with coexisting mental disorders are 2 to 5 times more likely to be admitted to EDs for ACSCs (18–22).

AHRQ developed Preventative Quality Indicators (PQIs), measures based on ACSC hospital inpatient discharge data and designed to identify outpatient care quality and access issues, including appropriate follow-up care after hospital discharge. These widely used benchmarks for healthcare accessibility and quality are based on a subset of the ACSC codes for hospital admissions in the John Billings algorithm (23). Specifically, PQIs use data from hospital discharges to identify admissions that might have been avoided through access to high-quality outpatient care. In other words, while PQIs are based on hospital inpatient data, they provide insight into the quality of the healthcare ecosystem *outside* hospitals and in the community by measuring preventable complications that occur in a given population (in a community or region) (24). The PQIs consist of the following 11 disease-specific ACSCs, which are measured as rates of admission to the hospital:

- diabetes mellitus, short-term complications admission rate
- diabetes mellitus, long-term complications admission rate
- uncontrolled diabetes mellitus admission rate
- chronic obstructive pulmonary disease or asthma, older adults (40+) admission rate
- hypertension admission rate
- congestive heart failure admission rate
- dehydration admission rate
- bacterial pneumonia admission rate
- urinary tract infection admission rate
- asthma, younger adults (18–39) admission rate
- rate of lower extremity amputation among patients with diabetes

Each of the above disease admission rates is its own PQI. AHRQ compiles these measures into *composite* PQIs as follows:

- PQI 90 Composite combines hospital admission rates for both acute and chronic PQIs
- PQI 91 Acute Composite is a composite indicator of acute, episodic admission rates and consists of the following admission rates:
  - bacterial pneumonia
  - urinary tract Infection
- PQI 92 Chronic Composite is a composite indicator of chronic disease admission rates and consists of the following admission rates:
  - diabetes Mellitus, short-term complications
  - diabetes mellitus, long-term complications
  - COPD or asthma, older adults (40+)
  - hypertension

        - congestive heart failure
        - dehydration
        - uncontrolled diabetes mellitus
        - asthma, younger adults (18–39)
        - rate of lower extremity amputation among patients with diabetes
    - PQI 93 Diabetes Composite is a composite indicator of diabetes admission rates and consists of the following admission rates:
        - diabetes mellitus, short-term complications
        - diabetes mellitus, long-term complications
        - uncontrolled diabetes mellitus

AHRQ publishes national benchmarks for PQIs. Age-adjusted admission rates for composite PQIs in the Marion Health Region far outpace both national benchmarks and other study areas (see Figure 11).

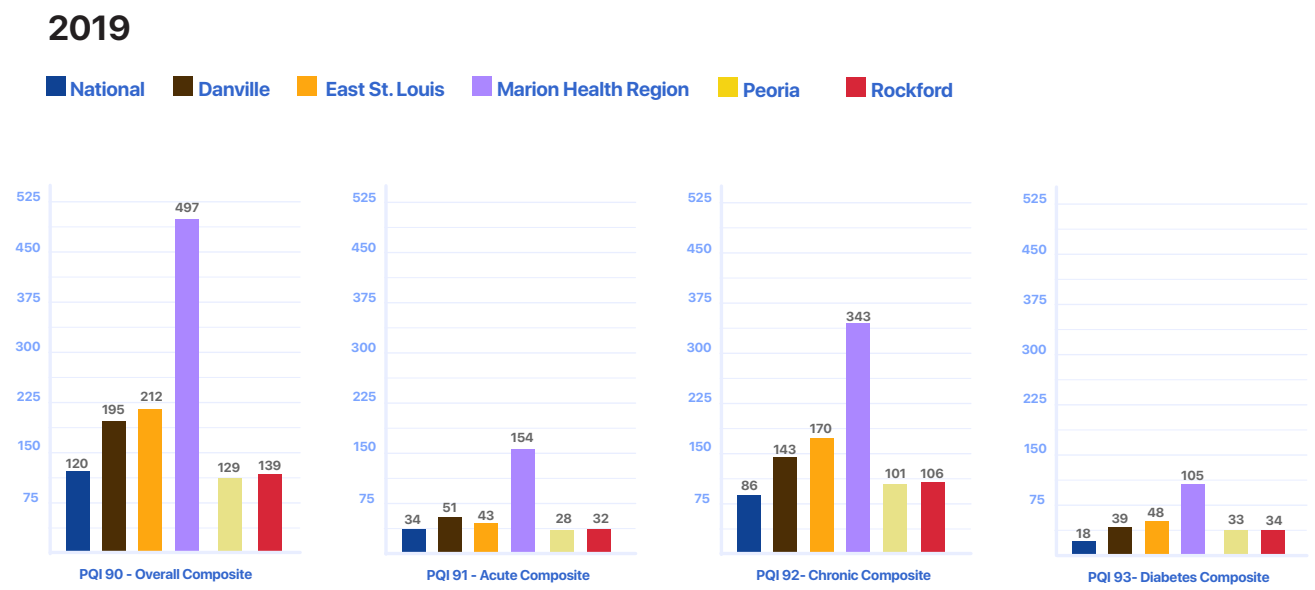
Results of multivariate logistic regressions show that, in the Marion Health Region, adults age 40 and over and Native Americans are the populations most associated with hospitalizations for ACSCs, in general. Women age 40 and over are associated with acute ACSC hospitalizations. Black and Native American men age 40 and over are associated with chronic ACSC hospitalizations. And, finally, in the Marion Health Region, men are most associated with diabetes-related hospitalizations. (See Table 3.)

While not formally part of the definition of ACSCs or the related PQIs, bipolar disorder, depressive disorders, and alcohol and opiod use disorders are all outpatient-treatable. These disorders account for the majority of disorders within the mood [affective] disorders block and the psychoactive substance abuse disorder block. Results of multivariate logistic regressions show that teens, age 12–19, are associated with hospitalizations for depression and Native Americans are associated with bipolar and alcohol use disorder hospitalizations in the Marion Health Region. There are no population characteristic associations with opioid use disorder hospitalizations in the Marion Health Region. (See Tables 4–7.)

The data paint a clear picture: Medicaid enrollees have poor access to outpatient care and higher levels of prevention-sensitive hospitalizations in all study areas. This is particularly true for the Medicaid population in the Marion Health Region, given the area's high rates of hospitalizations for ACSCs. Improving accessibility to quality primary and specialty care (including behavioral healthcare and detection of ACSCs and mental health comorbidities) will be critical to decreasing hospital admissions for ACSCs as well as hospitalizations for mood affective and substance use disorders.

(Note: Rates of hospitalization for ACSCs are being analyzed to provide an indication of healthcare delivery gaps in a population defined by a geography—in this case, the selected study areas. In Figure 11, these rates are compared against *national* PQIs rates which are made up of discharge data from the general population. These benchmarks are being used to gauge, directionally, the state of the healthcare ecosystem in each area. Data upgrades are needed to create additional benchmarks, such as national PQI rates by insurance status [for example, Medicaid vs. private] or Illinois PQI rates, statewide and by insurance status. See the "Data Limitations and Opportunities for Future Research" section for more information.)

Figure 11: Composite Preventative Quality Indicators (PQIs 90, 91, 92, and 93) Hospital Admission Rates per 10,000 Medicaid Recipients, Age-Adjusted, by Study Area with National Benchmarks for the General Population as Reference



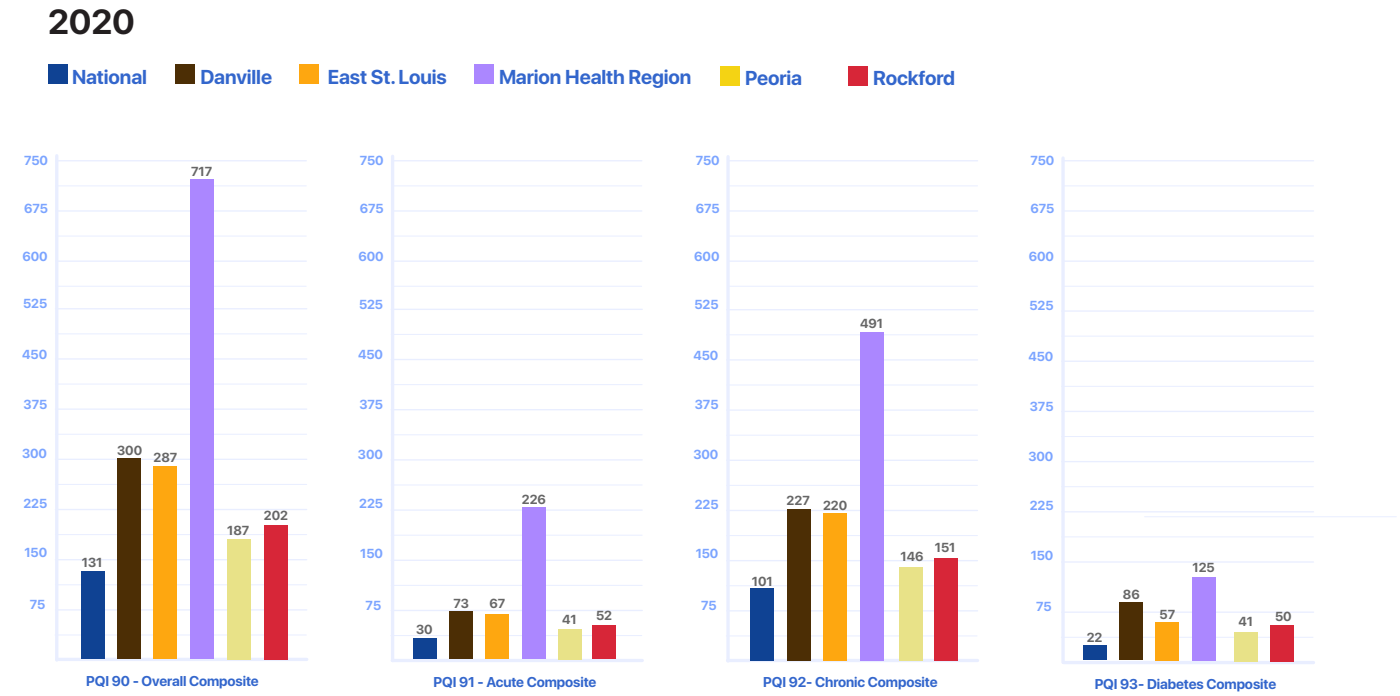


Table 3: Population Characteristics Associated with Composite PQIs in the Marion Health Region (FY2019 and FY2020 Data Combined)

Note: Variables highlighted in red are statistically associated with the PQI, meaning the odds ratio and the confidence level lower limit are ≥ 1 and the p-value is <0.05.

PQI 90_Overall Composite			Confidence Interval (95%)		
Group	**Compared To**	**Odds Ratio**	**Lower Limit**	**Upper Limit**	**P-Value**
AGE					
40-64	**18-39**	3.47	3.05	3.95	<.0001
65-74	**18-39**	5.80	5.00	6.73	<.0001
75 or older	**18-39**	6.42	5.51	7.49	<.0001
RACE					
AmerIN/AN	**White**	2.14	1.14	4.01	0.018
Asian/PI	**White**	0.79	0.33	1.88	0.59
Black	**White**	1.15	0.99	1.34	0.070
Other/UNK	**White**	0.85	0.63	1.14	0.27
SEX					
Male	**Female**	1.04	0.95	1.14	0.36

PQI 91_Acute Composite			Confidence Interval (95%)		
Group	**Compared To**	**Odds Ratio**	**Lower Limit**	**Upper Limit**	**P-Value**
AGE					
40-64	**18-39**	3.42	2.68	4.36	<.0001
65-74	**18-39**	6.59	5.07	8.58	<.0001
75 or older	**18-39**	9.78	7.57	12.64	<.0001
RACE					
AmerIN/AN	**White**	NR	NR	NR	NR
Asian/PI	**White**	0.73	0.17	3.05	0.66
Black	**White**	0.59	0.42	0.82	0.0017
Other/UNK	**White**	0.69	0.39	1.21	0.19
SEX					
Female	**Male**	1.25	1.07	1.46	0.0049

NR = Not reported due to small sample size/unstable estimate

Table 3 Continued

PQI 92_Chronic Composite			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	3.05	2.62	3.55	<.0001
65-74	18-39	4.18	3.50	5.00	<.0001
75 or older	18-39	3.57	2.94	4.32	<.0001
RACE					
AmerIN/AN	White	3.03	1.58	5.79	0.0009
Asian/PI	White	0.80	0.28	2.29	0.68
Black	White	1.41	1.18	1.69	0.0002
Other/UNK	White	0.93	0.66	1.30	0.67
SEX					
Male	Female	1.20	1.08	1.34	0.0007

PQI 93_Diabetes Composite			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	1.03	0.84	1.26	0.79
65-74	18-39	0.69	0.50	0.96	0.03
75 or older	18-39	0.31	0.19	0.52	<.0001
RACE					
AmerIN/AN	White	0.88	0.21	3.64	0.85
Asian/PI	White	1.53	0.36	6.39	0.56
Black	White	1.28	0.95	1.72	0.11
Other/UNK	White	0.88	0.52	1.50	0.64
SEX					
Male	Female	1.86	1.54	2.25	<.0001

In the tables above, AmerIN/AN = American Indian/American Native, Asian/PI = Asian/Pacific Islander, Other/UNK = Other/Unknown

Table 4: Population Characteristics Associated with Depression-Related Hospitalizations in the Marion Health Region (FY2019 and FY2020 Data Combined)

Note: Variables highlighted in red are statistically associated with the PQI, meaning the odds ratio and the confidence level lower limit are ≥ 1 and the p-value is <0.05.

DEPRESSION_Marion HR			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	1.37	1.12	1.67	<0.01
15 to 19.9	25 to 34.9	1.89	1.63	2.20	<0.001
20 to 24.9	25 to 34.9	1.13	0.97	1.35	0.11
35 to 44.9	25 to 34.9	0.93	0.80	1.07	0.3
45 to 64.9	25 to 34.9	0.61	0.53	0.70	<0.001
>65	25 to 34.9	0.47	0.38	0.57	<0.001
RACE					
AmericanIN/AN	White	1.6	0.87	2.95	0.13
Asian/PI	White	0.62	0.23	1.67	0.34
Black	White	0.67	0.56	0.80	<0.001
Other/Unknown	White	0.88	0.75	1.03	0.1
SEX					
Female	Male	0.97	0.88	1.06	0.48

Table 5: Population Characteristics Associated with Bipolar Disorder Hospitalizations in the Marion Health Region (FY2019 and FY2020 Data Combined)

Bipolar_Marion HR			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	0.61	0.38	0.05	<0.05
15 to 19.9	25 to 34.9	1.13	0.85	1.49	0.41
20 to 24.9	25 to 34.9	0.89	0.67	1.20	0.45
35 to 44.9	25 to 34.9	1.05	0.84	1.33	0.65
45 to 64.9	25 to 34.9	0.66	0.53	0.82	<0.001
>65	25 to 34.9	0.3	0.21	0.44	<0.001
RACE					
AmericanIN/AN	White	2.93	1.38	6.28	<0.01
Asian/PI	White	0.95	0.24	3.86	0.94
Black	White	0.59	0.43	0.82	<0.01
Other/Unknown	White	0.56	0.40		<0.01
SEX					
Female	Male	0.91	0.77	1.06	0.21

In the tables above, AmericanIN/AN = American Indian/American Native, Asian/PI = Asian/Pacific Islander, Other/UNK = Other/Unknown

Table 6: Population Characteristics Associated with Alcohol Use Disorder Hospitalizations in the Marion Health Region (FY2019 and FY2020 Data Combined)

Note: Variables highlighted in red are statistically associated with the PQI, meaning the odds ratio and the confidence level lower limit are ≥ 1 and the p-value is <0.05.

AUD_Marion HR			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	0	0.00	INF	0.93
15 to 19.9	25 to 34.9	0.28	0.17	0.48	<0.001
20 to 24.9	25 to 34.9	0.56	0.37	0.85	<0.01
35 to 44.9	25 to 34.9	1.29	1.00	1.67	0.05
45 to 64.9	25 to 34.9	1.05	0.83	1.33	0.67
>65	25 to 34.9	0.23	0.14	0.39	0.99
RACE					
AmericanIN/AN	White	3.48	1.62	7.49	<0.01
Asian/PI	White	0	0.00	INF	0.98
Black	White	0.93	0.68	1.26	0.64
Other/Unknown	White	0.99	0.67	1.47	0.97
SEX					
Female	Male	0.39	0.32	0.47	<0.001

Table 7: Population Characteristics Associated with Opioid Use Disorder Hospitalizations in the Marion Health Region (FY2019 and FY2020 Data Combined)

OUD_Marion HR			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	0	0.00	INF	0.98
15 to 19.9	25 to 34.9	0.036	0.00	0.26	<0.001
20 to 24.9	25 to 34.9	0.38	0.20	0.75	<0.01
35 to 44.9	25 to 34.9	1.07	0.73	1.55	0.73
45 to 64.9	25 to 34.9	0.43	0.29	0.65	<0.001
>65	25 to 34.9	0.025	0.00	0.18	<0.001
RACE					
AmericanIN/AN	White	1.47	0.20	10.57	0.7
Asian/PI	White	0	0.00	INF	0.99
Black	White	0.92	0.55	1.54	0.74
Other/Unknown	White	0.72	0.31	1.64	0.43
SEX					
Female	Male	0.55	0.40	0.75	<0.001

In the tables above, AmericanIN/AN = American Indian/American Native, Asian/PI = Asian/Pacific Islander, Other/UNK = Other/Unknown, AUD = Alcohol Use Disorder, and OUD = Opioid Use Disorder

Alena Mozhjer - https://www.istockphoto.com/photo/aerial-view-of-american-midwestern-farm-corn-field-at-harvesting-season-gm1271196311-373875106

3: Engaged community members from socially vulnerable areas in conversations and identified barriers to outpatient care, disease prevention, and treatment adherence

The findings presented in this report up to this point demonstrate a lack of access to outpatient care for the most frequent and resource-intensive conditions. Recognizing that healthcare data can reveal what is happening but not explain why, a parallel qualitative study was conducted to understand people's lived experience of the healthcare system.

NAACP – Carbondale Branch

The mission of the National Association for the Advancement of Colored People is to ensure the political, educational, social, and economic equality of rights of all persons and to eliminate racial hatred and racial discrimination.

Participant Demographics:

1 Townhall conducted on April 15, 2022 with 26 total participants (townhall conducted in English)

Age:

18-35	0 Participants
36-55	2 Participant
56-65	9 Participants
66-75	12 Participants
76+	3 Participants

Gender:

Female	13 Participants
Male	13 Participants
Other	0 Participants

Race/Ethnicity:

Black	26 Participants
Other	0 Participants

Zip Codes:

62901	15 Participants
62864	5 Participants
62801	5 Participants
62921	1 Participant

Insurance:

Private Insurance	6 Participants
Medicaid	7 Participants
Medicare	9 Participants
Unspecified	4 Participant

To understand the experiences of residents of the Marion Health Region, a research team from Southern Illinois University's School of Medicine partnered with the Carbondale Branch of the NAACP to host a community townhall with residents living and working in zip codes with a high social vulnerability index score in the region: 69201, 62801, 62901, 62864, and 62921. (See Appendix C for information about how zip codes were identified.) 26 residents of the Marion Health Region (MHR) participated in the community townhall held on April 15, 2022.

Residents engaged in semi-structured discussions designed to elicit open-ended thoughts, stories, and reflections about 4 main topics:

- the top health issues affecting MHR communities
- participants' own experiences (or those of loved ones) with recognizing healthcare needs and seeking care at local providers
- health resources available in the community
- participant recommendations for a healthier MHR

The Carbondale Branch of the NAACP both recruited participants through its local network of members and facilitated the session. Consequently, the findings presented here particularly reflect the experiences of the Black population served by the NAACP. See the sidebar for the mission statement of the NAACP and for tallies of participant demographics.

During the community-input sessions, community members shared detailed accounts of issues they face related to healthcare access, which is the ability to seek, approach, and fully utilize healthcare. This broad theme encompasses aspects of access such as the availability, affordability, and acceptability of healthcare services. These elements of healthcare access are de-

fined as follows (25):

Availability refers to the existence of or number of healthcare providers that serve an area broadly or for a particular health need or concern, the timeliness of getting those healthcare services, the distance of those services from community members' homes, and access to the transportation required to attain needed care.

Affordability refers to presumed and actual healthcare-related costs. These include co-payments, bills, and indirect costs related to getting healthcare.

Acceptability relates to the appropriateness of services that are provided for a particular need and the actual or perceived quality of the health services received.

Community members shared detailed accounts of the challenges they faced, or loved ones faced, in accessing care, as well as critical **social determinants of health** underlying the challenges to health and well-being in the MHR.

"Sometimes there's a lack of services here, and we have to drive a distance to get what we need."
Reginald, 67, on travel burden to access care in the MHR

Availability

Participants often experienced an insufficient supply of health services in the MHR. While services do exist, it's challenging for them to find care—especially specialized care—in the region. Many have had to travel far to receive care for themselves or their loved ones, as Reginald, a 67-year-old man with Medicare, experienced:

> *"One of the biggest things is making sure that we have the resources in this community, rather than having to go to St. Louis. Sometimes there's a lack of services here, and we have to drive a distance to get what we need. That's the biggest thing that we have to deal with."*

Note:
All focus group participants adopted an pseudonym during the session and quotations are attributed to the pseudonym.

"In Carbondale, Illinois, there's maybe one facility that takes the medical card [Medicaid] for kids. But that facility doesn't have any slots for children."

Marcy, 58, on lack of availability of dental services for childre

"We need to have [resources] in every community to deal with mental health issues."

William, 59, on the need for expanded mental health services in the region

Participants cited two particular healthcare service deficits in the MHR: pediatric dental care and mental healthcare services.

The insufficient supply of pediatric dental care for makes it incredibly hard for parents to get services. Marcy, a 58-year-old woman with Medicaid, explained the difficulty of getting one of a limited number of time slots for her children to be seen by a dentist:

> *"In Carbondale, Illinois, there's maybe one facility that takes the medical card [Medicaid] for kids. But that facility doesn't have any slots for children. They are are covered, but there's no slots. Then, [when they do get treated,] they don't get treated adequately. . . . I'm tired of our kids having to be seen by dental students."*

(Note: Townhall participants did not identify the *availability* of adult oral health services as an issue. However, they did cite the *affordability* of those services as an issue.)

Mental health services are in limited supply around the region, with demand clearly exceeding supply. At least three participants identified mental health as a critical healthcare issue facing communities in the MHR. In fact, William, a 59-year-old man with private insurance, advocated for widespread mental health services in the MHR:

> *"We need to have [resources] in every community to deal with mental health issues."*

Mental health services targeted to the homeless population is particularly important, as Tevin, a 62-year-old man with Medicaid, points out:

> *"Among the homeless, [the] number one [biggest issue] is mental health."*

"In regards to mental health, one thing that would be good for the community is to have a list of all the facilities that are available and the services they provide."
Mayra, 41, on the need for better dissemination of information about mental services available in the MHR

Access to already limited services is impacted by a lack of information that is communicated by helathcare systems, nonprofit agencies and other organizations to the general public. This lack of information, is especially true for mental healthcare services. Mayra, a 41-year-old woman with private insurance, recommended someway to provide community residents a central, updated list :

> *"In regards to mental health, one thing that would be good for the community is to have a list of all of the facilities that are available and the services that they provide . . . for the southern Illinois area, [because if] you're coming to Carbondale from Mount Vernon, you don't want to get here and find out the services aren't offered."*

Affordability

Affordability of healthcare, even for those with medical insurance, was a topic addressed by many of the participants. As previously mentioned, the MHR is an impoverished area where many struggle to keep their lights on and are without basic resources. One of the primary reasons community members do not get the healthcare they need is because they cannot afford it, as Alice, a 61-year-old woman (unspecified insurance), explained:

> *"In my community, there's little or no insurance. For those that do have insurance, when they go to see their doctor, the co-pay is like $40. Not everybody has $40. The way things are going up, it's difficult just to get there [to a doctor] once. Then the doctors tend to schedule you for more than one appointment, and each time they want money."*

"For those that do have insurance, when they go to see their doctor, the co-pay is like $40. Not everybody has $40."
Alice, 61, on challenges to affording care

Phoebe, a 71-year-old woman (unspecified insurance), described the catch-22 of being

unable to afford absolutely necessary care:

> *"We had to have an IV [intravenous] port put into my husband, and I'm doing it at home. But the cost is $385 a week just for [the antibiotics]. I can't afford it, but he has to have it."*

Daphne, a 56-year-old woman with Medicaid, discussed a similiar experience with the cost of antibiotics for a critically-ill family member:

> *"Intravenous antibiotics cost $3,000 per [dose] and we needed 3 or 4 antibiotics [doses] a day. And [then], the social worker is constantly hounding you about your insurance or how you're going to pay for it.*

Townhall participants also cited adult dental care services being unaffordable as well.

"Intravenous antibiotics cost $3,000 per [dose] and we needed 3 to 4 [doses] a day."
Daphne, 56, on the high cost of healthcare

Acceptability

Acceptability is about people's experience and perception of the appropriateness and quality of received healthcare services. One important condition for the provision of appropriate, quality care is trusted patient-provider relationships. During the townhall, participants' descriptions of their experiences with healthcare providers varied. Some had positive experiences. For example, Bobbi, a 53-year-old woman with Medicaid, vividly described her experience of a life-saving intervention by a resident physician:

> *"I went to urgent care. . . . My blood pressure was extremely high—they couldn't believe that I actually drove to the urgent care myself. They insisted it was stroke level and that I take an ambulance to the ER in Carbondale. I had lots of tests done there. I was discharged with some high-blood-pressure medicines that I needed to start taking. . . .Two weeks later, I went*

in for a follow up visit. My blood pressure was still extremely high . . . and this person just said, 'Continue to take your medicine, but I want to see you in a week because I'm not sure what's going on.' She was actually a resident. . . . but she saved my life because, as I was leaving her office and walking to my car, she actually ran down to get me . . . because of what she saw in the medical records from the ER that I had gone to 2 weeks before . . . She said, 'You're in renal failure. You're going to have to have emergency dialysis tonight.'"

Other participants had questionable experiences that left them dissatisfied with the care they received and mistrustful of providers. These participants experienced providers who were dismissive, discriminatory, or who provided misguided care. For example, Marcy, a 58-year-old woman with Medicaid, had this to say about her experience:

"What bothers me the most is the issue with Black women not being taken seriously. . . ."
Marcy, 58, on being treated dismissively by healthcare providers

"What bothers me most is the issue with Black women not being taken seriously and having to [always] advocate to make [healthcare providers] do what they need to do."

Tevin, a 62-year-old man with Medicaid, related his experience of being dismissed in the emergency room:

"You know, I'm there for care, I'm in a lot of pain, and I was told to quit moaning."
Tevin, 62, on being treated dismissively by a healthcare provider

"I went to the ER here in town. I had a severe headache, and I was moaning, and the nurse told me to quit moaning. . . . Every time I think about that I get upset. You know, I'm there for care, I'm in a lot of pain, and I was told to quit moaning."

Bethanne, a 68-year-old woman with Medicaid, described her experience with her primary care physician, saying:

"When I go in to see my primary doctor, she acts like she's scared to get close to me."
Bethanne, Jack of Spades, XX, on poor patient-provider interactions

"When I go in to see my primary doctor, she acts like she's scared to get close to me."

William, a 59-year-old man with private insurance, described his experience of receiving misguided care from a doctor:

"I was prescribed two blood-pressure medications. The doctor told me they were low dose and not going to [have any negative side effects]. Fast forward, I got a different—actually, a physician assistant, a Black woman. She was reading the medicines I'm taking, she says, 'Are you still taking X and Y?' And I say, 'Yeah, I take it every day.' She's like, 'That's not a blood-pressure [medication] for a Black man. You need to stop taking it right away.' I had no clue whatsoever. My wife looked it up [online] and found that there was a mortality rate link with that particular medicine. So it's kind of surprising that I was given that medicine by another doctor."

Participants also had experiences with insurance companies denying care recommended by doctors, adding to their frustration of not getting appropriate care, as Randy, a 67-year-old man with Medicare, explained:

"The doctor makes recommendations sometimes. But the insurance company will deny something that your doctor is recommending. So, we have to be aware that the insurance companies are controlling our healthcare."

For townhall participants, more acceptable care in the MHR means more Black representation among healthcare providers. Participants stressed their desire to see more healthcare providers who look like them and who could offer more empathetic, higher quality, care. For instance, Bobbi, a 53-year-old woman with Medic-

"We need Black healthcare providers who can relate to what we go through—Black doctors, Black dentists, and Black therapists for Black people."

Bobbi, 53, on the desire for more Black representation in healthcare

aid, said:

> *"What would benefit us greatly in this area is a healthcare facility that is run by us that is for us. . . . We need Black healthcare providers who can relate to what we go through—Black doctors, Black dentists, and Black therapists for Black people. . . . We'd trust what they say."*

Poor patient-provider interactions, insurance rules, and the lack of Black representation among providers in the MHR has led to mistrust and suspicion, undercutting the quality of healthcare and discouraging participants' willingness to engage with the healthcare system.

Social Determinants of Health (SDOH)

People living and working in the MHR experience several SDOH factors that greatly affect their quality of life. During the townhall, participants discussed two important ones impacting the MHR: poverty (exacerbated by a lack of services due to budget cuts) and racism. Both of these issues are barriers to staying healthy and seeking care and discussion of these interrelated influences were threaded throughout the townhall.

Participants stressed that poverty is the most critical issue in the MHR, as Allen, a 56-year-old man with Medicaid, explained:

> *"We're a poverty-stricken town. High rates of poverty—very poor people, a lot of poor people. . . . Our biggest problem is poverty.*

Many people in the MHR do not have the resources at home to meet a basic standard of life. Alice, a 61-year-old woman (unspecified insurance), highlighted the issue, saying:

> *"There's [an issue with] housing. Many of the trailer homes out there do not have*

"Many of the trailer homes out there do not have proper heating or lights."
Alice, 61, on lack of basic needs in the MHR

". . . we used to have Southern Illinois Regional Social Services—SRSS—which helped mental patients . . ."
William, 59, on budget cuts to social services in the MHR

proper heating or lights. They're missing things that should be expected for everyone to have."

Due to this poverty, the region struggles with homelessness, as Tevin, a 62-year-old man with Medicaid, stated:

"Something I am concerned about in my community is homelessness. [It's] number one . . . in terms of importance."

In the past, more services existed that could help struggling residents. However, the MHR has felt the burden of state budget cuts—something the region, as a rural area, could not afford. In fact, resources were already scarce before the cuts. William, a 59-year-old man with private insurance, recalled:

"Before the budget cuts, we used to have Southern Illinois Regional Social Services—SRSS—which helped mental patients around the corner. It not only helped them with mental issues, but it also . . . gave them services to help them get a place to live, a place to [get] cleaned [up], and someone to help show them how to organize their home and [other] stuff. If the money was there, we'd have SRSS in every community to deal with mental issues."

Racism is another SDOH that multiple MHR participants raised, with particular emphasis on the tendency of Black men to avoid seeking care until too late. For example, Brent, a 73-year-old man with Medicare, discussed how Black men he knows are often hesitant to seek healthcare and how detrimental this can be to their well-being:

"Another thing is Black men . . . have a hard time going to the doctor. Me, myself, I don't have that problem. I'll go to the doctor

because of a toothache [laughter]. . . . It's just the knowledge that men should be aware of different signs if they're having some type of health issues. . . . They see something one time and . . . they don't get it checked out. Then, next thing you know, it's back with a vengeance. I've had a bunch of friends that did that, and when they finally got diagnosed, it was too late."

This tendency of Black men to avoid seeking healthcare is likely related to a history of unethical medical practices involving Black men, a lack of Black representation among healthcare providers as well as experiences of discrimination at the point of service, as discussed in the section "Healthcare Quality in the MHR."

"Another thing is Black men . . . have a hard time going to the doctor."
Brent, 73, on Black men's hesitantantcy to visit the doctor

Conclusion

Throughout the townhall, community members described the challenges related to seeking and receiving healthcare in the MHR. Participants felt SDOH factors such as poverty, elimination or reduction of services due to budget cuts, and racism all played negative roles. Issues with access to care were frequently expressed, as participants pointed out the difficulty of finding out about existing resources, getting care in a timely manner, and traveling outside the area for care. Furthermore, they voiced their concerns about unaffordable costs and a lack of Black representation among healthcare providers.

The topic of race came up frequently in the group, particularly as it pertained to the quality of their care and their mistrust of providers. Several participants said their race made a difference in the care they received, and they felt without a voice when it comes to advocating for their health.

To address healthcare inequities in their com-

munities, the participants recommended the creation of one-stop healthcare facilities near their homes and raising community awareness of services. They indicated that investment in Black doctors, dentists, and therapists practicing in the region would improve the quality of care as well as help those in the Black community feel heard, empowered, and comfortable with healthcare.

4: Synthesized findings from the data analyses and the community conversations to define transformation opportunities for stimulating outpatient care access and reducing the social barriers to care and treatment

What emerges from the combination of the analysis of hospital utilization data and the inventory of concerns expressed by residents in community conversations is strong indication of the need to improve accessibility to local trusted and affordable physical, behavioral and dental healthcare and, in parallel, address the social-determinant-of-health barriers (poverty, community disinvestment, and racism) that make it more difficult for residents of the MHR to stay healthy, prevent disease, access care, and adhere to treatment. Doing so will require healthcare systems in the MHR to reach out beyond the walls of their hospitals and into communities. It will also require community residents and organizations in the MHR to become more engaged in health and healthcare. In other words, the effort will entail finding a middle ground where healthcare systems and communities work together to address community needs and improve healthcare engagement.

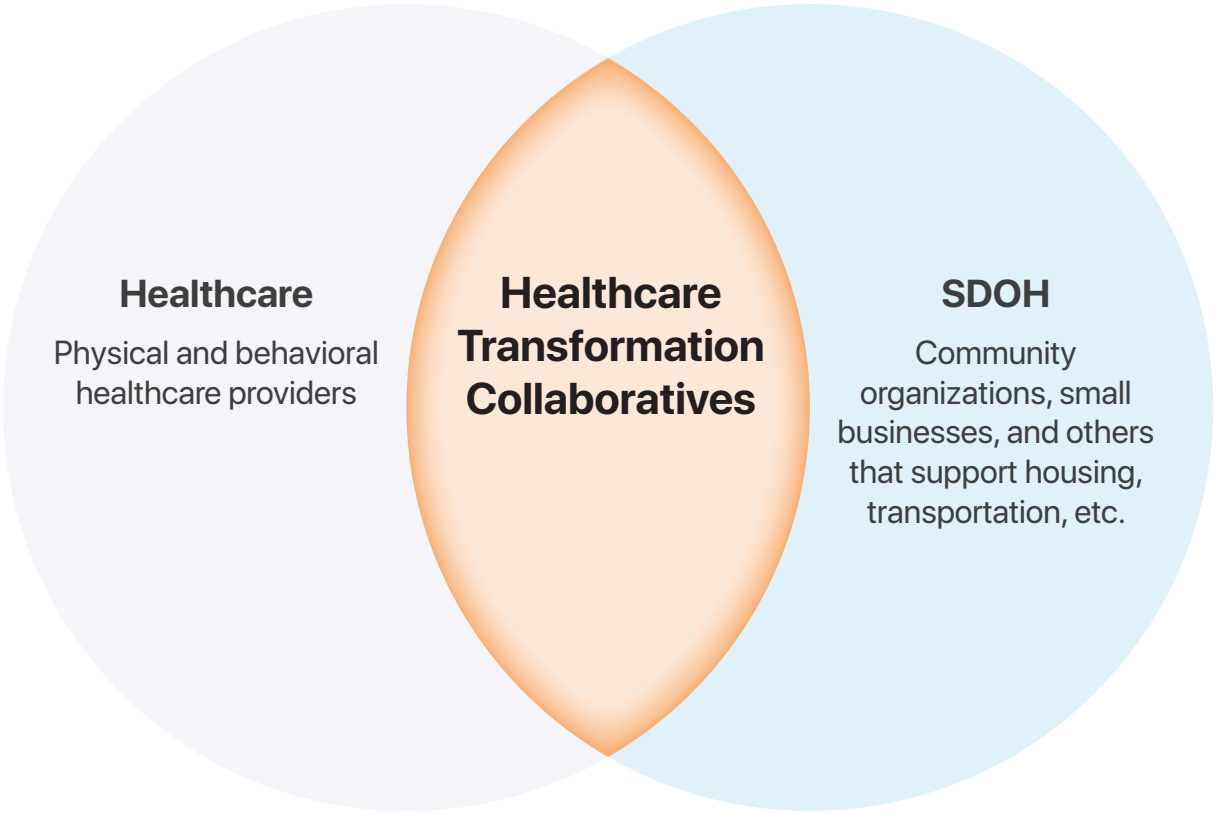
To this end, the combined analysis suggests that transformation efforts need to concentrate on *clinic-community linkages* that provide primary and secondary care and community-based wraparound services to help people manage chronic illnesses, mental illnesses, and substance use disorders. Clinic-community linkages leverage the treatment expertise of healthcare systems, the on-the-ground knowledge of community-based organizations, and the trust that residents have in those organizations to support an active approach to chronic disease management, restore trust in the healthcare system in socially vulnerable communities, and increase engagement in healthcare.

More specifically, clinic-community initiatives should be guided by the following objectives:

1. *Incentivize clinic-community linkages* in order to address physical health, behavioral health, and social needs in a coordinated, accessible fashion within communities.
2. *Promote collaborative care models* for chronic illnesses, including mental illnesses and substance use disorders (for example, health homes and coordinated care models).
3. *Build capacity* for clinic-community linkages and collaborative, relationship-based care models.
4. *Promote care engagement* via awareness of services and navigation support.
5. *Continuously groom clinic-community linkage services* to reduce and eliminate barriers to care.

HFS' Healthcare Transformation Collaboratives project is designed to incentivize these clinic-community linkages (see Figure 12). Over time, investments in these linkages will address the need for access to services where people live, work, and play and, ultimately, will help drive greater health in communities.

Figure 12


Healthcare
Physical and behavioral healthcare providers
Healthcare Transformation Collaboratives
SDOH
Community organizations, small businesses, and others that support housing, transportation, etc.

Limitations and Opportunities for Future Research

The analyses in this report demonstrate an imperative need to expand access to outpatient care and, in parallel, reduce the barriers to that care (that is, address the social determinants that make it difficult to access that care), in particular for bipolar disorders, depressive disorders, substance use disorders, and key ACSCs (hypertension, diabetes, asthma/COPD, and heart disease). However, some limitations related to the data and community input affected the execution of this research, and these limitations are described in this section.

Data Limitations

Limited Variables Available in Noninstitutional Data

The data obtained under the data-use agreement (see Appendix A) includes:

- institutional data that consists of inpatient admissions, outpatient visits, and ED visits in hospital/medical center systems
- noninstitutional data that consists of outpatient visits to independent healthcare providers
- a recipient data file that contains date of birth, sex, race, and zip code information for Medicaid enrollees in each study area

The lack of specificity in the noninstitutional data impaired what analysis could achieve. For example, providers are classified broadly as "physicians" or "nurse practitioners" with no further specialty-based classifications available in the data. Also, some provider addresses are billing addresses, which may differ from service-providing addresses. Although some addresses were confirmed as service-providing ones, others could not be verified. In upcoming years, HFS is scheduled to move to an improved and expanded database that will contain deeper data on provider types, locations, and diagnoses. Improved data will allow more detailed analyses of outpatient utilization trends and the relationship between hospital-level care and outpatient utilization.

In addition, technical issues related to file size and other delays prevented analysis of FY2019 and FY2020 noninstitutional data for compiling updated figures for outpatient care before and after hospitalization for mental disorders, substance use disorders, and ACSCs.

Limited Patient-Level Demographic Data

The Medicaid institutional data set contains patient-level healthcare encounter data. For each encounter, the data contain the following key fields: the patient's unique recipientID code, the patient's admission and discharge dates, diagnosis (ICD-10 code), and whether the encounter was for an ED visit, an inpatient hospital admission, renal

visit, or an outpatient service encounter. In a related recipient table, joined by the "recipientID" code, the data contained the following fields for each patient: date of birth, sex, race, and zip code. The data on race is limited because the collection of race data is not required. As a result, race is listed as "unknown" in approximately 20% of the records. In addition, segmentation and analysis by ethnicity was not possible since information on ethnicity is not in the data. Detailed patient-level data would allow analyses to better determine those patient populations most closely associated with negative outcomes and help inform targeted interventions.

Need for Patient-Level Social-Determinant-of-Health Data

The absence of patient-level information on social, cultural, and economic characteristics, health-related behaviors, and other social-determinant-of-health characteristics is another constraint. Its absence limits understanding how specific aspects of the patient's lived experience drive the observed health outcomes. Associating patient-level utilization and other health outcome data with patient-level social-determinant-of-health factors would provide insight into what specific factors drive negative (and positive) health outcomes and where to focus interventions. It is recommended that the State of Illinois invest in mechanisms that allow the association of patient-level Medicaid utilization data with patient-level social-determinant-of-health data.

Need for Hyper-Local Neighborhood Social-Determinant-of-Health Data

Local neighborhood data on social determinants of health would help contextualize patient-level healthcare utilization and health outcomes and provide insight into structural barriers to good health and health-related quality of life. Having such hyper-local data would strengthen the State's ability to identify social-determinant-of-health drivers of disparities in healthcare utilization and inequities in health outcomes across populations. It is recommended that the State invest in mechanisms that allow the association of hyper-local social-determinant-of-health data with patient-level utilization and health outcome data.

Need for Patient-Level Comorbidity Data

Information on the presence of other health conditions at the time of a clinical encounter would help take case mix into account when comparing patients and patient populations with respect to healthcare utilization and health outcomes. Limitations in data access to secondary diagnoses prevented analyses related to comorbidities.

Lack of Maternal-Child Health Outcomes Assessment

This report does not assess maternal-child health outcomes, which are known to be disparate in Illinois and a priority for HFS. Using HFS-provided data, a preliminary analysis of key adverse pregnancy outcomes (such as stillbirth and premature birth) was conducted. However, analyses were thwarted by important data limitations:

- There's no infant-to-mother record linkage in the data. The lack of linkage from infant-to-mother records presented the additional challenge of determining an appropriate denominator for birth outcomes (for example, the total number of births).
- Prenatal care visits were not identifiable in the provided outpatient data. This meant that even if rates of adverse maternal-

child health outcomes could have been estimated, it would still not have been possible to trace associations of these outcomes back to inadequate prenatal care.

The effects of these data limitations were such that attempts to assess rates of premature birth and stillbirths across these study areas yielded implausibly low numbers of adverse events and rates that were orders of magnitude lower than published national rates. The data team was unable to ascertain whether these estimates had been distorted by missing data, coding errors, or other data problems in the count of adverse outcomes or total births. In the end, these data concerns led to the decision to not include analyses of maternal-child health in this report. With enhanced data sets and a methodology for connecting mother with babies in the data, a future assessment of poor outcomes in pregnancy, and with newborns, could be done.

Unavailability of Hospitalization Data by Insurance Status for PQI Comparison Rates

We analyzed Medicaid utilization data for ACSCs as an indicator of healthcare delivery gaps in selected study areas. For ACSC PQIs, we compared study area PQI rates for Medicaid enrollee hospitalizations with national PQI rates for the general population. This analysis was informative and indicative of healthcare delivery gaps in the study areas. However, additional benchmarks are needed for comparison—specifically, national PQI rates for Medicaid recipients, Illinois PQI rates, and Illinois Medicaid PQI rates.

Despite the data and community-input limitations explained here, there are meaningful and conclusive analyses in this report that highlight very important issues. Furthermore, the analyses contained in this report can serve as benchmarks for measuring outcomes of transformation interventions. These benchmarks can also be used to assess the impact wrought by COVID-19, hospital closures, and other changes in healthcare delivery systems.

Opportunities for Future Research

Appendices

Appendix A:
Approach to Analyzing Medicaid Utilization Data

About Medicaid Utilization Data

The team tasked with updating data analyses from the report published in February 2021 focused on FY2019-2020 Medicaid patient-level utilization data. Patient-level utilization data was obtained from the Illinois Department of Healthcare and Family Service (HFS) under a data-use agreement (DUA) executed jointly by HFS and University of Illinois Chicago (UIC) legal counsels. Data was stored in a secure server. To further protect the data, access to that server was limited to a small number of selected members of the research team, each of whom completed required security training. Information flow in and out of the server was further severely restricted by IT technology.

Under the DUA, the team received 3 data sets: institutional data, noninstitutional data, and a "recipient file."

Institutional Utilization Data (FY2019 and FY2020)
This data set contained Medicaid recipients' healthcare encounters (inpatient admissions, outpatient visits, and emergency department [ED] visits) at hospital/medical center systems. Key fields in this data set included the following:

- hospital system provider name (system in which the healthcare encounter occurred)
- zip code of hospital system provider (where the healthcare encounter occurred)
- recipient ID (unique Medicaid recipient code)
- recipient zip code (indicating home address of recipient)
- service type (inpatient, outpatient, or renal)
- ER indication (indicates if the encounter is a visit to the emergency room of the institution; variables for this are "ER visit" and "other")
- admission and discharge dates
- ICD-10 code and description (principal diagnosis for the encounter)
- diagnosis related group (DRG) code

Noninstitutional Utilization Data
(FY2018 only; data for FY2019 and FY2020 not available due to file size)
The noninstitutional data contained Medicaid recipients' outpatient visits to independent healthcare providers. Key fields in this data set included the following:

- provider type and description
- category of service and description
- provider zip code
- recipient ID (unique Medicaid recipient code)
- recipient zip code (indicating home address of recipient)

- behavioral health indication (indicates if the encounter is for behavioral healthcare)
- service date
- ICD-10 code and description (principal diagnosis for the encounter)

Recipient File Data
This data set contained sex, date of birth, and race data for unique recipient IDs. A couple of notes about recipient data:

- Race data does not include ethnicity, so mentions of "white" as race include Latinx.
- Age at time of encounter was derived from recipient date of birth.

The FY2019 and FY2020 institutional data file and recipient file represent all inpatient hospitalization encounters in these fiscal years for all Medicaid recipients living in the zip codes of the areas defined in this study (specifically, all recipients with home zip codes within the study areas)—in other words, the data track inpatient hospital utilization by Medicaid recipients living in the study areas, regardless of where that care took place.

Approach to Medicaid Utilization Data Analysis

Non-Prescriptive Approach to Data Analysis

At no point during this research did HFS direct an analytic framework that the UIC team should follow, or identify questions or hypotheses the research team must pursue. The research team worked in complete independence and reported results and findings to HFS as they became available.

Data-First, Data-Driven Analysis Approach

Most analyses are hypotheses driven, in the sense that they begin with specific questions and hypotheses and then analyses are framed broadly to address those questions. In contrast, this project was predominantly data driven. The team approached the data analytics in this project with no previously formed hypothesis. Using this "data-first" (rather than question-first) approach, the team let the data analytics bring up the questions and topics of interest. The team then used further data analytics to gain insight into these questions and topics. It bears noting that the statistical results reported here are mostly descriptive rather than inferential.

Analytics Approach: Descriptive Statistics, Bivariate Associations, and Logistic Regressions

Descriptive statistics is the primary analytics approach used for this study. Aggregated summaries provided in this report are expressed as percentages, rates, averages, medians, and such. For example, since the data may include multiple encounters for one Medicaid recipient (for example, multiple visits to a healthcare provider, ED visits, and/or inpatient hospital stays) for one health condition, a numerator for the rate could be the number of encounters (which counts multiple encounters of a single patient) or the number of unique recipients. Similarly, the denominator to calculate the rate could be the overall population in the region or the number of Medicaid enrollees in the region. Each such calculation in the analyses was done after careful consideration of all these aspects by subject-area scholars.

Descriptive statistics: After getting to know the data sets by reviewing the fields and variables, running histograms of variables, and doing basic data cleaning and new data creation (for example, patient age at time of the patient encounter), the data analytics team produced an initial set of descriptive statistics. For the institutional data set, initial analyses included looking at the distribution of demographic data and the distribution of healthcare encounters by hospitals. Figures 13 to 19 exhibit the charts for the following analyses:

- for inpatient hospitalizations, distribution of ages, sex, and races of patients by study area (excluding Chapter 21 data)
- for ED visits, distribution of ages, sex, and races of patients by study area (excluding Chapter 21 data)
- market share of hospitals receiving Medicaid patients by study area

Other descriptive statistics, such as frequency distributions of disease chapters and blocks, are found in the "Detailed Findings" section of this report.

Bivariate associations: The data analytics team also investigated bivariate associations, such as associations between health conditions (that is, principal diagnosis codes represented by chapter, block, or ICD-10 code) and localities (zip codes and study areas). More specifically, the team compared rates, percentages, averages, and medians across zip codes, age groups, race and study areas. Included in the "Detailed Findings" section of this report are the key bivariate associations that drove insights about the utilization data: inpatient admission diagnosis blocks by resource intensiveness defined by hospital readmission.

Logistic regressions: The data analytics team also performed a limited set of advanced inferential statistical analysis using bivariable and multivariable regression analyses. Regression analyses were used to understand Medicaid patients' demographic characteristics most associated with diseases of interest: bipolar and depressive disorders, and alcohol and opioid use disorders, and ACSCs. This task required first singling out those patients with a principal diagnosis of the key disease groups and conditions (1 vs. 0) in the utilization data for any type of encounter (inpatient hospitalization, ED visit, or outpatient visit). For example, if a patient had at least one depressive disorder diagnosis, the outcome variable for the depressive disorder was flagged as 1. If the patient had 2 or more depressive disorder diagnoses, the outcome of the depressive disorder was still flagged as 1. The same process was followed for the other key diseases. Patients with multiple diagnoses were included in more than one logistic regression. For example, if a patient had both a bipolar and a depressive disorder diagnosis, that patient was included in logistic regressions for both conditions. The covariate for the logistic regression included the demographic covariates available in the data, these being age, race, and sex.

See Appendix B, “Additional Analyses for Selected Disease Groups and Conditions," for tables containing the results of the logistic regressions for bipolar and depressive disorders, and alcohol and opioid use disorders, and ACSCs.

Figure 13: Inpatient Hospitalizations—Distribution of Ages of Patients by Study Area

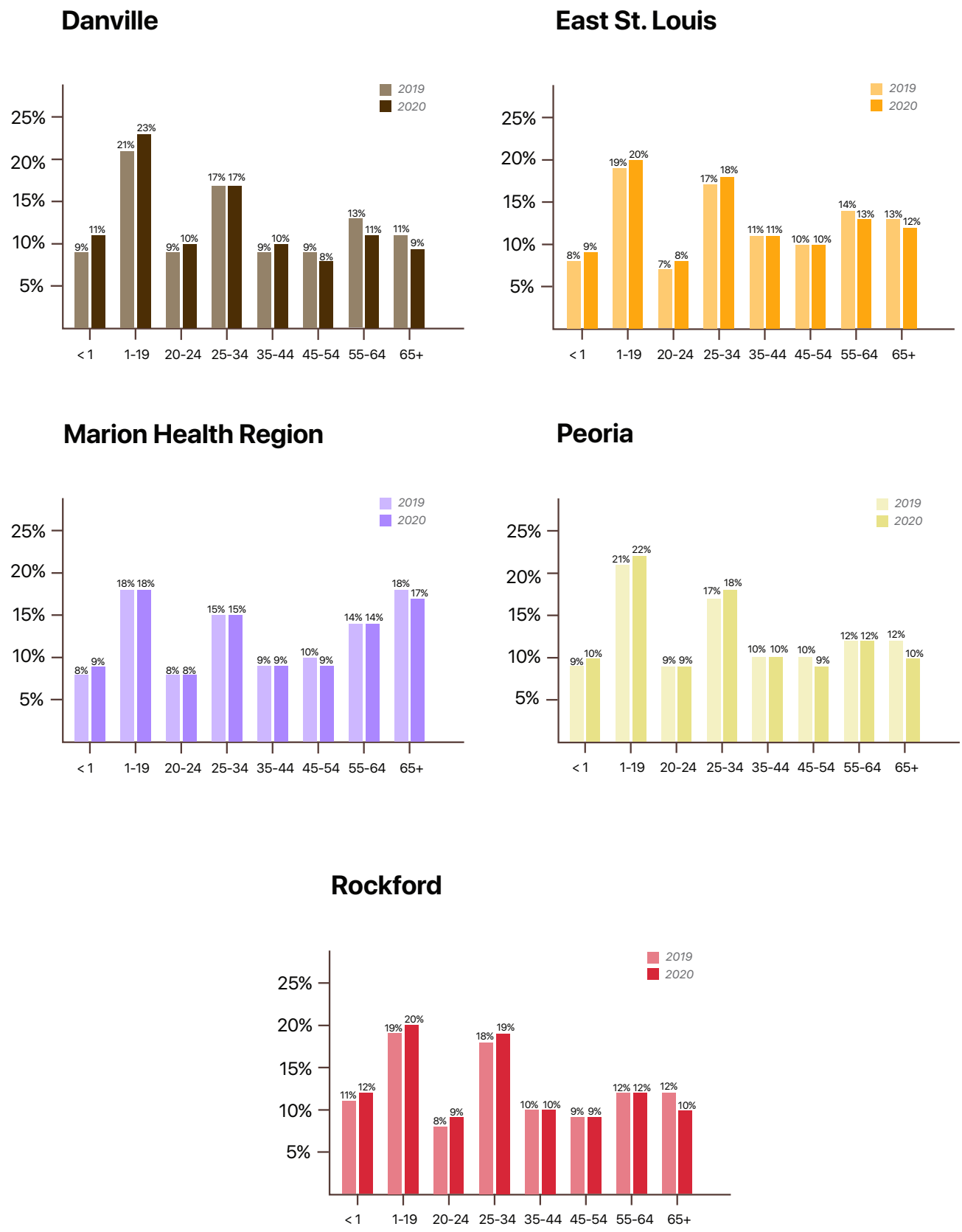
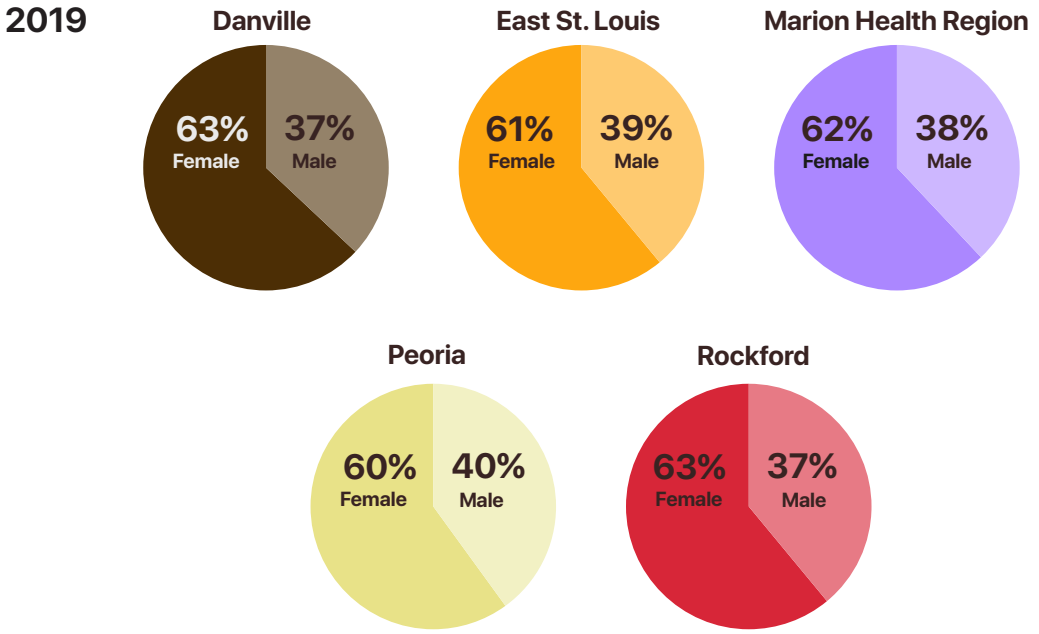


Figure 14: Inpatient Hospitalizations—Distribution of Sex of Patients by Study Area



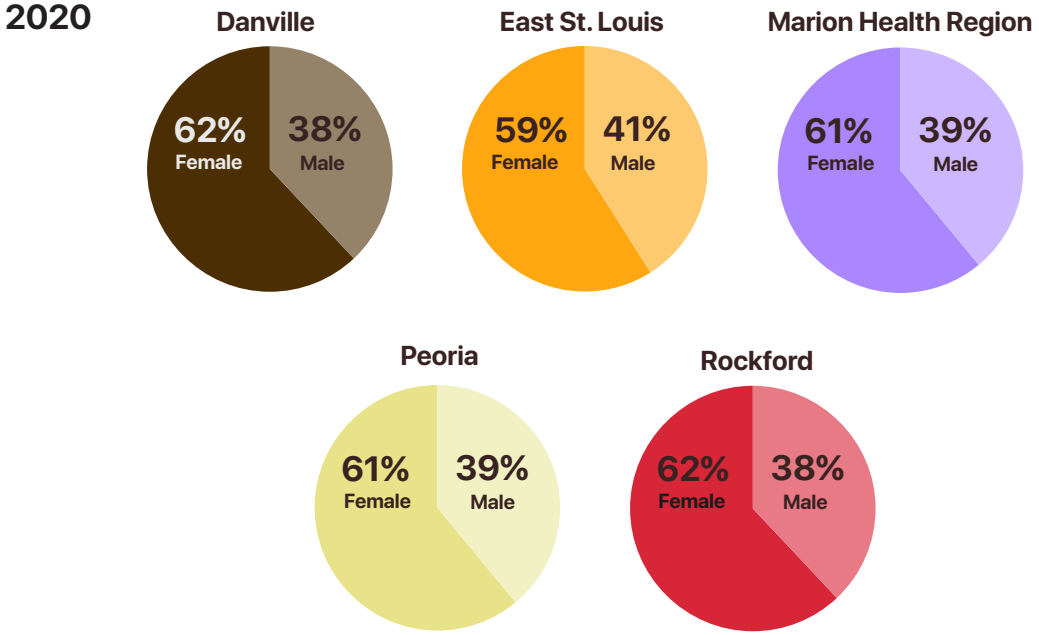
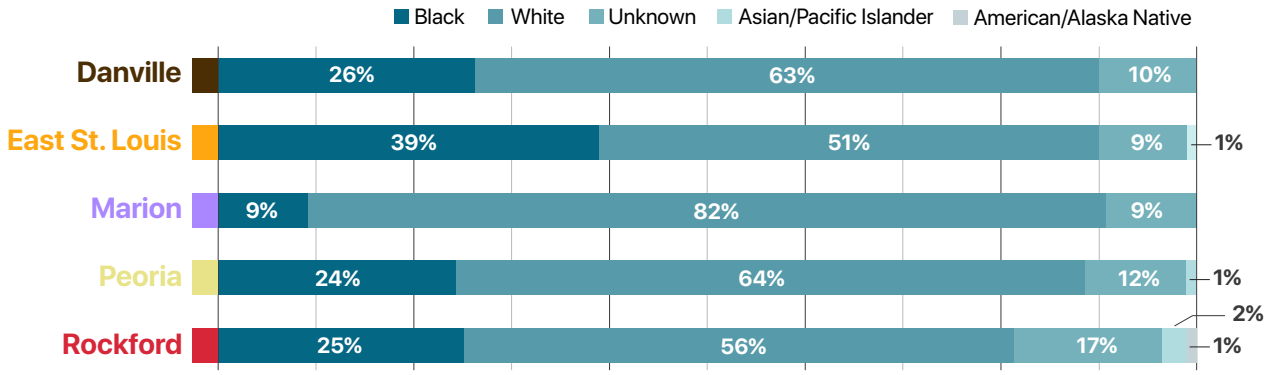


Figure 15: Inpatient Hospitalizations—Distribution of Races of Patients by Study Area

2019



2020

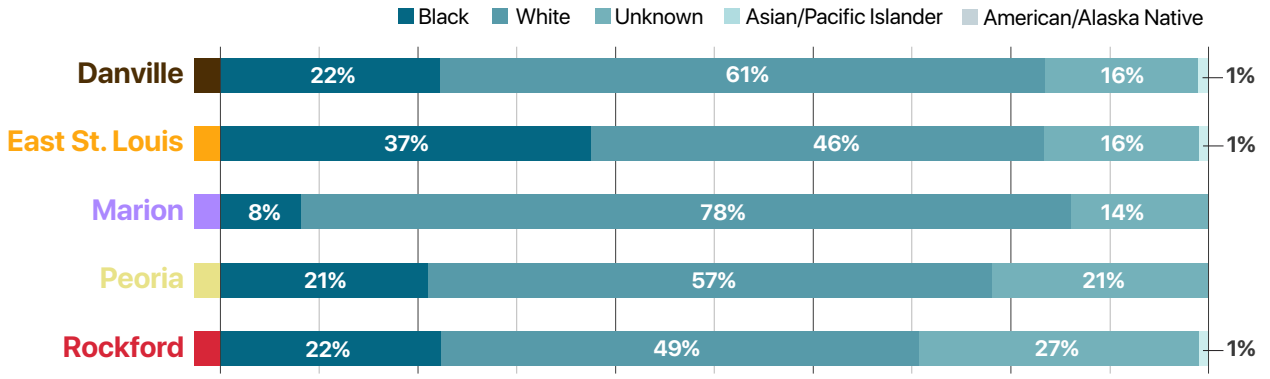


Figure 16: Emergency Department Visits—Distribution of Ages of Patients by Study Area

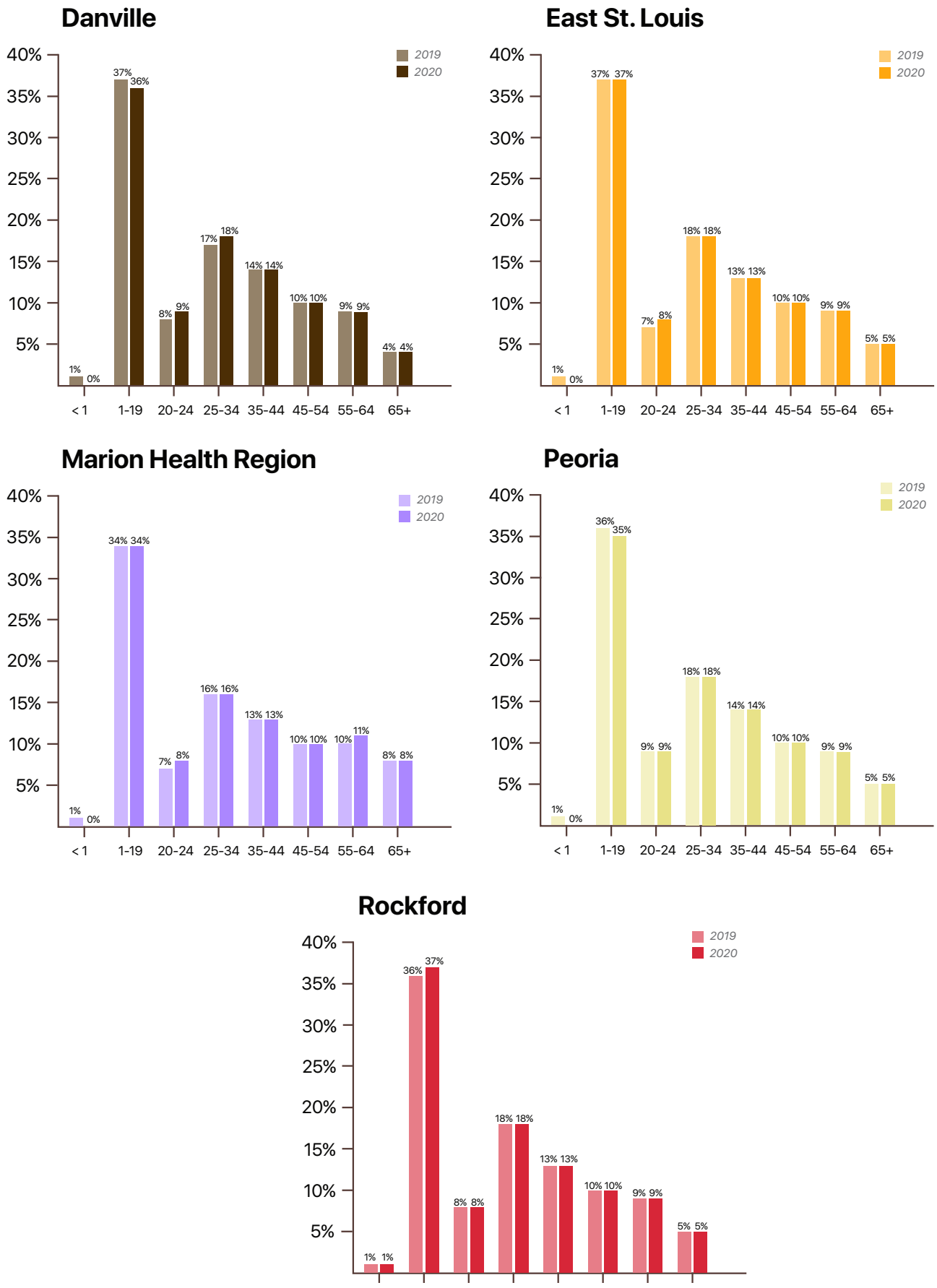


Figure 17: Emergency Department Visits—Distribution of Sex of Patients by Study Area

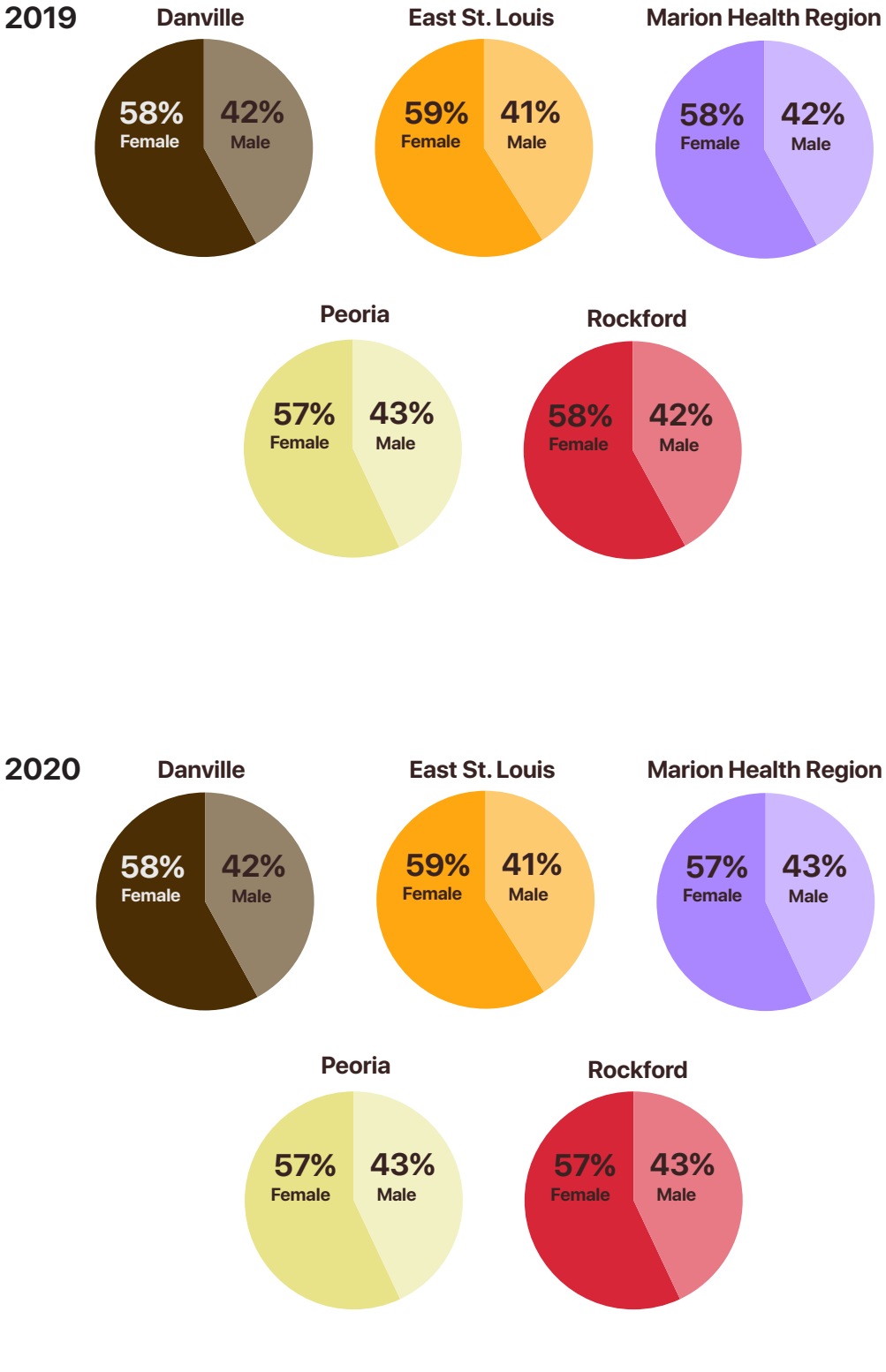
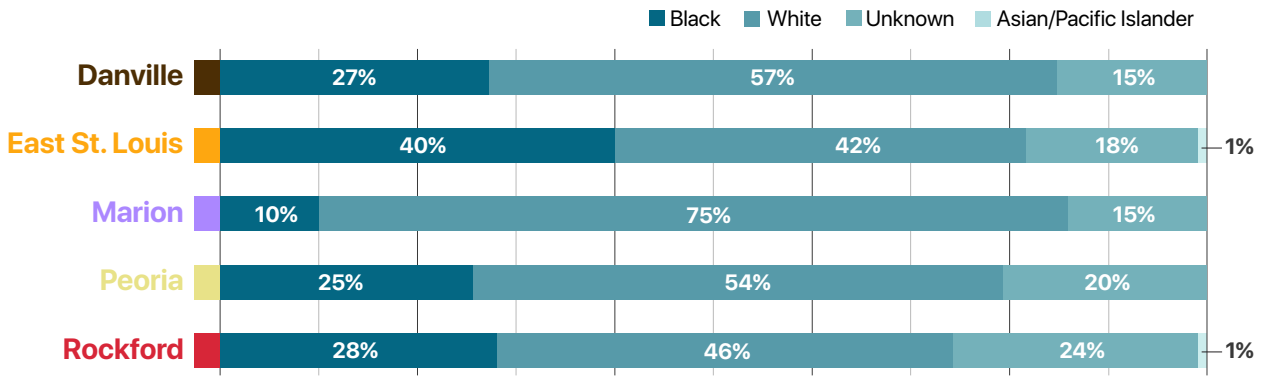


Figure 18: Emergency Department Visits—Distribution of Races of Patients by Study Area

2019



2020

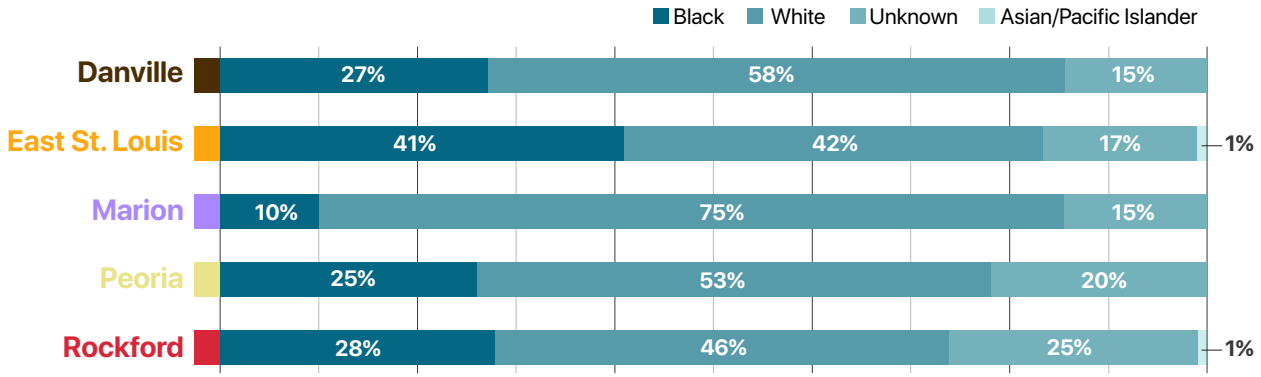
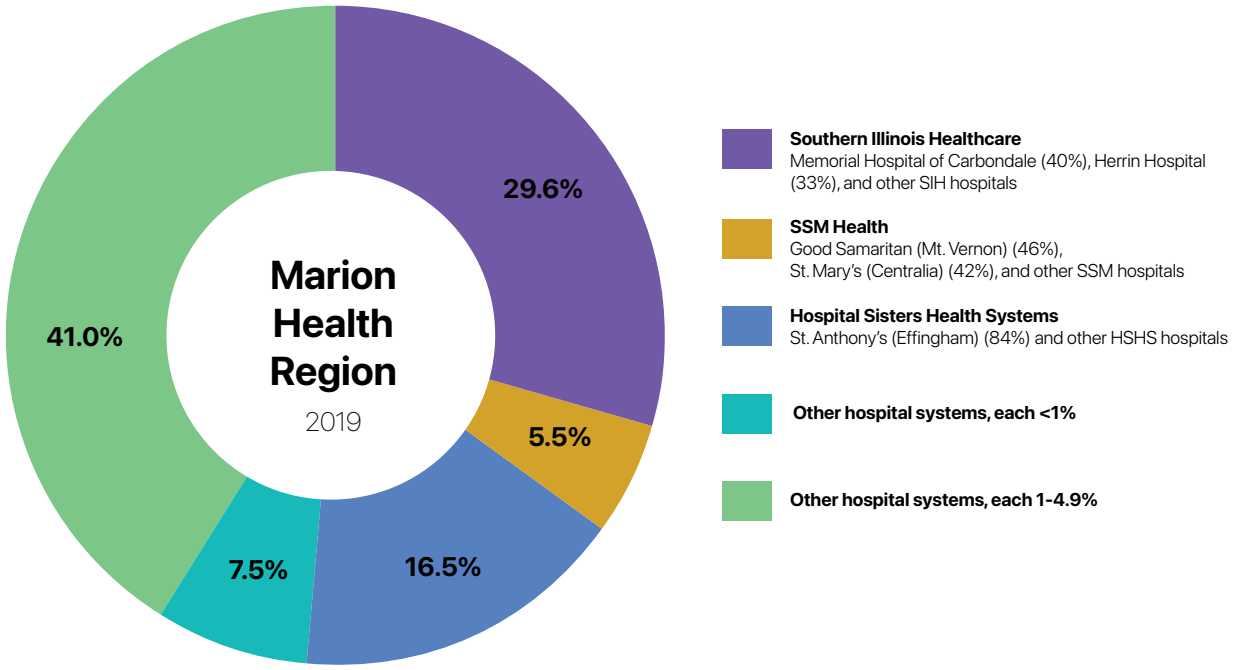
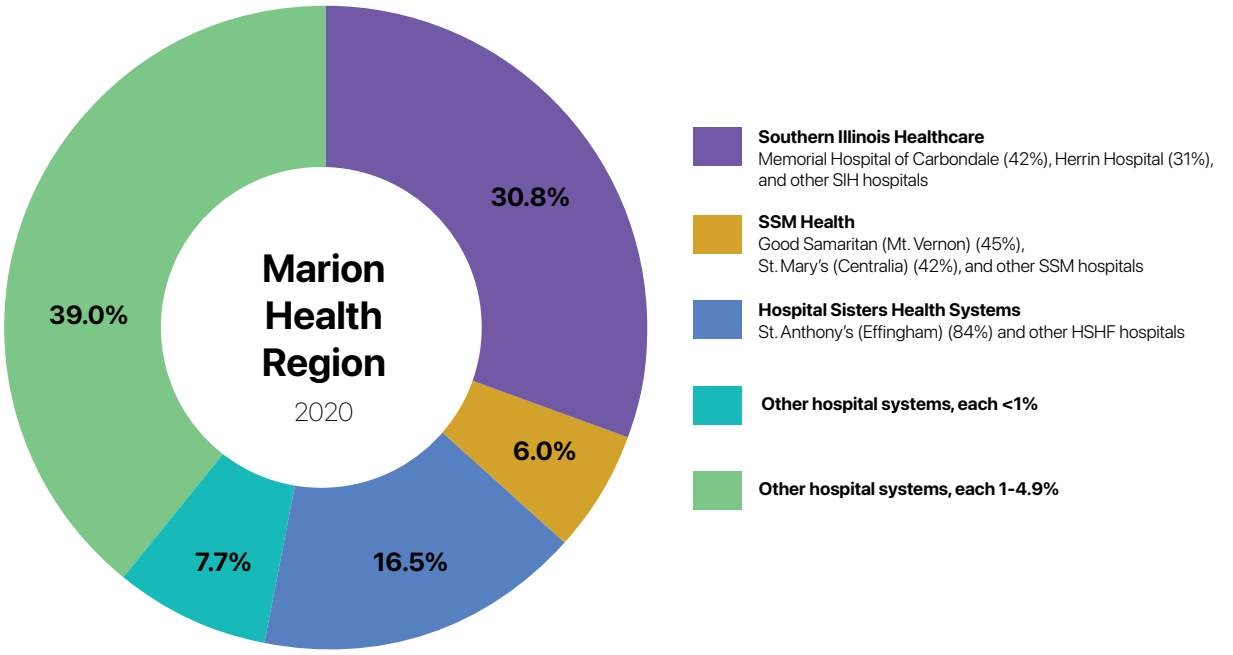


Figure 19: Estimated Share of Marion Health Region Medicaid Enrollees Admitted to the Hospital
(Share of hospitals receiving Medicaid enrollees who live in the Marion Health Region study area as patients for FY2019 and FY2020)





Appendix B:
Additional Analyses for Select Disease Groups and Conditions

Bipolar, Depressive, Opioid Use and Alcohol Use Disorders

After identifying the key disease groups and conditions (mental illnesses, psychoactive substance use disorders, and ACSCs), the data analytics team conducted additional analyses to develop a fuller understanding of these conditions.

For mental illness analyses, the research team focused on bipolar and depressive disorders for 2 reasons. First, these disorders represented the bulk of the mood [affective] disorders block, which was the most frequent and resource intensive of the disease blocks in the hospital utilization data. Second, these disorders are responsive to outpatient care treatment that can keep people out of the hospital.

For psychoactive substance use disorder analyses, the research team focused on opioid use disorder (OUD) and alcohol use disorders (AUD), since they represented the majority of the disorders in the psychoactive substance use disorders block and are outpatient-treatable.

Multivariate logistic regressions were performed to determine the population characteristics most associated with patients with bipolar, depressive, opioid use and alcohol use disorders. Tables 8–11 contain the results of the logistic regressions for these disorders. Variables highlighted in red represent a population characteristic statistically associated with the diagnosis (meaning the odds ratio and confidence level lower limit are ≥1 and the p-value is <0.05).

(Note: In the logistic regression tables that follow, AmericanIN/AN = American Indian/American Native, Asian/PI = Asian/Pacific Islander, Other/UNK = Other/Unknown, AUD = Alcohol Use Disorder, and OUD = Opioid Use Disorder.)

Summary of Population Characteristics Most Associated with Patients with Depressive Disorders

- Teenagers, age 12–19 in all areas
- Young adults, age 20–24 in Danville and Peoria

Table 8: Population Characteristics Associated with Depressive Disorder Patients (FY2019 and FY2020 Data Combined)

DEPRESSION_Danville			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	2.37	1.43	3.93	<0.001
15 to 19.9	25 to 34.9	2.54	1.70	3.80	<0.001
20 to 24.9	25 to 34.9	1.62	1.05	2.50	<0.05
35 to 44.9	25 to 34.9	0.83	0.53	1.30	0.41
45 to 64.9	25 to 34.9	0.6	0.39	0.92	<0.05
>65	25 to 34.9	0.17	0.05	0.56	
RACE					
AmericanIN/AN	White	0.88	0.12	6.49	0.89
Asian/PI	White	0.81	0.11	5.95	0.83
Black	White	0.51	0.36	0.73	<0.001
Other/Unknown	White	0.6	0.39	0.93	<0.05
SEX					
Female	Male	0.78	0.60	1.01	0.06

DEPRESSION_E. St. Louis			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	1.92	1.55	2.37	<0.001
15 to 19.9	25 to 34.9	2.06	1.73	2.46	<0.001
20 to 24.9	25 to 34.9	1.11	0.90	1.37	0.31
35 to 44.9	25 to 34.9	0.91	0.76	1.08	0.27
45 to 64.9	25 to 34.9	1.03	0.89	1.20	0.68
>65	25 to 34.9	0.52	0.39	0.68	<0.001
RACE					
AmericanIN/AN	White	1.65	0.92	2.97	0.09
Asian/PI	White	0.33	0.12	0.88	<0.05
Black	White	0.46	0.41	0.52	<0.001
Other/Unknown	White	0.63	0.53	0.75	<0.001
SEX					
Female	Male	0.82	0.74	0.91	<0.001

Table 8 Continued

DEPRESSION_Marion HR			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	1.37	1.12	1.67	<0.01
15 to 19.9	25 to 34.9	1.89	1.63	2.20	<0.001
20 to 24.9	25 to 34.9	1.13	0.97	1.35	0.11
35 to 44.9	25 to 34.9	0.93	0.80	1.07	0.3
45 to 64.9	25 to 34.9	0.61	0.53	0.70	<0.001
>65	25 to 34.9	0.47	0.38	0.57	<0.001
RACE					
AmericanIN/AN	White	1.6	0.87	2.95	0.13
Asian/PI	White	0.62	0.23	1.67	0.34
Black	White	0.67	0.56	0.80	<0.001
Other/Unknown	White	0.88	0.75	1.03	0.1
SEX					
Female	Male	0.97	0.88	1.06	0.48

DEPRESSION_Peoria			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	2.37	1.89	2.98	<0.001
15 to 19.9	25 to 34.9	2.71	2.27	3.24	<0.001
20 to 24.9	25 to 34.9	1.4	1.15	1.71	<0.001
35 to 44.9	25 to 34.9	0.92	0.77	1.11	0.39
45 to 64.9	25 to 34.9	0.81	0.68	0.95	<0.05
>65	25 to 34.9	0.35	0.25	0.49	<0.001
RACE					
AmericanIN/AN	White	0.69	0.25	1.87	0.46
Asian/PI	White	0.49	0.18	1.33	0.16
Black	White	0.51	0.44	0.59	<0.001
Other/Unknown	White	0.6	0.51	0.72	<0.001
SEX					
Female	Male	1.1	0.99	1.23	0.08

DEPRESSION_Rockford			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	3.13	2.39	4.10	<0.001
15 to 19.9	25 to 34.9	3.44	2.76	4.28	<0.001
20 to 24.9	25 to 34.9	1.17	0.89	1.54	0.25
35 to 44.9	25 to 34.9	1.14	0.90	1.43	0.26
45 to 64.9	25 to 34.9	1	0.81	1.23	0.96
>65	25 to 34.9	0.38	0.25	0.57	<0.001
RACE					
AmericanIN/AN	White	1.41	0.69	2.90	0.34
Asian/PI	White	0.37	0.16	0.83	0.05
Black	White	0.62	0.53	0.74	<0.001
Other/Unknown	White	0.7	0.59	0.84	<0.001
SEX					
Female	Male	0.87	0.76	0.99	0.05

Summary of Population Characteristics Most Associated with Patients with Bipolar Disorders

- Native Americans in Danville and the Marion Health Region

Table 9: Population Characteristics Associated with Bipolar Disorder Patients (FY2019 and FY2020 Data Combined)

Bipolar_Danville			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	0.26	0.08	0.87	<0.05
15 to 19.9	25 to 34.9	0.78	0.43	1.40	0.4
20 to 24.9	25 to 34.9	0.9	0.52	1.55	0.7
35 to 44.9	25 to 34.9	1.1	0.71	1.71	0.65
45 to 64.9	25 to 34.9	0.49	0.30	0.79	<0.01
>65	25 to 34.9	0	0.00	INF	0.98
RACE					
AmericanIN/AN	White	4.48	1.35	14.92	<0.05
Asian/PI	White	0	0.00	INF	0.96
Black	White	0.67	0.44	1.00	0.52
Other/Unknown	White	0.76	0.38	1.52	0.43
SEX					
Female	Male	0.71	0.51	0.99	<0.05

Bipolar_E. St. Louis			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	0.54	0.33	0.88	<0.05
15 to 19.9	25 to 34.9	1.14	0.84	1.54	0.39
20 to 24.9	25 to 34.9	0.84	0.61	1.16	0.29
35 to 44.9	25 to 34.9	1.01	0.79	1.29	0.95
45 to 64.9	25 to 34.9	0.66	0.52	0.83	<0.001
>65	25 to 34.9	0.25	0.15	0.42	<0.001
RACE					
AmericanIN/AN	White	1.03	0.33	3.25	0.09
Asian/PI	White	1.35	0.60	3.04	0.47
Black	White	0.37	0.30	0.45	<0.001
Other/Unknown	White	0.51	0.36	0.71	<0.001
SEX					
Female	Male	0.86	0.72	1.02	0.08

Table 9 Continued

Bipolar_Marion HR			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	0.61	0.38	0.05	<0.05
15 to 19.9	25 to 34.9	1.13	0.85	1.49	0.41
20 to 24.9	25 to 34.9	0.89	0.67	1.20	0.45
35 to 44.9	25 to 34.9	1.05	0.84	1.33	0.65
45 to 64.9	25 to 34.9	0.66	0.53	0.82	<0.001
>65	25 to 34.9	0.3	0.21	0.44	<0.001
RACE					
AmericanIN/AN	White	2.93	1.38	6.28	<0.01
Asian/PI	White	0.95	0.24	3.86	0.94
Black	White	0.59	0.43	0.82	<0.01
Other/Unknown	White	0.56	0.40		<0.01
SEX					
Female	Male	0.91	0.77	1.06	0.21

Bipolar_Peoria			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	0.66	0.39	1.11	0.11
15 to 19.9	25 to 34.9	1.2	0.86	1.68	0.27
20 to 24.9	25 to 34.9	1.28	0.95	1.73	0.10
35 to 44.9	25 to 34.9	0.91	0.69	1.20	0.50
45 to 64.9	25 to 34.9	0.67	0.52	0.88	<0.01
>65	25 to 34.9	0.19	0.10	0.37	<0.001
RACE					
AmericanIN/AN	White	1.02	0.25	4.14	0.98
Asian/PI	White	0.38	0.05	2.71	0.33
Black	White	0.54	0.42	0.69	<0.001
Other/Unknown	White	0.58	0.41	0.82	<0.01
SEX					
Female	Male	0.87	0.72	1.05	0.14

Bipolar_Rockford			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	0.73	0.43	1.25	0.25
15 to 19.9	25 to 34.9	1.08	0.75	1.54	0.67
20 to 24.9	25 to 34.9	0.98	0.69	1.40	0.91
35 to 44.9	25 to 34.9	1.09	0.82	1.45	0.53
45 to 64.9	25 to 34.9	0.82	0.63	1.07	0.14
>65	25 to 34.9	0.15	0.07	0.33	<0.001
RACE					
AmericanIN/AN	White	1.81	0.73	4.44	0.19
Asian/PI	White	0.26	0.06	1.05	0.06
Black	White	0.61	0.48	0.78	<0.001
Other/Unknown	White	0.64	0.47	0.88	<0.01
SEX					
Female	Male	0.64	0.53	0.78	<0.001

Summary of Population Characteristics Most Associated with Patients with Opioid Use Disorder

While no particular characteristic is statistically associated with OUD, low odds ratios of women compared to men indicate that being female is likely a protective factor in terms of OUD.

Table 10: Population Characteristics Associated with Opioid Use Disorder Patients (FY2019 and FY2020 Data Combined)

OUD_Danville			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	0	0.00	INF	0.99
15 to 19.9	25 to 34.9	0.11	0.01	0.82	<0.05
20 to 24.9	25 to 34.9	0.28	0.08	0.95	<0.05
35 to 44.9	25 to 34.9	0.92	0.49	1.75	0.8
45 to 64.9	25 to 34.9	0.34	0.16	0.70	<0.01
>65	25 to 34.9	0	0.00	INF	0.99
RACE					
AmericanIN/AN	White	3.48	0.46	26.43	0.22
Asian/PI	White	0	0.00	INF	0.99
Black	White	0.61	0.31	1.20	0.15
Other/Unknown	White	0	0.00	INF	0.98
SEX					
Female	Male	0.44	0.26	0.76	<0.01

OUD_E. St. Louis			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	0	0.00	INF	0.97
15 to 19.9	25 to 34.9	0.03	0.01	0.12	<0.001
20 to 24.9	25 to 34.9	0.39	0.25	0.61	<0.001
35 to 44.9	25 to 34.9	0.98	0.78	1.25	0.88
45 to 64.9	25 to 34.9	0.28	0.21	0.37	<0.001
>65	25 to 34.9	0.015	0.00	0.11	<0.001
RACE					
AmericanIN/AN	White	0.84	0.21	3.43	0.81
Asian/PI	White	0.61	0.15	2.47	0.48
Black	White	0.21	0.15	0.28	<0.001
Other/Unknown	White	0.29	0.15	0.55	<0.001
SEX					
Female	Male	0.39	0.32	0.48	<0.001

Table 10 Continued

OUD_Marion HR			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	0	0.00	INF	0.98
15 to 19.9	25 to 34.9	0.036	0.00	0.26	<0.001
20 to 24.9	25 to 34.9	0.38	0.20	0.75	<0.01
35 to 44.9	25 to 34.9	1.07	0.73	1.55	0.73
45 to 64.9	25 to 34.9	0.43	0.29	0.65	<0.001
>65	25 to 34.9	0.025	0.00	0.18	<0.001
RACE					
AmericanIN/AN	White	1.47	0.20	10.57	0.7
Asian/PI	White	0	0.00	INF	0.99
Black	White	0.92	0.55	1.54	0.74
Other/Unknown	White	0.72	0.31	1.64	0.43
SEX					
Female	Male	0.55	0.40	0.75	<0.001

OUD_Peoria			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	0	0.00	INF	0.98
15 to 19.9	25 to 34.9	0	0.00	INF	0.98
20 to 24.9	25 to 34.9	0.22	0.07	0.72	<0.05
35 to 44.9	25 to 34.9	1.13	0.68	1.90	0.63
45 to 64.9	25 to 34.9	0.63	0.37	1.07	0.85
>65	25 to 34.9	0.081	0.01	0.60	<0.05
RACE					
AmericanIN/AN	White	0	0.00	INF	0.99
Asian/PI	White	0	0.00	INF	0.99
Black	White	0.46	0.25	0.83	<0.05
Other/Unknown	White	0.73	0.26	2.02	<0.01
SEX					
Female	Male	0.7	0.46	1.07	0.09

OUD_Rockford			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	0	0.00	INF	0.98
15 to 19.9	25 to 34.9	0.037	0.01	0.27	<0.01
20 to 24.9	25 to 34.9	0.25	0.11	0.58	<0.01
35 to 44.9	25 to 34.9	0.95	0.64	1.41	0.78
45 to 64.9	25 to 34.9	0.34	0.22	0.53	<0.001
>65	25 to 34.9	0.26	0.12	0.58	<0.001
RACE					
AmericanIN/AN	White	2.02	0.49	8.31	0.33
Asian/PI	White	0	0.00	INF	0.99
Black	White	0.41	0.26	0.63	<0.001
Other/Unknown	White	0.55	0.29	1.07	0.07
SEX					
Female	Male	0.39	0.28	0.55	<0.001

Summary of Population Characteristics Most Associated with Patients with Alcohol Use Disorder

- Adults age 35–64 in East St. Louis and Rockford
- Native Americans in the Marion Health Region

Table 11: Population Characteristics Associated with Alcohol Use Disorder Patients (FY2019 and FY2020 Data Combined)

AUD_Danville			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	0	0.00	INF	0.98
15 to 19.9	25 to 34.9	0.077	0.01	0.58	<0.05
20 to 24.9	25 to 34.9	0.57	0.23	1.41	0.22
35 to 44.9	25 to 34.9	1.1	0.59	1.99	0.78
45 to 64.9	25 to 34.9	1.44	0.86	2.41	0.16
>65	25 to 34.9	0.13	0.02	1.00	0.05
RACE					
AmericanIN/AN	White	0	0.00	INF	0.99
Asian/PI	White	2.06	0.27	15.40	0.48
Black	White	0.98	0.62	1.55	0.93
Other/Unknown	White	0.98	0.39	2.48	0.96
SEX					
Female	Male	0.3	0.20	0.46	<0.001

AUD_E. St. Louis			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	0.035	0.00	0.25	<0.001
15 to 19.9	25 to 34.9	0.23	0.12	0.43	<0.001
20 to 24.9	25 to 34.9	0.45	0.07	0.73	<0.01
35 to 44.9	25 to 34.9	1.49	1.15	1.92	<0.01
45 to 64.9	25 to 34.9	1.37	1.09	1.73	<0.01
>65	25 to 34.9	0.4	0.24	0.67	<0.05
RACE					
AmericanIN/AN	White	1.82	0.67	4.97	0.24
Asian/PI	White	0	0.00	INF	0.98
Black	White	0.83	0.69	0.99	<0.01
Other/Unknown	White	0.46	0.27	0.77	<0.001
SEX					
Female	Male	0.31	0.26	0.37	<0.001

Table 11 Continued

AUD_Marion HR			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	0	0.00	INF	0.93
15 to 19.9	25 to 34.9	0.28	0.17	0.48	<0.001
20 to 24.9	25 to 34.9	0.56	0.37	0.85	<0.01
35 to 44.9	25 to 34.9	1.29	1.00	1.67	0.05
45 to 64.9	25 to 34.9	1.05	0.83	1.33	0.67
>65	25 to 34.9	0.23	0.14	0.39	0.99
RACE					
AmericanIN/AN	White	3.48	1.62	7.49	<0.01
Asian/PI	White	0	0.00	INF	0.98
Black	White	0.93	0.68	1.26	0.64
Other/Unknown	White	0.99	0.67	1.47	0.97
SEX					
Female	Male	0.39	0.32	0.47	<0.001

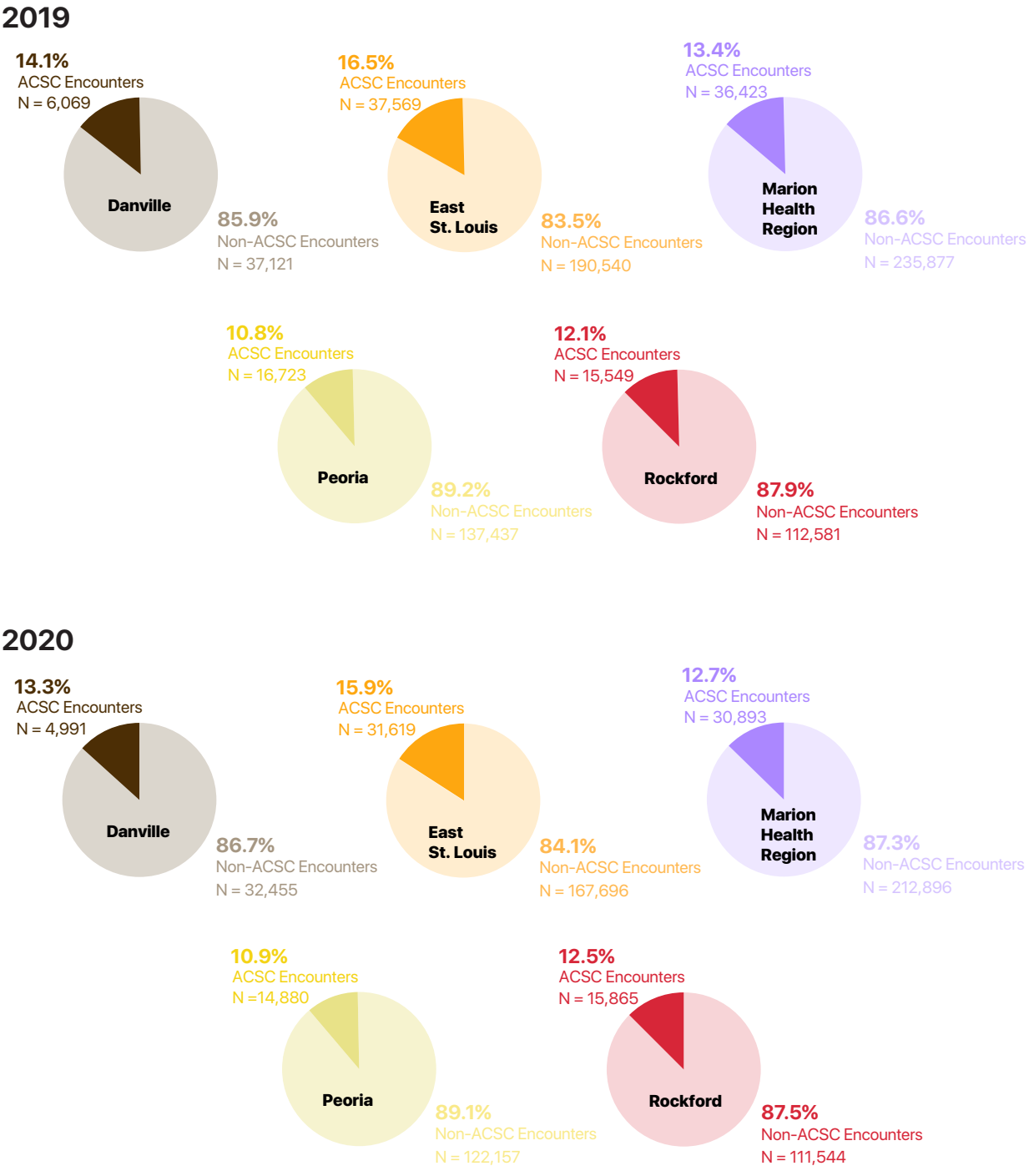
AUD_Peoria			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	0.036	0.01	0.26	<0.01
15 to 19.9	25 to 34.9	0.19	0.09	0.38	<0.001
20 to 24.9	25 to 34.9	0.76	0.51	1.12	0.16
35 to 44.9	25 to 34.9	1.33	1.02	1.75	0.16
45 to 64.9	25 to 34.9	1.23	0.96	1.57	<0.05
>65	25 to 34.9	0.29	0.16	0.53	<0.001
RACE					
AmericanIN/AN	White	0.54	0.00	3.86	0.53
Asian/PI	White	0.45	0.06	3.25	0.43
Black	White	0.89	0.71	1.10	0.27
Other/Unknown	White	0.61	0.39	0.96	<0.05
SEX					
Female	Male	0.33	0.07	0.40	<0.001

AUD_Rockford			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
12 to 14.9	25 to 34.9	0	0.00	INF	0.98
15 to 19.9	25 to 34.9	0.17	0.06	0.47	<0.001
20 to 24.9	25 to 34.9	0.52	0.28	0.98	0.05*
35 to 44.9	25 to 34.9	1.75	1.24	2.46	<0.01
45 to 64.9	25 to 34.9	1.62	1.18	2.21	<0.01
>65	25 to 34.9	0.29	0.14	0.62	<0.01
RACE					
AmericanIN/AN	White	0	0.00	INF	0.99
Asian/PI	White	0.49	0.16	1.54	0.22
Black	White	0.55	0.42	0.73	<0.001
Other/Unknown	White	0.37	0.21	0.64	<0.001
SEX					
Female	Male	0.31	0.24	0.39	<0.001

Ambulatory Care Sensitive Conditions

ACSCs, which are health conditions for which good outpatient care can potentially prevent the need for hospitalization or early intervention can prevent complications or more severe disease (26) and they are some of the most frequent and resource-intensive conditions in the FY2019 and FY2020 Medicaid institutional data. In fact, ACSCs account for approximately 10–17% of all care encounters in the institutional data across the study areas (see Figure 20).

Figure 20: Distribution of Care Encounters for ACSCs and Non-ACSCs by Study Area



A majority of ACSC care encounters take place in the ED or the hospital as opposed to outpatient settings, adding evidence to the lack of outpatient resources in each of the areas under study (see Figure 21).

Figure 21: Distribution of Point of Care Encounters for ACSCs by Study Area

AHRQ developed Preventative Quality Indicators (PQIs), measures based on ACSC hospital inpatient discharge data and designed to identify outpatient care quality and access issues, including appropriate follow-up care after hospital discharge. These benchmarks for healthcare accessibility and quality are based on a subset of the ACSC codes for hospital admissions in the John Billings algorithm (27). Specifically, PQIs use data from hospital discharges to identify admissions that might have been avoided through access to high-quality outpatient care. In other words, while PQIs are based on hospital inpatient data, they provide insight into the quality of the healthcare ecosystem outside hospitals and in the community by measuring preventable complications that occur in a given population (in a community or region) (28). Four composite PQIs and several disease-specific PQIs make up the composite measures.

Composite PQIs:

- PQI 90 Composite combines hospitalizations diagnoses for all PQIs below
- PQI 91 Acute is a composite indicator of acute, episodic hospitalization diagnoses and is composed of the following disease-specific acute PQIs:
  - -PQI 11 Bacterial Pneumonia Admission Rate
  - -PQI 12 Urinary Tract Infection Admission Rate
- PQI 92 Chronic is a composite indicator of chronic disease hospitalizations and is comprised of the following disease-specific chronic PQIs:
  - -PQI 01 Diabetes Mellitus, Short-Term Complications Admission Rate
  - -PQI 03 Diabetes Mellitus, Long-Term Complications Admission Rate
  - -PQI 05 COPD or Asthma, Older Adults (40+) Admission Rate
  - -PQI 07 Hypertension Admission Rate
  - -PQI 08 Congestive Heart Failure Admission Rate
  - -PQI 10 Dehydration Admission Rate
  - -PQI 14 Uncontrolled Diabetes Mellitus Admission Rate
  - -PQI 15 Asthma, Younger Adults (18–39) Admission Rate
  - -PQI 16 Rate of Lower Extremity Amputation among Patients with Diabetes
- PQI 93 Diabetes Mellitus Hospitalization Composite is a combined measure of diabetes-related PQIs:
  - -PQI 01 Diabetes Mellitus, Short-Term Complications Admission Rate
  - -PQI 03 Diabetes Mellitus, Long-Term Complications Admission Rate
  - -PQI 14 Uncontrolled Diabetes Mellitus Admission Rate

Population characteristics associated with PQI composite measures were computed and appear in Tables 12 to 15.

(Note: In the logistic regression tables that follow, AmerIN/AN = American Indian/American Native, Asian/PI = Asian/Pacific Islander, and Other/UNK = Other/Unknown.)

Summary of Population Characteristics Most Associated with PQI 90, a composite of all PQI measures:

- Adults, age 40 and over
- Black people in all areas except the Marion Health Region

Table 12: Population Characteristics Associated with PQI 90, Overall ACSC Composite (FY2019 and FY2020 Data Combined)

PQI 90_Danville			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	3.41	3.07	3.78	<.0001
65-74	18-39	5.37	4.70	6.13	<.0001
75 or older	18-39	5.99	5.23	6.85	<.0001
RACE					
AmerIN/AN	White	1.65	0.74	3.69	0.22
Asian/PI	White	0.93	0.66	1.29	0.66
Black	White	1.57	1.44	1.71	<.0001
Other/UNK	White	1.38	1.21	1.59	<.0001
SEX					
Male	Female	1.00	0.92	1.08	0.99

PQI 90_E. St. Louis			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	3.81	3.32	4.36	<.0001
65-74	18-39	5.52	4.65	6.56	<.0001
75 or older	18-39	4.61	3.80	5.59	<.0001
RACE					
AmerIN/AN	White	1.76	0.96	3.26	0.069
Asian/PI	White	0.71	0.33	1.52	0.37
Black	White	1.41	1.25	1.59	<.0001
Other/UNK	White	1.31	1.00	1.72	0.050
SEX					
Male	Female	1.00	0.90	1.11	0.98

Table 12 Continued

PQI 90_Marion HR			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	3.47	3.05	3.95	<.0001
65-74	18-39	5.80	5.00	6.73	<.0001
75 or older	18-39	6.42	5.51	7.49	<.0001
RACE					
AmerIN/AN	White	2.14	1.14	4.01	0.018
Asian/PI	White	0.79	0.33	1.88	0.59
Black	White	1.15	0.99	1.34	0.070
Other/UNK	White	0.85	0.63	1.14	0.27
SEX					
Male	Female	1.04	0.95	1.14	0.36

PQI 90_Peoria			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	4.32	3.56	5.24	<.0001
65-74	18-39	6.20	4.86	7.91	<.0001
75 or older	18-39	8.99	6.98	11.58	<.0001
RACE					
AmerIN/AN	White	NR	NR	NR	NR
Asian/PI	White	0.75	0.27	2.13	0.59
Black	White	1.41	1.20	1.64	<.0001
Other/UNK	White	1.05	0.75	1.48	0.79
SEX					
Male	Female	0.86	0.74	0.99	0.036

NR = Not reported due to small sample size/unstable estimate

PQI 90_Rockford			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	3.34	2.79	4.01	<.0001
65-74	18-39	5.48	4.31	6.95	<.0001
75 or older	18-39	6.63	5.18	8.49	<.0001
RACE					
AmerIN/AN	White	0.98	0.48	2.01	0.95
Asian/PI	White	0.68	0.37	1.25	0.21
Black	White	1.48	1.27	1.74	<.0001
Other/UNK	White	1.03	0.80	1.32	0.84
SEX					
Male	Female	0.96	0.83	1.10	0.56

Summary of Population Characteristics Most Associated with PQI 91, a composite of acute PQI measures:

- Adults, age 40 and over
- Females in East St. Louis, the Marion Health Region and Peoria

Table 13: Population Characteristics Associated with PQI 91, ACSC Acute Composite (FY2019 and FY2020 Data Combined)

PQI 91_Danville			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	8.32	4.07	16.98	<.0001
65-74	18-39	9.01	3.79	21.43	<.0001
75 or older	18-39	19.40	8.68	43.37	<.0001
RACE					
AmerIN/AN	White	NR	NR	NR	NR
Asian/PI	White	NR	NR	NR	NR
Black	White	0.85	0.51	1.41	0.52
Other/UNK	White	0.86	0.31	2.42	0.78
SEX					
Female	Male	1.40	0.91	2.14	0.12

NR = Not reported due to small sample size/unstable estimate

PQI 91_E. St. Louis			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	4.64	3.36	6.40	<.0001
65-74	18-39	6.52	4.46	9.53	<.0001
75 or older	18-39	10.85	7.49	15.73	<.0001
RACE					
AmerIN/AN	White	0.47	0.06	3.46	0.46
Asian/PI	White	0.70	0.17	2.93	0.62
Black	White	0.96	0.77	1.20	0.72
Other/UNK	White	0.91	0.50	1.65	0.75
SEX					
Female	Male	1.31	1.06	1.62	0.01

Table 13 Continued

PQI 91_Marion HR			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	3.42	2.68	4.36	<.0001
65-74	18-39	6.59	5.07	8.58	<.0001
75 or older	18-39	9.78	7.57	12.64	<.0001
RACE					
AmerIN/AN	White	NR	NR	NR	NR
Asian/PI	White	0.73	0.17	3.05	0.66
Black	White	0.59	0.42	0.82	0.0017
Other/UNK	White	0.69	0.39	1.21	0.19
SEX					
Female	Male	1.25	1.07	1.46	0.0049

NR = Not reported due to small sample size/unstable estimate

PQI 91_Peoria			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	3.68	2.42	5.60	<.0001
65-74	18-39	6.73	4.11	11.00	<.0001
75 or older	18-39	12.57	7.88	20.06	<.0001
RACE					
AmerIN/AN	White	NR	NR	NR	NR
Asian/PI	White	0.65	0.09	4.83	0.68
Black	White	0.80	0.56	1.15	0.23
Other/UNK	White	0.83	0.40	1.71	0.61
SEX					
Female	Male	1.53	1.13	2.08	0.0055

NR = Not reported due to small sample size/unstable estimate

PQI 91_Rockford			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	2.75	1.91	3.95	<.0001
65-74	18-39	5.72	3.70	8.84	<.0001
75 or older	18-39	8.88	5.89	13.40	<.0001
RACE					
AmerIN/AN	White	0.48	0.07	3.50	0.47
Asian/PI	White	0.56	0.17	1.79	0.32
Black	White	0.90	0.65	1.23	0.49
Other/UNK	White	1.07	0.69	1.66	0.75
SEX					
Female	Male	1.13	0.86	1.47	0.38

Summary of Population Characteristics Most Associated with PQI 92, a composite of chronic PQI measures:

- Adults, age 40 and over
- Black people in all areas
- Males in the Marion Health Region

Table 14: Population Characteristics Associated with PQI 92, ACSC Chronic Composite (FY2019 and FY2020 Data Combined)

PQI 92_Danville			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	4.47	3.19	6.27	<.0001
65-74	18-39	5.52	3.48	8.74	<.0001
75 or older	18-39	5.69	3.46	9.36	<.0001
RACE					
AmerIN/AN	White	NR	NR	NR	NR
Asian/PI	White	NR	NR	NR	NR
Black	White	1.80	1.37	2.37	<.0001
Other/UNK	White	0.80	0.39	1.62	0.53
SEX					
Male	Female	0.86	0.66	1.12	0.27

NR = Not reported due to small sample size/unstable estimate

PQI 92_E. St. Louis			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	3.43	2.96	3.97	<.0001
65-74	18-39	4.88	4.06	5.88	<.0001
75 or older	18-39	3.22	2.59	4.01	<.0001
RACE					
AmerIN/AN	White	2.19	1.17	4.10	0.014
Asian/PI	White	0.73	0.31	1.74	0.48
Black	White	1.56	1.37	1.77	<.0001
Other/UNK	White	1.43	1.07	1.91	0.017
SEX					
Male	Female	1.07	0.96	1.20	0.23

Table 14 Continued

PQI 92_Marion HR			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	3.05	2.62	3.55	<.0001
65-74	18-39	4.18	3.50	5.00	<.0001
75 or older	18-39	3.57	2.94	4.32	<.0001
RACE					
AmerIN/AN	White	3.03	1.58	5.79	0.0009
Asian/PI	White	0.80	0.28	2.29	0.68
Black	White	1.41	1.18	1.69	0.0002
Other/UNK	White	0.93	0.66	1.30	0.67
SEX					
Male	Female	1.20	1.08	1.34	0.0007

PQI 92_Peoria			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	4.31	3.48	5.34	<.0001
65-74	18-39	5.62	4.27	7.38	<.0001
75 or older	18-39	6.84	5.10	9.16	<.0001
RACE					
AmerIN/AN	White	NR	NR	NR	NR
Asian/PI	White	0.80	0.25	2.61	0.71
Black	White	1.59	1.34	1.89	<.0001
Other/UNK	White	1.12	0.77	1.64	0.55
SEX					
Male	Female	0.94	0.80	1.10	0.41

NR = Not reported due to small sample size/unstable estimate

PQI 92_Rockford			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	3.40	2.78	4.17	<.0001
65-74	18-39	4.94	3.78	6.47	<.0001
75 or older	18-39	5.11	3.83	6.81	<.0001
RACE					
AmerIN/AN	White	1.21	0.57	2.58	0.62
Asian/PI	White	0.77	0.39	1.51	0.45
Black	White	1.69	1.42	2.01	<.0001
Other/UNK	White	1.00	0.75	1.34	1.00
SEX					
Male	Female	0.98	0.84	1.15	0.83

Summary of Population Characteristics Most Associated with PQI 93, a composite of diabetes measures:

- Males in the Marion Health Region
- Middle-age (40–64) adults and adults 75 and older in Peoria
- Black, male adults age 65–74 in Rockford

Table 15: Population Characteristics Associated with PQI 93, Diabetes Hospitalization Composite (FY2019 and FY2020 Data Combined)

PQI 93_Danville			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	1.51	0.91	2.52	0.11
65-74	18-39	0.59	0.18	1.97	0.39
75 or older	18-39	0.80	0.24	2.67	0.71
RACE					
AmerIN/AN	White	NR	NR	NR	NR
Asian/PI	White	NR	NR	NR	NR
Black	White	0.90	0.52	1.55	0.71
Other/UNK	White	0.87	0.27	2.84	0.82
SEX					
Male	Female	1.49	0.92	2.41	0.11

NR = Not reported due to small sample size/unstable estimate

PQI 93_E. St. Louis			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	1.14	0.92	1.41	0.23
65-74	18-39	1.02	0.72	1.44	0.91
75 or older	18-39	0.63	0.39	1.02	0.060
RACE					
AmerIN/AN	White	0.42	0.06	3.05	0.39
Asian/PI	White	1.30	0.40	4.23	0.66
Black	White	1.16	0.94	1.44	0.17
Other/UNK	White	1.22	0.75	1.97	0.42
SEX					
Male	Female	1.21	0.99	1.47	0.064

Table 15 Continued

PQI 93_Marion HR			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	1.03	0.84	1.26	0.79
65-74	18-39	0.69	0.50	0.96	0.03
75 or older	18-39	0.31	0.19	0.52	<.0001
RACE					
AmerIN/AN	White	0.88	0.21	3.64	0.85
Asian/PI	White	1.53	0.36	6.39	0.56
Black	White	1.28	0.95	1.72	0.11
Other/UNK	White	0.88	0.52	1.50	0.64
SEX					
Male	Female	1.86	1.54	2.25	<.0001

PQI 93_Peoria			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	1.94	1.43	2.63	<.0001
65-74	18-39	1.60	0.98	2.63	0.063
75 or older	18-39	1.76	1.01	3.05	0.046
RACE					
AmerIN/AN	White	NR	NR	NR	NR
Asian/PI	White	NR	NR	NR	NR
Black	White	1.20	0.89	1.62	0.23
Other/UNK	White	1.40	0.80	2.44	0.24
SEX					
Male	Female	1.02	0.78	1.34	0.87

NR = Not reported due to small sample size/unstable estimate

PQI 93_Rockford			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
40-64	18-39	1.29	0.95	1.74	0.099
65-74	18-39	1.69	1.08	2.64	0.021
75 or older	18-39	0.82	0.43	1.57	0.54
RACE					
AmerIN/AN	White	0.43	0.06	3.13	0.40
Asian/PI	White	0.92	0.28	2.97	0.88
Black	White	1.67	1.25	2.23	0.0005
Other/UNK	White	0.98	0.59	1.63	0.95
SEX					
Male	Female	1.74	1.33	2.28	<.0001

A majority of hospital-level care for ACSCs take places in the ED. PQIs are measures for ACSC hospitalizations. For ED visits, ACSCs can be categorized as acute, chronic, or avoidable (29). Table 16 lists the conditions included in each of these categories. Population characteristics associated with PQI composite measures were computed and appear in Tables 17–19.

(Note: In the logistic regression tables that follow, AmerIN/AN = American Indian/American Native, Asian/PI = Asian/Pacific Islander, and Other/UNK = Other/Unknown.)

Table 16: Diseases Comprising Acute, Chronic, and Avoidable ACSCs

ACUTE	CHRONIC	AVOIDABLE
Bacterial Pneumonia	Angina	Congenital syphilis
Bronchitis	Asthma	Failure-to-thrive
Cellulitis	Chronic obstructive pulmonary disease (COPD)	Dental conditions
Seizure (non-epileptic)	Congestive heart failure (CHF)	Vaccine preventable
Dehydration	Diabetes	Nutritional deficiencies
Gastroenteritis, noninfective	Grand mal status and other, epileptic convulsions	
Hypoglycemia	Hypertension	
Kidney/urinary infection	Tuberculosis (non-pulmonary)	
Pelvic inflammatory disease	Tuberculosis (pulmonary)	
Severe ear, nose, and throat infections		
Skin grafts with cellulitis		

Summary of Population Characteristics Most Associated with Acute ACSC ED Visits

- In general, children younger than 12 and teenagers age 12–19
- Young adults age 20–24 in the Marion Health Region and Rockford
- Females in East St. Louis, the Marion Health Region, Peoria, and Rockford

Table 17: Population Characteristics Associated with Acute ACSC ED Visits (FY2019 and FY2020 Data Combined)

ACUTE_Danville			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
< 1 y	25 to 34.9	3.73	3.12	4.46	<.0001
1 to 2.9	25 to 34.9	4.01	3.42	4.71	<.0001
3 to 5.9	25 to 34.9	3.76	3.17	4.47	<.0001
6 to 11.9	25 to 34.9	2.88	2.45	3.38	<.0001
12 to 14.9	25 to 34.9	1.36	1.06	1.74	0.017
15 to 19.9	25 to 34.9	1.10	0.91	1.32	0.32
20 to 24.9	25 to 34.9	0.90	0.75	1.07	0.22
35 to 44.9	25 to 34.9	0.92	0.79	1.07	0.28
45 to 64.9	25 to 34.9	0.77	0.67	0.89	0.0004
65 or older	25 to 34.9	0.62	0.45	0.85	0.0033
RACE					
AmerIN/AN	White	0.53	0.19	1.47	0.22
Asian/PI	White	0.43	0.15	1.19	0.10
Black	White	0.93	0.84	1.03	0.15
Other/UNK	White	0.96	0.86	1.09	0.55
SEX					
Female	Male	1.09	1.00	1.19	0.041

Table 17 Continued

ACUTE_E. St. Louis			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
< 1 y	25 to 34.9	3.40	3.16	3.66	<.0001
1 to 2.9	25 to 34.9	3.50	3.29	3.74	<.0001
3 to 5.9	25 to 34.9	3.26	3.05	3.48	<.0001
6 to 11.9	25 to 34.9	2.23	2.09	2.37	<.0001
12 to 14.9	25 to 34.9	1.47	1.35	1.60	<.0001
15 to 19.9	25 to 34.9	1.30	1.21	1.39	<.0001
20 to 24.9	25 to 34.9	1.03	0.97	1.11	0.34
35 to 44.9	25 to 34.9	0.86	0.81	0.91	<.0001
45 to 64.9	25 to 34.9	0.65	0.62	0.69	<.0001
65 or older	25 to 34.9	0.50	0.45	0.56	<.0001
RACE					
AmerIN/AN	White	1.11	0.86	1.42	0.43
Asian/PI	White	1.05	0.84	1.31	0.68
Black	White	0.94	0.91	0.98	0.0042
Other/UNK	White	1.00	0.95	1.04	0.88
SEX					
Female	Male	1.12	1.08	1.15	<.0001

ACUTE_Marion HR			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
< 1 y	25 to 34.9	3.45	3.17	3.75	<.0001
1 to 2.9	25 to 34.9	3.85	3.58	4.14	<.0001
3 to 5.9	25 to 34.9	3.29	3.05	3.54	<.0001
6 to 11.9	25 to 34.9	2.11	1.96	2.27	<.0001
12 to 14.9	25 to 34.9	1.06	0.95	1.19	0.28
15 to 19.9	25 to 34.9	1.12	1.04	1.21	0.0046
20 to 24.9	25 to 34.9	1.12	1.04	1.21	0.0029
35 to 44.9	25 to 34.9	0.85	0.79	0.91	<.0001
45 to 64.9	25 to 34.9	0.71	0.67	0.75	<.0001
65 or older	25 to 34.9	0.76	0.70	0.83	<.0001
RACE					
AmerIN/AN	White	0.84	0.61	1.16	0.29
Asian/PI	White	0.69	0.44	1.07	0.095
Black	White	0.96	0.90	1.02	0.20
Other/UNK	White	1.04	0.99	1.10	0.13
SEX					
Female	Male	1.02	0.99	1.06	0.23

Table 17 Continued

ACUTE_Peoria			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
< 1 y	25 to 34.9	3.41	3.05	3.80	<.0001
1 to 2.9	25 to 34.9	3.94	3.56	4.37	<.0001
3 to 5.9	25 to 34.9	3.12	2.80	3.48	<.0001
6 to 11.9	25 to 34.9	1.83	1.64	2.04	<.0001
12 to 14.9	25 to 34.9	1.21	1.04	1.40	0.013
15 to 19.9	25 to 34.9	1.10	0.99	1.22	0.079
20 to 24.9	25 to 34.9	1.08	0.98	1.19	0.11
35 to 44.9	25 to 34.9	0.88	0.80	0.96	0.0053
45 to 64.9	25 to 34.9	0.67	0.61	0.73	<.0001
65 or older	25 to 34.9	0.65	0.55	0.77	<.0001
RACE					
AmerIN/AN	White	0.82	0.51	1.32	0.42
Asian/PI	White	0.92	0.58	1.46	0.73
Black	White	0.99	0.92	1.05	0.69
Other/UNK	White	1.01	0.95	1.09	0.69
SEX					
Female	Male	1.13	1.07	1.18	<.0001

ACUTE_Rockford			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
< 1 y	25 to 34.9	3.25	2.90	3.64	<.0001
1 to 2.9	25 to 34.9	4.18	3.77	4.63	<.0001
3 to 5.9	25 to 34.9	3.53	3.16	3.94	<.0001
6 to 11.9	25 to 34.9	2.44	2.19	2.71	<.0001
12 to 14.9	25 to 34.9	1.54	1.33	1.79	<.0001
15 to 19.9	25 to 34.9	1.15	1.02	1.29	0.021
20 to 24.9	25 to 34.9	1.12	1.00	1.25	0.042
35 to 44.9	25 to 34.9	0.89	0.81	0.98	0.019
45 to 64.9	25 to 34.9	0.72	0.66	0.79	<.0001
65 or older	25 to 34.9	0.61	0.51	0.72	<.0001
RACE					
AmerIN/AN	White	0.74	0.50	1.10	0.14
Asian/PI	White	1.25	0.98	1.59	0.073
Black	White	1.02	0.96	1.09	0.44
Other/UNK	White	1.01	0.95	1.09	0.69
SEX					
Female	Male	1.06	1.01	1.12	0.020

Summary of Population Characteristics Most Associated with Chronic ACSC ED Visits

- Adults age 35 and older in all areas, children and teens in Danvile (age 3–14), children age 3–11 in East St. Louis, and children age 6–11 in Rockford
- Blacks in all areas
- Males in East St. Louis, the Marion Health Region, Peoria, and Rockford

Table 18: Population Characteristics Associated with Chronic ACSC ED Visits (FY2019 and FY2020 Data Combined)

CHRONIC_Danville			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
< 1 y	25 to 34.9	0.18	0.07	0.44	0.0002
1 to 2.9	25 to 34.9	1.14	0.80	1.60	0.47
3 to 5.9	25 to 34.9	1.66	1.19	2.30	0.0026
6 to 11.9	25 to 34.9	2.01	1.51	2.66	<.0001
12 to 14.9	25 to 34.9	1.55	1.04	2.31	0.033
15 to 19.9	25 to 34.9	0.89	0.64	1.24	0.48
20 to 24.9	25 to 34.9	0.87	0.64	1.18	0.38
35 to 44.9	25 to 34.9	1.82	1.46	2.27	<.0001
45 to 64.9	25 to 34.9	3.89	3.21	4.71	<.0001
65 or older	25 to 34.9	4.14	3.12	5.49	<.0001
RACE					
AmerIN/AN	White	0.60	0.14	2.48	0.48
Asian/PI	White	0.46	0.11	1.90	0.28
Black	White	1.31	1.15	1.50	<.0001
Other/UNK	White	0.97	0.77	1.21	0.77
SEX					
Male	Female	1.10	0.98	1.23	0.12

Table 18 Continued

CHRONIC_E. St. Louis Group	Compared To	Odds Ratio	Confidence Interval (95%) Lower Limit	Upper Limit	P-Value
AGE					
< 1 y	25 to 34.9	0.15	0.10	0.21	<.0001
1 to 2.9	25 to 34.9	0.74	0.63	0.87	0.0003
3 to 5.9	25 to 34.9	1.30	1.13	1.50	0.0003
6 to 11.9	25 to 34.9	1.49	1.31	1.69	<.0001
12 to 14.9	25 to 34.9	1.00	0.83	1.20	0.96
15 to 19.9	25 to 34.9	0.99	0.86	1.14	0.87
20 to 24.9	25 to 34.9	1.03	0.90	1.17	0.70
35 to 44.9	25 to 34.9	1.89	1.72	2.08	<.0001
45 to 64.9	25 to 34.9	3.24	2.99	3.53	<.0001
65 or older	25 to 34.9	4.00	3.57	4.47	<.0001
RACE					
AmerIN/AN	White	1.03	0.68	1.55	0.90
Asian/PI	White	1.21	0.85	1.72	0.30
Black	White	1.38	1.30	1.47	<.0001
Other/UNK	White	1.09	0.99	1.20	0.085
SEX					
Male	Female	1.27	1.20	1.33	<.0001

CHRONIC_Marion HR Group	Compared To	Odds Ratio	Confidence Interval (95%) Lower Limit	Upper Limit	P-Value
AGE					
< 1 y	25 to 34.9	0.18	0.12	0.28	<.0001
1 to 2.9	25 to 34.9	0.51	0.40	0.64	<.0001
3 to 5.9	25 to 34.9	0.74	0.60	0.90	0.0033
6 to 11.9	25 to 34.9	0.87	0.74	1.03	0.11
12 to 14.9	25 to 34.9	0.81	0.65	1.01	0.064
15 to 19.9	25 to 34.9	0.63	0.53	0.75	<.0001
20 to 24.9	25 to 34.9	1.26	1.10	1.43	0.0007
35 to 44.9	25 to 34.9	1.46	1.31	1.63	<.0001
45 to 64.9	25 to 34.9	3.15	2.88	3.45	<.0001
65 or older	25 to 34.9	4.64	4.20	5.14	<.0001
RACE					
AmerIN/AN	White	1.51	1.06	2.15	0.024
Asian/PI	White	0.78	0.42	1.43	0.42
Black	White	1.32	1.21	1.45	<.0001
Other/UNK	White	0.88	0.77	0.99	0.037
SEX					
Male	Female	1.20	1.14	1.27	<.0001

Table 18 Continued

CHRONIC_Peoria Group	Compared To	Odds Ratio	Confidence Interval (95%) Lower Limit	Upper Limit	P-Value
AGE					
< 1 y	25 to 34.9	0.11	0.07	0.18	<.0001
1 to 2.9	25 to 34.9	0.38	0.28	0.51	<.0001
3 to 5.9	25 to 34.9	0.86	0.68	1.10	0.23
6 to 11.9	25 to 34.9	1.07	0.87	1.32	0.50
12 to 14.9	25 to 34.9	0.69	0.52	0.92	0.012
15 to 19.9	25 to 34.9	0.88	0.73	1.07	0.19
20 to 24.9	25 to 34.9	0.79	0.66	0.94	0.0088
35 to 44.9	25 to 34.9	1.51	1.32	1.72	<.0001
45 to 64.9	25 to 34.9	2.62	2.34	2.93	<.0001
65 or older	25 to 34.9	3.02	2.57	3.55	<.0001
RACE					
AmerIN/AN	White	0.84	0.41	1.73	0.64
Asian/PI	White	0.71	0.33	1.54	0.39
Black	White	1.35	1.23	1.49	<.0001
Other/UNK	White	0.98	0.86	1.13	0.78
SEX					
Male	Female	1.24	1.15	1.34	<.0001

CHRONIC_Rockford Group	Compared To	Odds Ratio	Confidence Interval (95%) Lower Limit	Upper Limit	P-Value
AGE					
< 1 y	25 to 34.9	0.15	0.09	0.24	<.0001
1 to 2.9	25 to 34.9	0.65	0.51	0.83	0.0007
3 to 5.9	25 to 34.9	1.19	0.96	1.49	0.11
6 to 11.9	25 to 34.9	1.25	1.02	1.52	0.031
12 to 14.9	25 to 34.9	0.92	0.69	1.22	0.55
15 to 19.9	25 to 34.9	0.78	0.63	0.96	0.019
20 to 24.9	25 to 34.9	0.96	0.80	1.15	0.63
35 to 44.9	25 to 34.9	1.68	1.47	1.92	<.0001
45 to 64.9	25 to 34.9	2.80	2.50	3.15	<.0001
65 or older	25 to 34.9	3.35	2.83	3.96	<.0001
RACE					
AmerIN/AN	White	2.14	1.49	3.07	<.0001
Asian/PI	White	1.02	0.69	1.50	0.92
Black	White	1.47	1.35	1.60	<.0001
Other/UNK	White	1.28	1.14	1.45	<.0001
SEX					
Male	Female	1.13	1.05	1.22	0.0009

Summary of Population Characteristics Most Associated with Avoidable ACSC ED Visits

- Adults age 21–64
- Blacks in Peoria and Rockford
- Males in East St. Louis, the Marion Health Region, Peoria, and Rockford

Table 19: Population Characteristics Associated with Avoidable ACSC ED Visits (FY2019 and FY2020 Data Combined)

AVOIDABLE_Danville			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
21 to 34	< 21	5.58	4.34	7.17	<.0001
35 to 44	< 22	4.27	3.26	5.61	<.0001
45 to 64	< 23	1.87	1.39	2.51	<.0001
65 or older	< 24	0.35	0.11	1.12	0.077
RACE					
AmerIN/AN	White	3.17	1.50	6.71	0.0025
Asian/PI	White	0.34	0.05	2.42	0.28
Black	White	1.01	0.86	1.19	0.923
Other/UNK	White	0.88	0.62	1.24	0.451
SEX					
Male	Female	1.08	0.93	1.26	0.327

AVOIDABLE_E. St. Louis			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
21 to 34	< 21	4.18	3.78	4.63	<.0001
35 to 44	< 22	3.44	3.07	3.86	<.0001
45 to 64	< 23	1.47	1.30	1.67	<.0001
65 or older	< 24	0.51	0.36	0.72	0.0001
RACE					
AmerIN/AN	White	0.94	0.56	1.58	0.81
Asian/PI	White	0.28	0.10	0.75	0.011
Black	White	1.03	0.97	1.11	0.35
Other/UNK	White	0.95	0.83	1.09	0.47
SEX					
Male	Female	1.12	1.04	1.19	0.0017

Table 19 Continued

AVOIDABLE_Marion HR			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
21 to 34	< 21	5.81	5.20	6.49	<.0001
35 to 44	< 22	4.28	3.79	4.83	<.0001
45 to 64	< 23	1.72	1.51	1.96	<.0001
65 or older	< 24	0.20	0.13	0.31	<.0001
RACE					
AmerIN/AN	White	0.98	0.61	1.58	0.95
Asian/PI	White	1.15	0.56	2.33	0.71
Black	White	0.99	0.89	1.09	0.79
Other/UNK	White	0.89	0.77	1.03	0.11
SEX					
Male	Female	1.17	1.09	1.25	<.0001

AVOIDABLE_Peoria			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
21 to 34	< 21	4.78	4.03	5.66	<.0001
35 to 44	< 22	3.53	2.92	4.27	<.0001
45 to 64	< 23	1.69	1.38	2.07	<.0001
65 or older	< 24	0.17	0.06	0.46	0.0004
RACE					
AmerIN/AN	White	0.17	0.02	1.19	0.074
Asian/PI	White	0.23	0.03	1.65	0.14
Black	White	1.13	1.01	1.26	0.032
Other/UNK	White	1.20	0.99	1.45	0.064
SEX					
Male	Female	1.38	1.25	1.53	<.0001

AVOIDABLE_Rockford			Confidence Interval (95%)		
Group	Compared To	Odds Ratio	Lower Limit	Upper Limit	P-Value
AGE					
21 to 34	< 21	4.23	3.49	5.13	<.0001
35 to 44	< 22	4.40	3.59	5.40	<.0001
45 to 64	< 23	1.36	1.08	1.71	0.0095
65 or older	< 24	0.48	0.25	0.91	0.026
RACE					
AmerIN/AN	White	0.93	0.44	1.97	0.85
Asian/PI	White	1.10	0.60	2.02	0.75
Black	White	1.19	1.06	1.35	0.0043
Other/UNK	White	0.94	0.77	1.16	0.57
SEX					
Male	Female	1.13	1.01	1.27	0.034

Appendix C:
Approach to Community Input

Members of University of Illinois Chicago's (UIC) Institute for Healthcare Delivery Design (IHDD) and School of Public Health (SPH), in collaboration with Southern Illinois University School of Medicine Center for Rural Health and University of Illinois College of Medicine Rockford Division of Health Research and Evaluation (all entities together the "CI team"), conducted community-input sessions from February through July 2022 in five regions in Illinois: Danville, the Marion Health Region (MHR), Peoria, the Rockford metropolitan region, and West Cook County. The project teams at the academic institutions reached out to community-based organizations (CBOs) that serve vulnerable populationsin each region. Twelve CBOs conducted a total of 24 input sessions and 39 individual interviews. In the end, 230 individuals' voices are represented in the regional reports.

Community-Input (CI) Goals

1. Support the overall Transform initiative through narratives of community members' health and healthcare experiences to inform Illinois Department of Healthcare and Family Services (HFS).
2. Elevate the use of narratives to inform what questions are asked, how findings are interpreted, and what emerging questions need to be investigated in the future.
3. Demonstrate and enhance methods to solicit community input.
4. Uncover emerging issues for potential directions of the Transform project in the future.
5. Empower community-based organizations with community-input solicitation tools and findings to continuously improve the health of socially vulnerable populations in Illinois.

Targeted Regions and Communities

In 2020, the UIC and SIU teams conducted community input in four socially vulnerable areas in Illinois: the South Side of Chicago, the West Side of Chicago, South Cook County, and the East St. Louis Metropolitan Area. HFS published these reports on the HFS website in February of 2021. In 2022, the CI team conducted community input in five additional socially vulnerable areas: Danville, the MHR, Peoria, and Rockford, and West Cook County.

Within the five areas under study, the CI team identified the geographic areas or communities with the most vulnerable populations with respect to accessing healthcare and to health outcomes. They completed the identification of these specific geographic areas in consultation with UIC faculty members: Dr. Vincent Freeman (Associate Professor of Epidemiology and Biostatistics, UIC SPH) and Dr. Matt Sweeney (Senior Research Specialist, UIC Institute for Policy and Civic Engagement). Drs. Freeman and Sweeney used

the CDC Social Vulnerability Index to determine priority zip code areas and/or "meaningful communities" (e.g., Cicero in the West Cook region) for the CI team to focus on.

Once priority zip codes were identified, the CI team identified groups of community members in each geographic community who demonstrated characteristics that were priorities of the HFS Transformation program (racial/ethnic groups, women of reproductive age, people with multiple chronic diseases, older adults, people with disabilities, family caregivers, etc.). The team used these population groups to inform the identification of and outreach to potential community partners.

Identifying Community Partners

The CI team identified CBOs that provide services to vulnerable community members with the previously described characteristics. To do this, they used multiple sources of information—including existing health assessments, databases, and resource lists, as well as preexisting connections, referrals from other community-organizations, and internet searches. They excluded healthcare organizations, to ensure the participants would include individuals who face challenges accessing healthcare. The CI team from each region contacted potential partner CBOs and scheduled meetings with organizations to describe the project, including roles and expectations for the CBOs and the CI team. The interested CBOs then entered a formal partnership with the university. For each interested CBO, the CI team developed a scope of work outlining roles for each party along with a contract between UIC and each partner organization. Because most of the CBOs recruited participants, collected data, provided incentives to participants, and engaged in other activities, the contracts stipulated that UIC would compensate the organizations for their time and the cost of the participant incentives.

Community Partner Training

The CI team provided a series of training sessions to the staffs of the partner CBOs to prepare them for the community-input sessions. This unique feature of UIC's community-input process was intended to enhance both the capacity of the CBOs (see the "Goals" section, above) and their input-session-facilitation skills. The training included participant-recruitment and focus-group facilitation practices. The CBO staff were able to practice their skills during the training sessions, which were held either in person or online. To allow CBO staffers to revisit training topics and to share information with staff members unable to attend the live training, the training sessions were recorded.

The Social or Structural Drivers of Health Framework

The CI team developed a conceptual framework which integrated the key concepts of the social drivers of health, access to healthcare, and healthcare quality. These provided a common framework for developing discussion guides, the codebook, and data analysis and interpretation in all 5 regions. The framework also allowed flexibility for each region to adapt

its community-input strategy to regional variations and to discover and highlight findings that were unique to the region.

Community-Input Focus Groups Led by the CBOs

After training was completed, the partner CBOs scheduled community-input sessions, recruited participants, and conducted the focus-group sessions. All participants received a gift-card incentive to thank them for participating in a community-input session.

Participant Recruitment. To leverage the community partners' networks of readily available existing relationships, a convenience sampling (a type of non-probability sampling) was taken, using flyers and other promotional materials created by the CI team to recruit session participants. The convenience-sampling approach had the advantage of using the CBOs' existing relationships with community members to recruit community-input participants and to establish some trust with them. A key limitation of convenience sampling is the possibility that people who are not part of the CBO's network could be underrepresented in the sample. This situation limits the ability to make generalizations about residents of the community as a whole. However, in 3 of the 5 regions (Peoria, Rockford, West Cook), partnering with multiple CBOs helped to mitigate this limitation.

Implementation of Community-Input Sessions. Community-partner staffers conducted most of the community-input sessions, using the discussion guide developed by the CI team. The CI team provided technical and note-taking support. However, some CBOs indicated they had insufficient capacity to conduct sessions. In those cases, the UIC team conducted the community-input sessions. The sessions were conducted either in-person or via Zoom, depending on CBO and community preferences as well as COVID-19 restrictions at the time of the sessions. In addition to having a note taker present, all the community-input sessions were audio recorded.

Regional Adaptations of the Protocol and Procedures. The CBOs were allowed to adapt the standard protocol developed by UIC to fit their own communities (e.g., to adjust the community-member recruitment strategy, vary the number of participants in an input session, and have either virtual or in-person sessions).

Languages. To maximize the inclusion of multiple perspectives, focus groups were conducted in 3 languages other than English – as needed (or requested) by the local organizations. The CI team translated the focus-group guide in advance. In all, 2 CBOs conducted 10 sessions in languages other than English:

- **Erie House,** in West Cook County, conducted 7 sessions in Spanish.
- **Winnebago Emerging Small Business Services**, in Rockford, conducted 1 session

in Spanish, 1 session in Dari (with Afghani immigrants), and 1 session in Swahili (with Congolese immigrants).

Sessions were facilitated by persons fluent in the relevant language. One session in Rockford was co-facilitated by an English-speaking staff person and a person from the community who was fluent in the non-English language. For the Spanish-language and Swahili-language sessions, focus-group recordings were transcribed in their original language and then translated into English for coding and analysis. For the Dari-language session, translation back to English was conducted in real time and notes were captured in English.

Individual Interviews. In Rockford, individual interviews were conducted with 39 community members. Interviews were done for a range of reasons, including limited access to technology for some priority populations, which would have restrict their ability to participate in a Zoom session; an uptick in COVID-19 infections, which restricted in-person gatherings; and the desire to elicit community input from community members who, for health or logistics reasons, were unable to participate in a 90-minute focus group.

Data Management and Analytic Strategy

The community-input sessions' recordings were automatically transcribed using voice-recognition software and corrected by a member of the CI team. The CI team created a codebook using the Social and Structural Drivers of Health Framework that was used to create the focus-group discussion guide. Like the discussion guide, the codebook covered key concepts of the social drivers of health, access to healthcare, and healthcare quality. A subset of CI team members tested and modified the codebook. Once the codebook was finalized, a member of the CI team held 2 training sessions to describe the coding process.

Using the codebook, CI team members coded transcripts, created memos, and reviewed notes to analyze the participants' experiences related to health and healthcare in their communities. Through this analytic process, each regional team identified key themes and summarized its findings in the areas of healthcare access, healthcare quality, and other thematic areas related to social determinants of health or community recommendations to address them. All these findings were then compiled into a separate, final community-input report for each region.

In addition, representative participant quotations and stories were pulled and curated to ground the research findings and bring out the human perspective. Through member-checking, the community partners were asked to offer feedback on the data analysis and thematic findings in draft summary reports. Upon publication of this report, community partners will disseminate the project objectives and findings to resident participants and their broader networks of stakeholders.

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