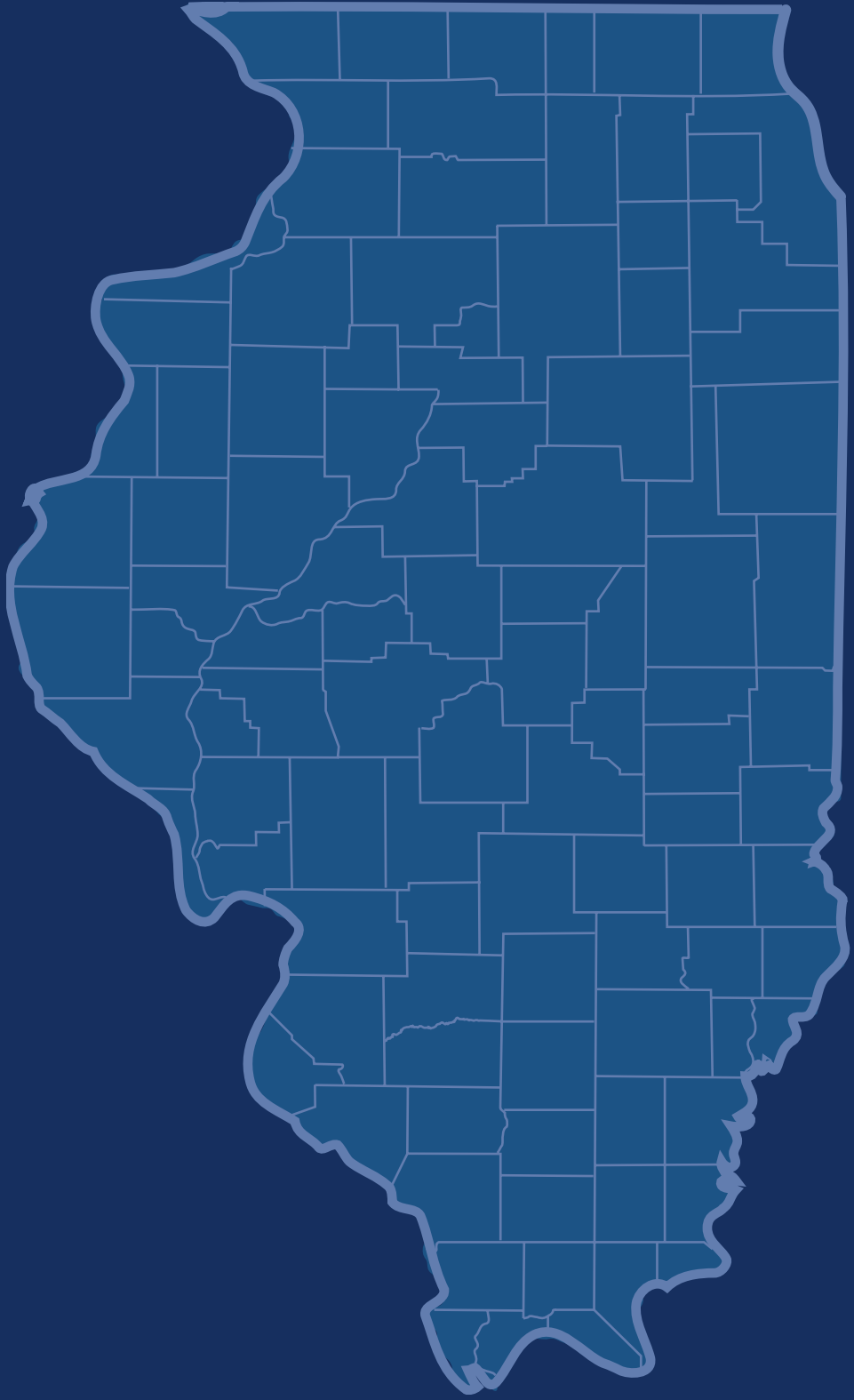

Transformation Data & Community Needs Report: East St. Louis Metro Area

February 2021

This report was prepared by the University of Illinois at Chicago School of Public Health and Institute for Healthcare Delivery Design for the Illinois Department of Healthcare and Family Services. This report details the findings and methods for a study we conducted to understand healthoutcomes and community needs in 5 of the most socially vulnerable areas in the State of Illinois.

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Executive Summary

Healthcare policies enacted during the last 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 demographic information, resources mapping, and input from 252 participants 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, bipolar and depressive disorders.

Access to quality primary and specialty care is critical to decreasing hospital-level care

for ACSCs, mental illness and substance use disorders. However, as this report highlights, there's a lack of access to this care for vulnerable populations. This lack of access is driven by both resource gaps and by social, economic, and other "social determinants of health" barriers that people face in achieving health (for example, lack of access to transportation; lack of access to affordable, healthy food; unemployment; community violence; etc.). In other words, this is a problem that sits within both the healthcare system and within 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, findings of this report 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 secondary care plus community-based wraparound services to help people manage chronic illnesses, mental illnesses and substance use disorders and reduce social-determinants-of-health barriers to care and treatment. **Improving health outcomes for these diseases and conditions can only be achieved 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 overtime. 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 stakeholder groups to 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 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 5 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 these 5 areas and discovered a set of disease groups and conditions for which access to quality outpatient care can prevent the need for hospitalization.

3: Investigated levels of outpatient care for patients hospitalized with the identified disease groups and conditions and found low levels of outpatient care, both before and

after hospitalization, indicating a crucial lack of access to outpatient care.

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

5: Reviewed healthcare resources in the 5 study areas and found gaps that could contribute to greater incidence of hospitalization for key disease groups and conditions.

6: 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 East St. Louis Metro Area.

Detailed Findings

1: Identified 5 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 counties 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 initial set of 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.

The initial set of areas identified were Cook County and the East St. Louis Metro Area (St. Clair and Madison counties). Due to its population size and complexity, 4 regions within Cook County of special concern were delineated: South Chicago, West Chicago, South Cook, and West Cook. Research for this project focused on these 5 "study areas" (4 regions in Cook County and the East St. Louis Metro Area, see Figure 1 and Table 1). The East St. Louis Metro Area is the focus of this report.

(Note: Figure 2 illustrates the demographic traits of all the community areas under study.)

Figure 1: Study Areas

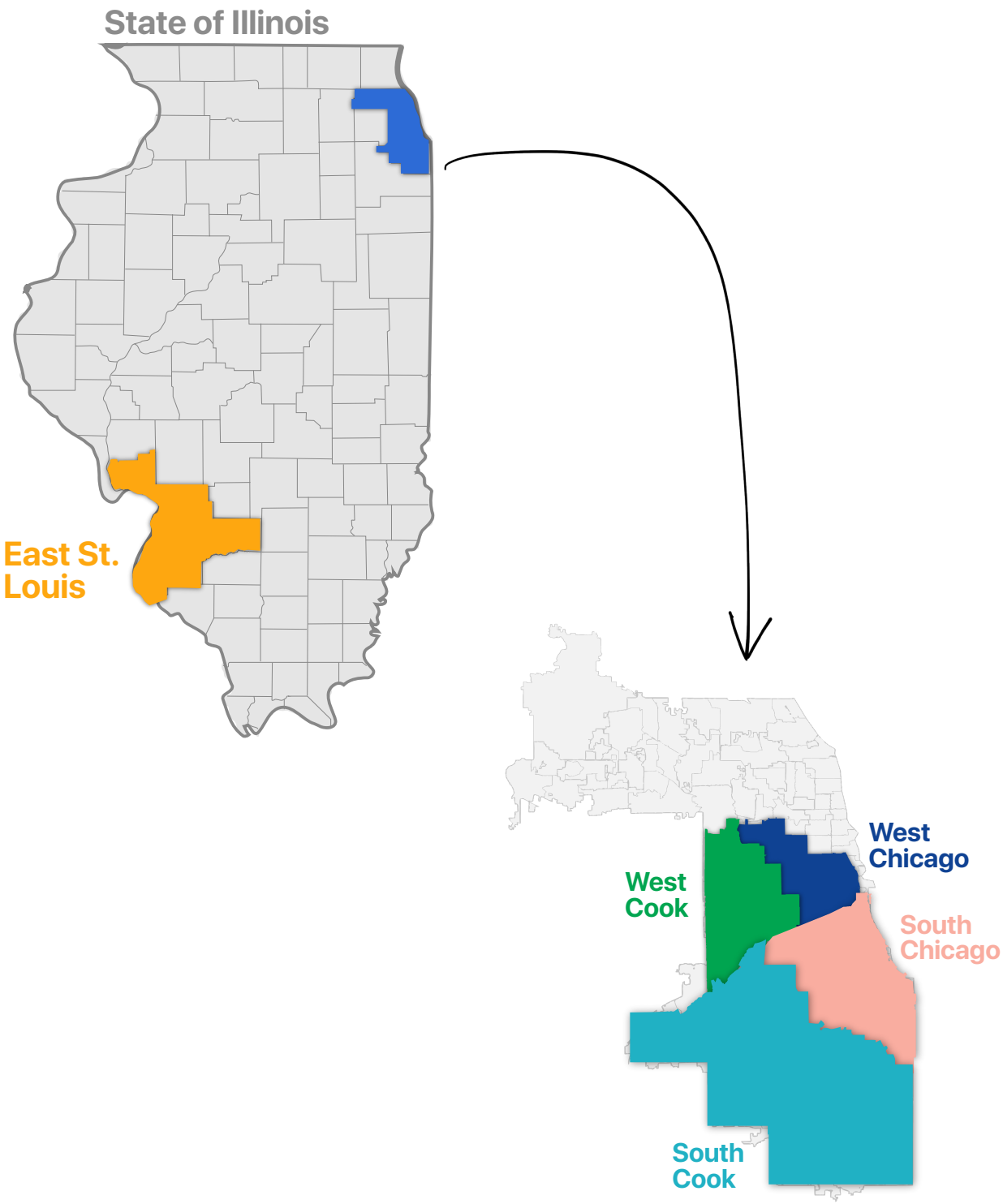


Table 1: Study Areas Defined by Zip Codes

West Chicago Zip Codes				
60608	60622	60624	60639	60644
60612	60623	60634	60642	60651

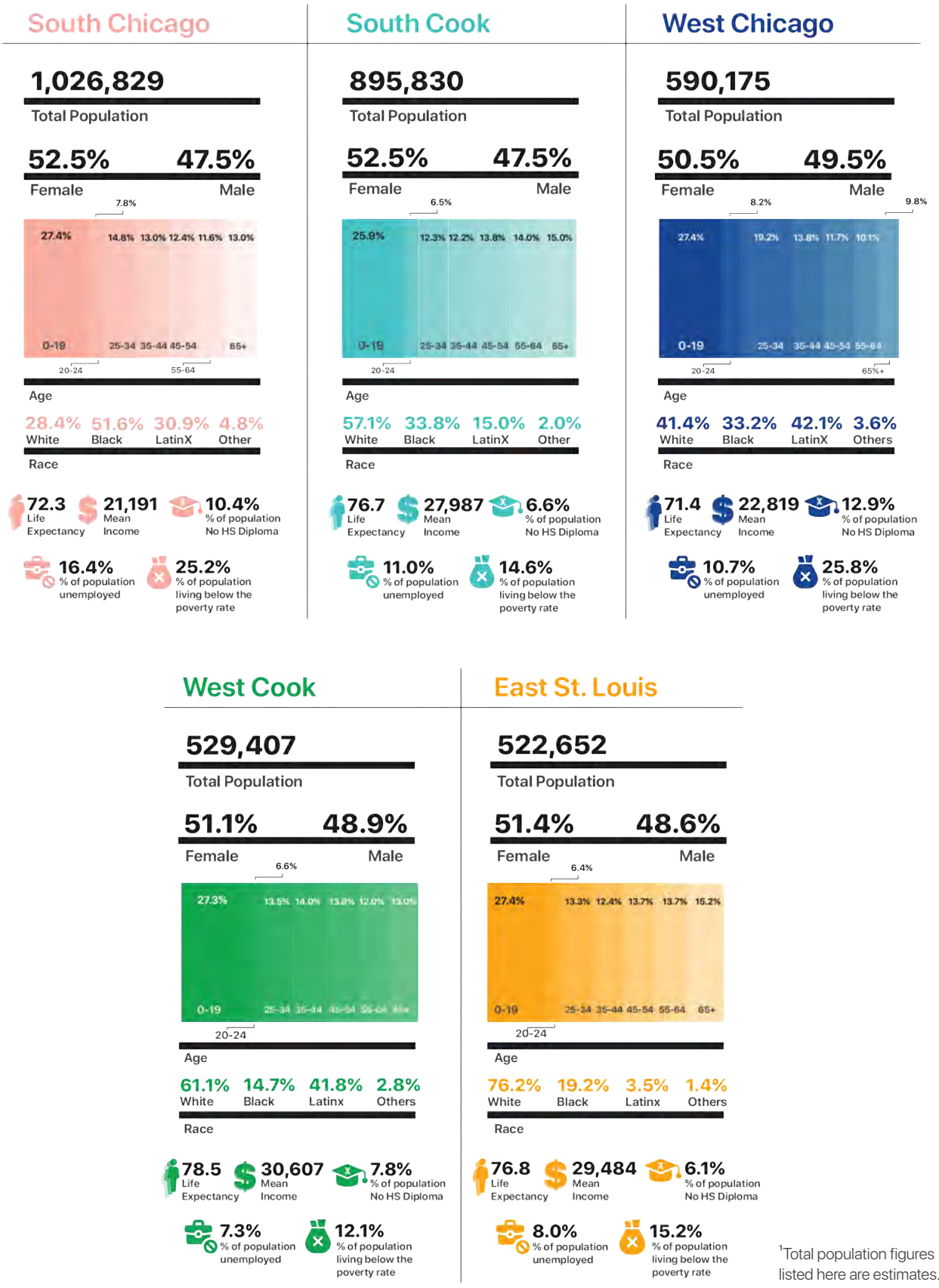
South Chicago Zip Codes				
60609	60619	60629	60636	60652
60615	60620	60631	60638	60653
60616	60621	60632	60643	60655
60617	60628	60633	60649	

South Cook Zip Codes				
60406	60429	60456	60466	60478
60409	60430	60457	60467	60480
60411	60438	60458	60469	60482
60415	60439	60459	60471	60487
60419	60443	60461	60472	60501
60422	60445	60462	60473	60803
60425	60452	60463	60475	60805
60426	60453	60464	60476	60827
60428	60455	60465	60477	

West Cook Zip Codes				
60104	60155	60171	60402	60707
60130	60160	60176	60513	60804
60131	60162	60301	60525	
60141	60163	60302	60526	
60153	60164	60304	60534	
60154	60165	60305	60558	

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

Figure 2: Demographic Traits of Study Areas[1]



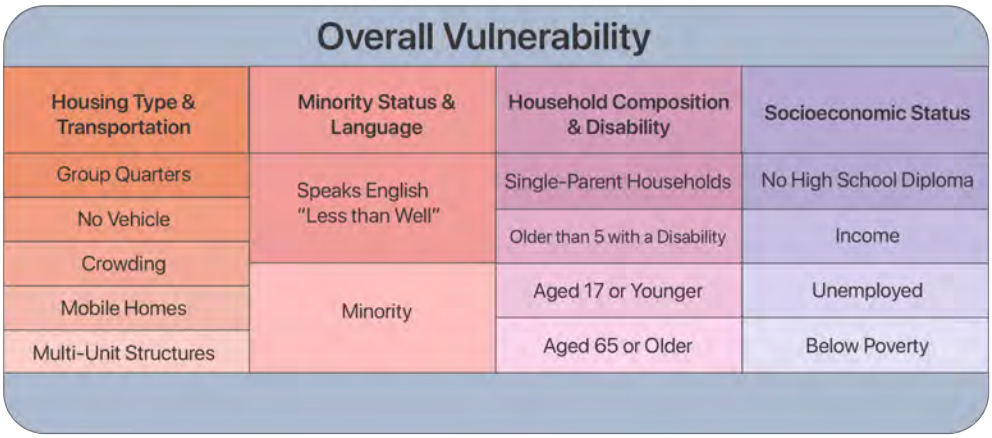
[1]Total population figures listed here are estimates.

Additional areas of high social vulnerability among the remaining Illinois counties were identified 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 "4. Marion Health Region" 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 fifteen 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 estimates 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. They are 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.

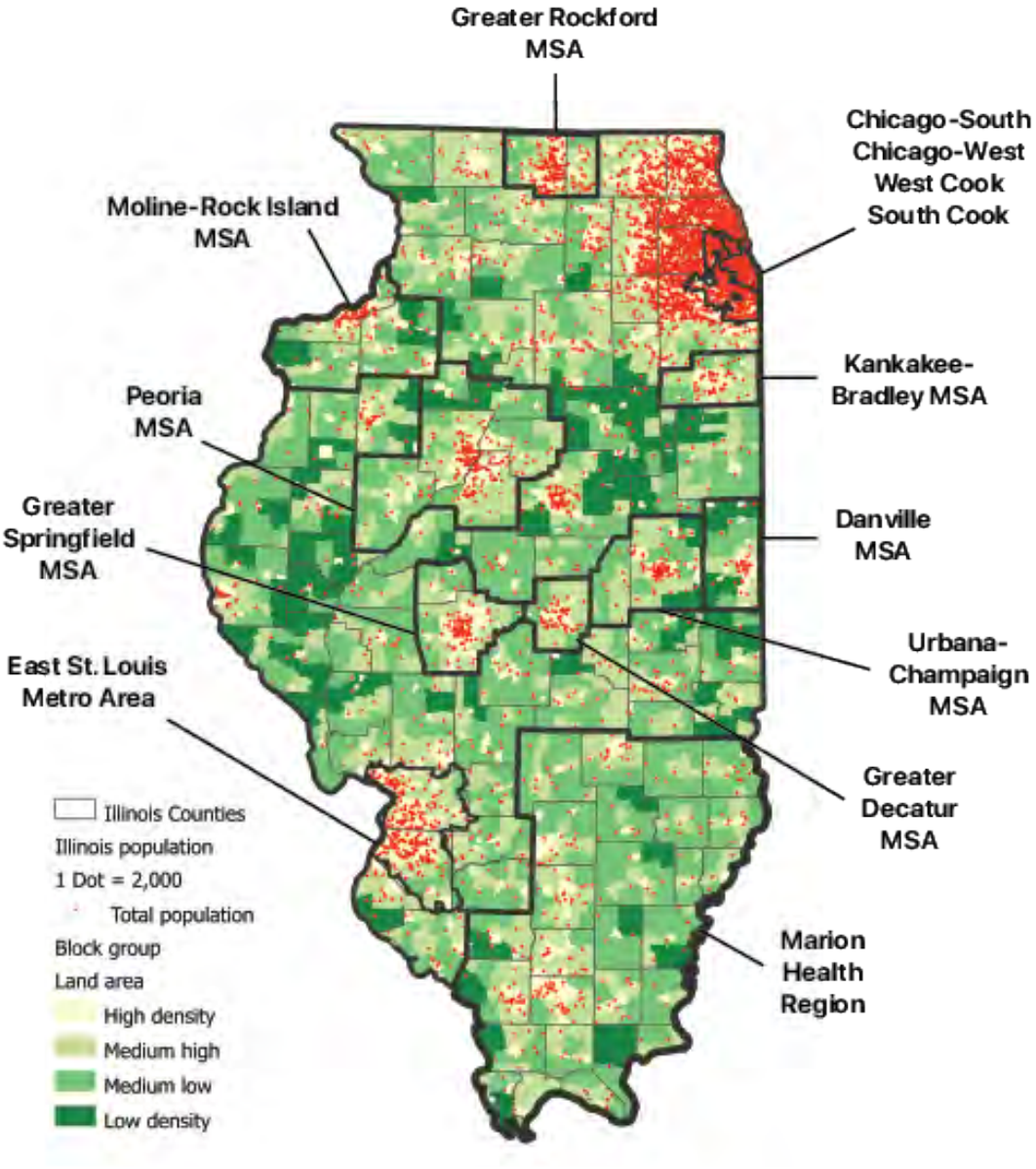
3. *Geographical areas ranked based on CDC-SVI percentile scores:* Geographical areas were ranked based on CDC-SVI percentile scores. Areas with scores > 50 (“above average”) [n=35] were designated as potential priority locations for additional analyses (see Figure 4).

4.*Marion Health Region:* The Marion Health Region (MHR), one of the 7 Illinois Department of Public Health (IDPH) Regions, is located in the south/southeast section of the state (11). The MHR 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 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.

5. *Most socially vulnerable areas identified using zip code-level data:* Lastly, 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 2). 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 in Table 2).

East St. Louis, South Chicago, West Chicago, South Cook and West Cook and had the highest population-weighted social vulnerability scores in the state and were selected as the 5 study areas for this research.

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 4.

Table 2: Statewide Scan of Areas in Illinois with Above Average (> 50th Percentile) Social Vulnerability Scores

1. Areas from UIC Study [5]

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 ("most vulnerable")*
Chicago–South	1,026,829	87.6			**60621, 60636, 60637**
Chicago–West	590,175	83.5			**60623, 60624, 60644**
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**
Total	3,617,041				

2. Metropolitan Statistical Areas (MSA) [8]

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
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
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	1,639,644				

3. 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				

4. Marion Health Region (MHR)

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 MHR 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)

Lastly, a bolded zip code means that is also designated as being disproportionately impacted area (DIA) due to Covid-19 by the IL DCEO 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 5 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 5 areas of Illinois were determined for the study, 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 the 5 study areas, FY2018 Medicaid patient-level utilization data was analyzed.

3 data sets were analyzed: an "institutional" data set, a "noninstitutional" data set and a "recipient file" data set. The institutional data set contained Medicaid recipients' healthcare encounters (inpatient admissions, outpatient visits, and emergency department 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 date
- ICD-10 code and description (principal diagnosis for the encounter)
- DRG code (diagnosis related group)

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: Analysis of the noninstitutional data set was constrained as a result of a) the limited nature of variables for provider type/description and b) some provider zip codes indicating billing addresses rather than service-site addresses. For more details, see the "Limitations and Opportunities for Future Research" section of this report.)

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

Collectively, these data sets represent healthcare encounters for FY2018 for all Medicaid recipients living within the zip codes of the study areas defined in this study (specifically, all recipients with home zip codes within the study areas)—in other words, the data track healthcare utilization by Medicaid recipients living in the study areas, regardless of where that care took place.

Key to analyzing the data was categorizing ICD-10 codes, the principal diagnosis for a healthcare encounter. There were more than 17,000 unique ICD-10 codes in the data. To bucket these diagnoses 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; see Section I.C. for the tabular list of diseases and injuries). This structured list of diagnosis codes is divided into 21 chapters based on body system or condition. Each chapter contains disease or injury block and the 1CD-10 codes that make up those blocks (so the hierarchy is ICD-10 code > block > chapter). The **CMS ICD-10-CM Tabular List of Diseases and Injuries chapters 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 liveborn infants)	Z00-Z99

Initial Analyses
After getting to know the data sets via review of fields, 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 statics.

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 gender by study area) and market share of hospitals receiving Medicaid patients by study area (see Appendix 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. Childbirth was the most frequent driver of hospital utilization and, for the most part, these childbirth encounters were normal or relatively uncomplicated. Following childbirth, the next most frequent hospital-level encounters included mental disorders, respiratory diseases and circulatory diseases (see Figures 5–6).

In Figure 6, the top most frequent hospitalization blocks for the East St. Louis Metro Area contain 3 labor and delivery / childbirth blocks: complications of labor and delivery, maternal care related to the fetus and amniotic cavity and possible delivery problems, and obstetric complications not elsewhere classified. These blocks point to complications related to labor and delivery. In a future phase of work, maternal and child health issues will be analyzed further. However, looking at the frequency of the ICD-10 codes that make up these disease blocks, many of the complications are mild and some are even common issues. For example, in East St. Louis, the most frequent complication is first and second degree perineal lacerations during delivery, a common, treatable occurrence during childbirth (see Figure 7).

Otherwise, the top most frequent hospitalization blocks for East St. Louis are related to mental disorders (mood [affective] disorders and schizophrenia-related disorders), mental and behavioral disorders due to psychoactive substance use (or, stated more simply, substance use disorders), and other bacterial diseases (in particular, sepsis).

Pairing Frequency Data with "Severity" Data (Resource Intensiveness)
To provide a more detailed understanding of health outcomes, disease frequency data was paired with severity data based on utilization. Utilization severity was defined as resource intensiveness and 3 measures of resource intensiveness were constructed from the data: length of stay, early readmission, and readmission.

Length of Stay: Length of stay (LOS) was defined as the duration, in days, between the admission date and the discharge date per patient hospital visit. In other words, LOS (days) equals discharge date – admission date + 1. The average of LOS was calculated as the average among all patients and all visits per disease block.

Early Readmission: Early readmission was defined as a binary variable (1 vs. 0) for each patient per disease block. The number 1 was assigned to a patient encounter in which

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

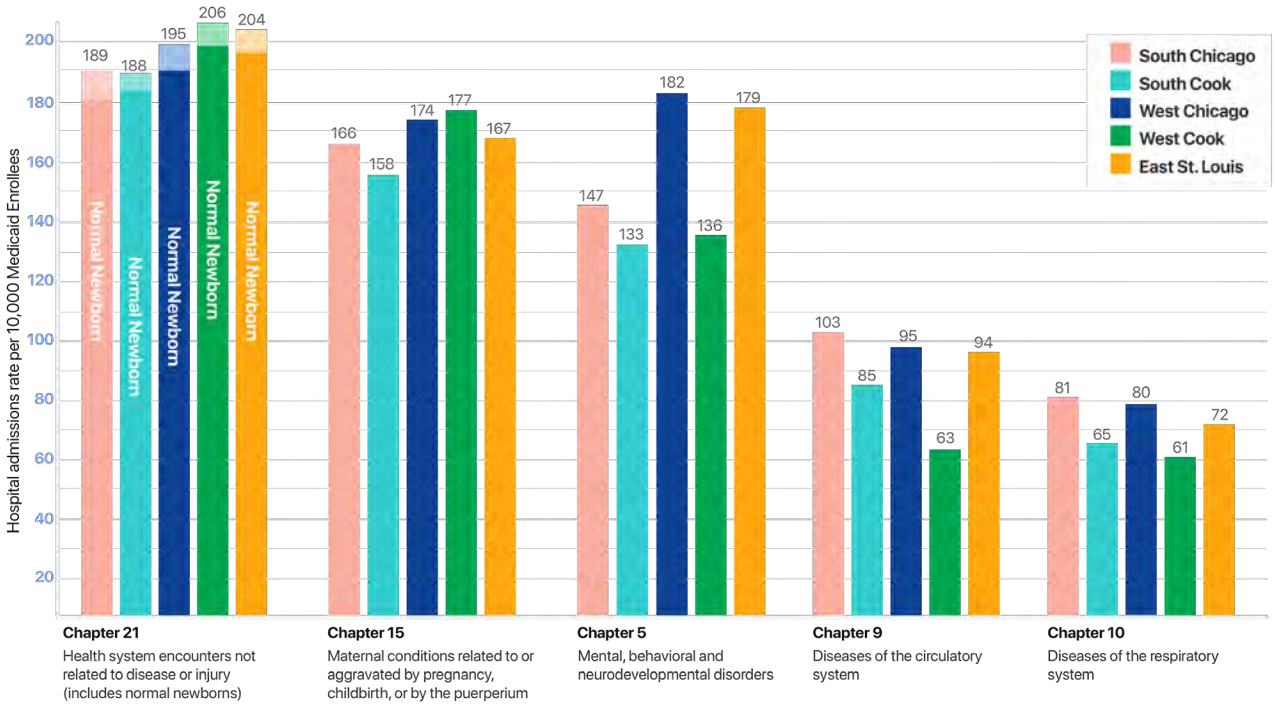


Figure 6: Top 7 Most Frequent Inpatient Hospitalization Blocks by Study Area

(Frequency expressed as rate per 10,000 Medicaid Enrollees; these figures do not include Chapter 21 blocks, which include blocks for normal childbirth)

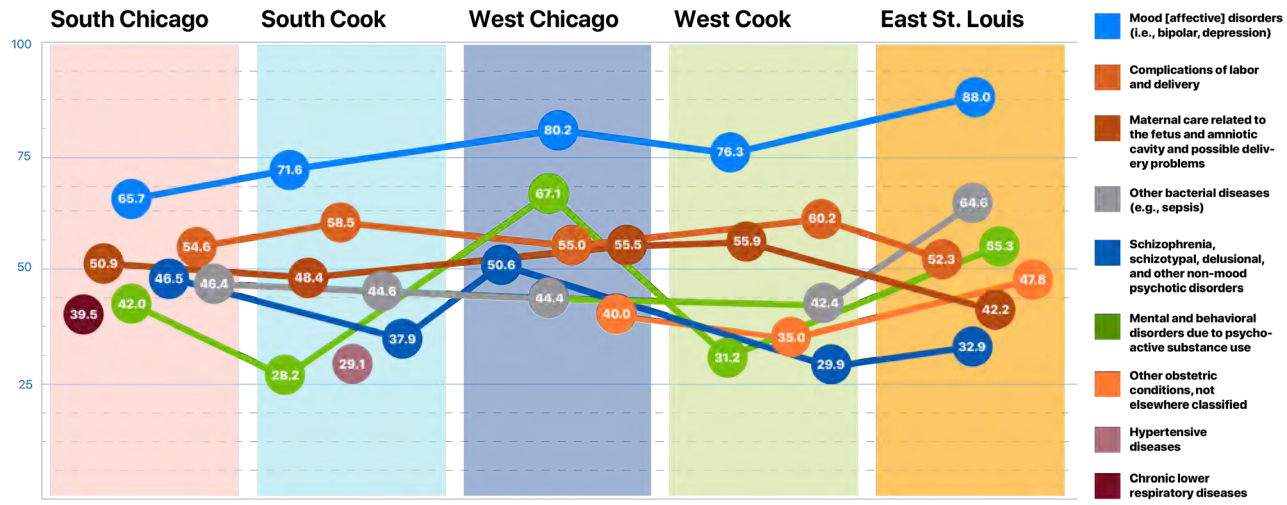
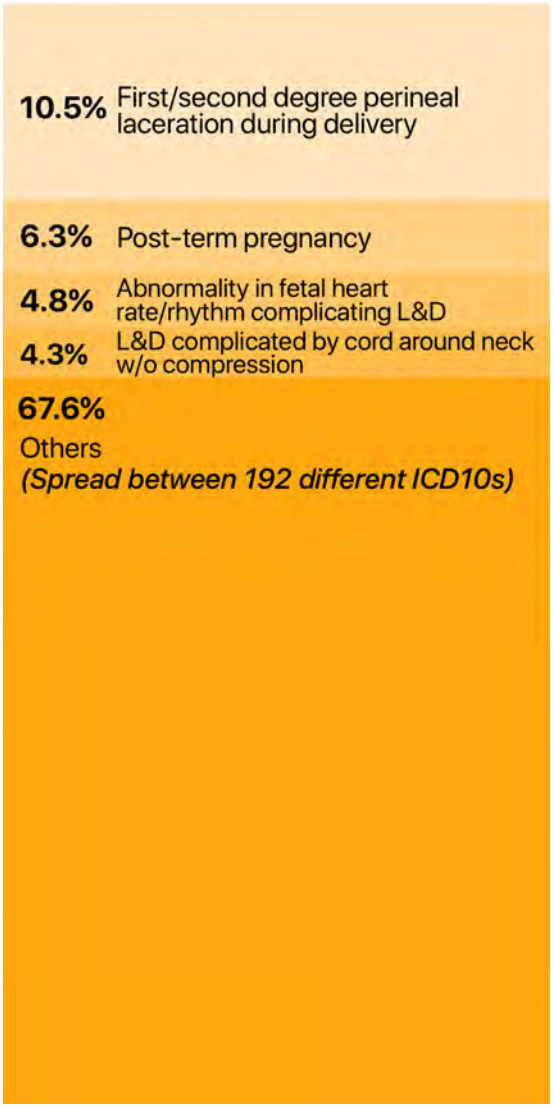


Figure 7: Distribution of ICD-10s of Top Childbirth Complications Blocks[1] for the East St. Louis Metro Area



[1]Top childbirth complication blocks: complications of labor and delivery; maternal care related to the fetus and amniotic cavity; other obstetric conditions.

there was a previous inpatient hospitalization for the same disease block and the discharge date for the initial encounter was within 30 days (≤30) of the admission date of the current encounter. If there were no previous encounters or a previous encounter was greater than 30 days prior, the record was identified as 0. Using this event variable, average early readmission rates were calculated for disease blocks. The calculation for average early admission for a disease block is the equivalent to the proportion of patients who had an early admission per disease block.

Readmission: Readmission was defined for each patient per disease block based on the total number of 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. So, if a patient in a particular disease block only had 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.

Resource intensiveness rates were cross-tabulated with frequency rates by disease block in each study area. Isolating the top fourth ("quartile") or top sixth ("sextile") disease blocks for both of these measures produces a view of the most frequent and resource-intensive disease blocks.

Frequency by Length of Stay: In the East St. Louis Metro Area, the top most frequent and resource-intensive hospitalizations, with resource intensiveness defined as average length of hospital stay, were for schizophrenia, cerebrovascular diseases and behavioral and emotional disorders with onset in childhood or adolescence (see Table 3).

Frequency by Early Hospital Readmissions: For East St. Louis, the top most frequent and resource intensive hospitalizations, with resource intensiveness defined here as early hospital readmissions, were mood [affective] disorders (made up primarily of bipolar and depressive disorders), schizophrenia and cerebrovascular disease (see Table 4).

Table 3: Disease Blocks in the Top Quartile[1] for Both Frequency Rate and Average Length of Hospital Stay[2]

Mental illnesses **Substance use disorders** **ASCSs**

South Chicago	South Cook	West Chicago	West Cook	East St. Louis
Other bacterial diseases	Schizophrenia, schizotypal disorders	Other bacterial diseases	Mood [affective] disorders	Schizophrenia, schizotypal disorders
Cerebrovascular diseases	Other bacterial diseases	Cerebrovascular diseases	Schizophrenia, schizotypal disorders	Cerebrovascular diseases
Malignant neoplasms of digestive organs	Cerebrovascular diseases	Injuries to the abdomen, lower back, lumbar spine, pelvis and external genitals	Other bacterial diseases	Behavioral and emotional disorders with onset usually occurring in childhood and adolescence
Injuries to the abdomen, lower back, lumbar spine, pelvis and external genitals	Injuries to the head	Malignant neoplasms of digestive organs	Cerebrovascular diseases	Injuries to the head
Spondylopathies	Lung diseases due to external agents	Disorders of adult personality and behavior	Anxiety, dissociative, stress-related, somatoform and other nonpsychotic mental disorders	Lung diseases due to external agents
Malignant neoplasms of respiratory and intrathoracic organs	Malignant neoplasms of digestive organs	Diseases of arteries, arterioles and capillaries	Injuries to the head	
Disorders of adult personality and behavior	Injuries to the abdomen, lower back, lumbar spine, pelvis and external genitals	Spondylopathies	Lung diseases due to external agents	
			Malignant neoplasms of digestive organs	

[1] Quartile refers to the top fourth of disease blocks for both frequency and length of stay, representing ~25% of all disease blocks.
[2] This analysis excludes Ch. 21 which contains encounters with the healthcare system not related to injury or disease, including normal, newborns.

Frequency by Hospital Readmissions: Readmissions within the same disease block were the most common occurrence, compared to early readmissions and lengthy hospital stays. In East St. Louis, the 2 disease groups comprising the greatest percentage of readmissions and resource intensive hospitalizations were mental illnesses (mainly mood [affective] disorders and schizophrenia) and substance use disorders. A third grouping from among the largest remaining contributors to readmissions and resource use was organized around a set of chronic illnesses identified as "ambulatory care sensitive conditions" (ACSCs). See Table 5. By definition, ACSCs are health

Table 4: Disease Blocks in the Top Sextile[1] for Both Frequency Rate and Average Hospital Early Readmission Score[2]

Mental illnesses **Substance use disorders** **ASCSs**

South Chicago	South Cook	West Chicago	West Cook	East St. Louis
Mood [affective] disorders	Mood [affective] disorders	Mood [affective] disorders	Mood [affective] disorders	Mood [affective] disorders
Schizophrenia, schizotypal disorders	Schizophrenia, schizotypal disorders	Schizophrenia, schizotypal disorders	Schizophrenia, schizotypal disorders	Schizophrenia, schizotypal disorders
Hypertensive diseases	Cerebrovascular diseases	Cerebrovascular diseases	Cerebrovascular diseases	Cerebrovascular diseases
Diabetes mellitus	Hemolytic anemias	Complications of surgical/ medical care	Complications of surgical/ medical care	Hemolytic anemias
Cerebrovascular diseases	Diseases of liver	Hemolytic anemias	Ischemic heart diseases	
Complications of surgical/ medical care		Injuries to the head	Diseases of liver	
Hemolytic anemias		Diseases of liver	Injuries to the head	
Ischemic heart diseases				
Injuries to the head				
Diseases of liver				

[1] Sextile refers to the top sixth of disease blocks for both frequency and early readmission, representing ~16.67% of all disease blocks.
[2] This analysis excludes Ch. 21 which contains encounters with the healthcare system not related to injury or disease, including normal, newborns.

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 (again, made up primarily of bipolar and depressive disorders) and mental and behavioral disorders due to psychoactive substance use (primarily, alcohol and opioid use disorders), 2 other top frequent and resource-intensive drivers of hospitalizations.

Given this, these 3 frequent, resource-intensive and outpatient-treatable disease groups and conditions became the focus of the research:

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

Table 5: Disease Blocks in the Top Sextile[1] for Both Frequency Rate and Average Hospital Readmission Score[2]

Mental illnesses **Substance use disorders** **ASCSs**

South Chicago	South Cook	West Chicago	West Cook	East St. Louis
Mood affective disorders (bipolar, depression)	Mood affective disorders (bipolar, depression)	Mood affective disorders (bipolar, depression)	Mood affective disorders (bipolar, depression)	Mood affective disorders (bipolar, depression)
Schizophrenia, schizotypal disorders	Schizophrenia, schizotypal disorders	Schizophrenia, schizotypal disorders	Schizophrenia, schizotypal disorders	Psychoactive substance use disorders (alcohol, opioids)
Psychoactive substance use disorders (alcohol, opioids)	Psychoactive substance use disorders (alcohol, opioids)	Psychoactive substance use disorders (alcohol, opioids)	Other bacterial diseases (sepsis)	Schizophrenia, schizotypal disorders
Hypertensive diseases	Hypertensive diseases	Chronic lower respiratory diseases (asthma, COPD)	Psychoactive substance use disorders (alcohol, opioids)	Hypertensive diseases
Chronic lower respiratory diseases (asthma, COPD)	Chronic lower respiratory diseases (asthma, COPD)	Hypertensive diseases	Chronic lower respiratory diseases (asthma, COPD)	Diabetes mellitus
Diabetes mellitus	Diabetes mellitus	Diabetes mellitus	Hypertensive diseases	Hemolytic anemias
Cerebrovascular diseases	Cerebrovascular diseases	Cerebrovascular diseases	Diabetes mellitus	Child/adolescent behavioral & emotional disorders
Complications of surgical/ medical care	Complications of surgical/ medical care	Complications of surgical/ medical care	Cerebrovascular diseases	Noninfective enteritis and colitis
Hemolytic anemias	Hemolytic anemias	Hemolytic anemias	Complications of surgical/ medical care	
Other forms of heart disease	Diseases of liver	Diseases of liver	Diseases of liver	
Diseases of liver				

[1] Sextile refers to the top sixth of disease blocks in for both frequency and readmission, representing ~16.67% of all disease blocks.
[2] The analysis above excludes Chapter 21 of CMS' Tabular list of Diseases and Injuries, which contains encounters with the healthcare system not related to injury or disease, including normal, newborn babies.

3: Investigated levels of outpatient care for patients hospitalized with the identified disease groups and conditions and found low levels of outpatient care, both before and after hospitalization, indicating a crucial lack of access to outpatient care.

Since all of the selected disease groups and conditions can be managed with appropriate outpatient care, an analysis was done to understand outpatient care utilization among Medicaid enrollees who had received hospital-level care (ED visits or inpatient hospitalizations) for these disease groups.

(Note: Outpatient care encounters sit in both the institutional data [outpatient care encounters within hospital/medical center system] and the noninstitutional data [outpatient care encounters with independent healthcare providers]. Encounters from both these data sets were combined for this analysis and all outpatient encounters were used, whether related to the hospitalization diagnosis or not. The results presented in Figures 8–10 can thus be considered a conservatively generous estimate of outpatient care for those with selected and preventable inpatient admissions or ED visits.)

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.

To look for outpatient care evidence subsequent to hospital-level care, patients who had an initial hospitalization or ED visit for mental disorders, substance use disorders or ACSCs in the *first* 3 quarters of FY2018 (07/01/2017 to 03/31/18) were identified. The proportion of these patients who had outpatient care encounters within 3 months *after* their hospital admission date or ED visit was then tabulated.

The result of this analysis shows that *outpatient care prior to or subsequent to hospital-level care is proportionally low in all key disease groups and conditions*, indicating that many patients who were hospitalized for these diseases or disorders did not engage in outpatient care to manage their conditions (see Figures 8–10).

Prior or Subsequent Outpatient Care for Mental Disorder Hospitalizations: For Medicaid patients in the East St. Louis area who went to the ED or were hospitalized for mental disorders, only 12.0% received outpatient care within 3 months prior to hospital-level care and only 15.5% received outpatient care within 3 months after hospital-level care (see Figure 8). This second figure, outpatient care within 3 months after hospital-level care, 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).

Prior or Subsequent Outpatient Care for Psychoactive Substance Use Disorders Hospitalizations: In comparison to all other study areas, East St. Louis has the lowest proportions of substance use disorder patients who received prior or subsequent outpatient care, with only 16.3% receiving

prior care and 29.0% receiving subsequent care (see Figure 9).

Prior or Subsequent Outpatient Care for ACSCs: East St. Louis has the second lowest rate of outpatient care before an ED visit or hospitalization for ACSCs, with only 19.6% of patients receiving prior care. East St. Louis has the lowest rate of outpatient care after an ED visit or hospitalization for ACSCs, with only 29.5% receiving subsequent outpatient care (see Figure 10).

The low rates of outpatient care observed prior to and following hospitalizations and ED visits motivate an interest in improved care for ACSCs, but it is possible to more directly link hospital use to the lack of preventive care in East St. Louis 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) (16).

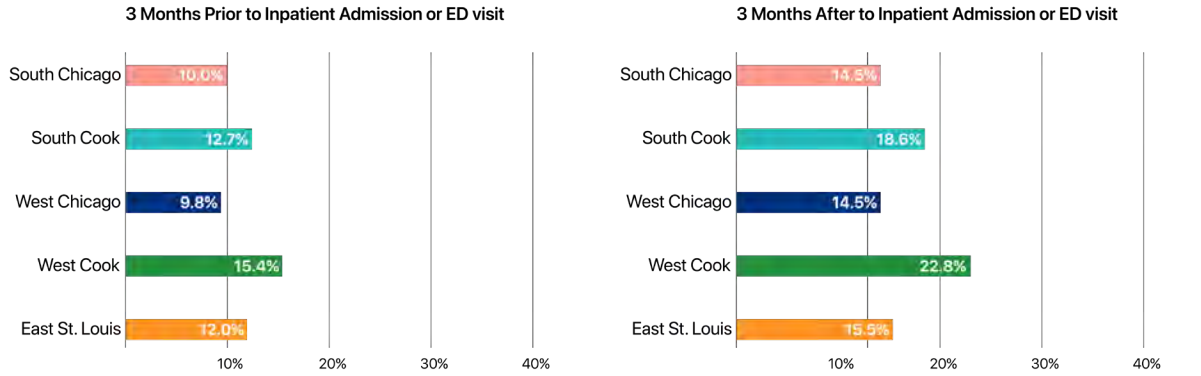
The PQIs consist of the following 11 disease-specific ACSCs, which are measured as rates of admission to the hospital:

- Diabetes, Short-Term Complications Admission Rate
- Diabetes, Long-Term Complications Admission Rate
- Uncontrolled Diabetes 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:

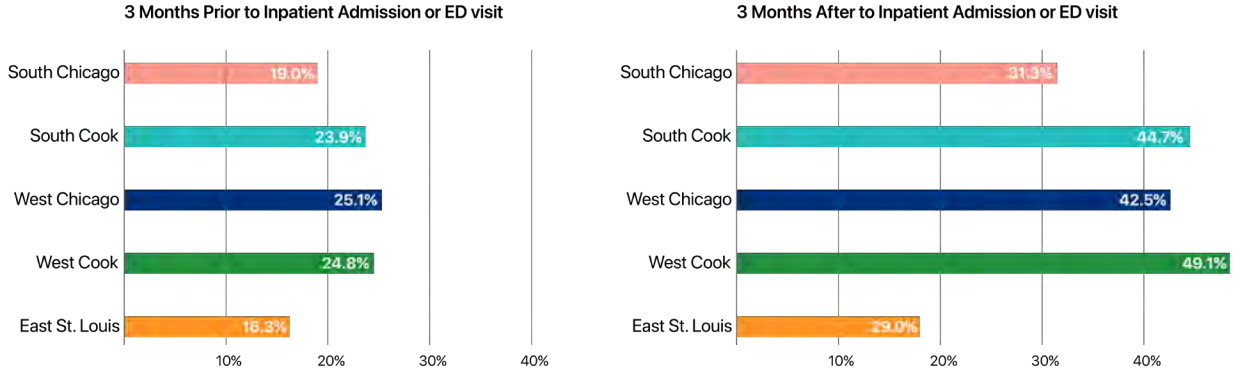
- PQI 90 Composite combines hospital admission rates for both acute and chronic PQIs
- PQI 91 Acute Composite is a composite

Figure 8: Proportion of Prior and Subsequent Outpatient Care among Patients Who Received Hospital-Level Care for Mental Disorders



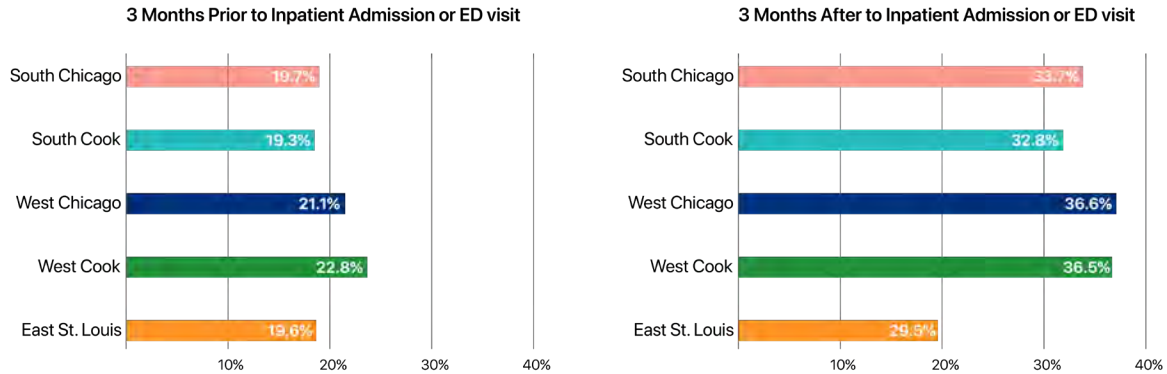
Included in this analysis are ICD-10 principal diagnosis codes from Chapter 5 in the CMS Tabular List of Diseases and Injury, excluding ICD-10s for substance use disorders.

Figure 9: Proportion of Prior and Subsequent Outpatient Care among Patients Who Received Hospital-Level Care for Psychoactive Substance Use Disorders



Included in this analysis are ICD-10 principal diagnosis codes from Chapter 5 in the CMS Tabular List of Diseases and Injury, for the "Mental and behavioral disorders due to psychoactive substance use" disease block.

Figure 10: Proportion of Prior and Subsequent Outpatient Care among Patients Who Received Hospital-Level Care for ACSCs



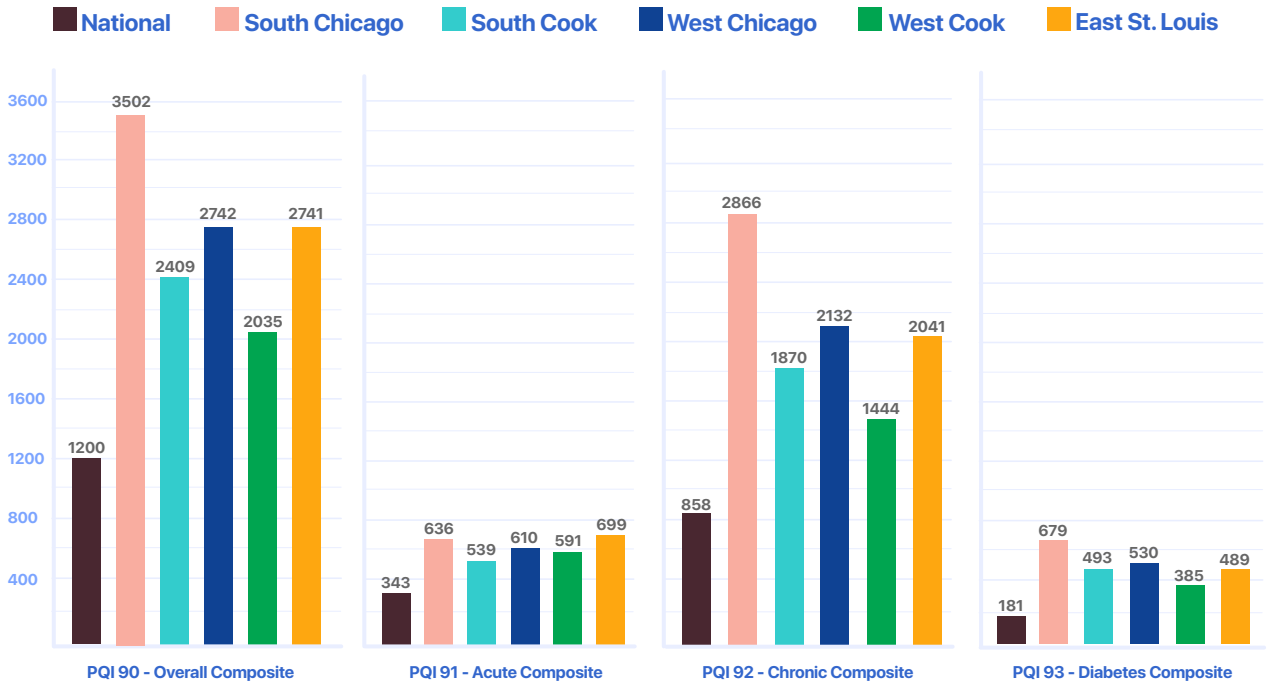
Included in this analysis are ICD-10 principal diagnosis codes categorized as Ambulatory Care Sensitive Conditions by Agency for Healthcare Research and Quality (https://www.qualityindicators.ahrq.gov/modules/pqi_overview.aspx).

indicator of acute, episodic admission rates and consists of the following admission rates:
    - Bacterial Pneumonia (PQI 11)
    - Urinary Tract Infection (PQI 12)
- PQI 92 Chronic Composite is a composite indicator of chronic disease admission rates and consists of the following admission rates:
    - Diabetes, Short-Term and Long-Term Complications (PQI 01 & 03)
    - COPD or Asthma, Older Adults (40+) (PQI 05)
    - Hypertension (PQI 07)
    - Congestive Heart Failure (PQI 08)
    - Dehydration (PQI 10)
    - Uncontrolled Diabetes (PQI 14)
    - Asthma, Younger Adults (18–39) (PQI 15)
    - Lower Extremity Amputation among Patients with Diabetes (PQI 16)
- PQI 93 Diabetes Composite is a composite indicator of diabetes admission rates and consists of the following admission rates:
    - Diabetes, Short-Term and Long-Term Complications (PQI 01 & 03)
    - Uncontrolled Diabetes (PQI 14)

(See Appendix for disease-specific PQIs rates as well as other ACSC measures for the East St. Louis and the other 4 study areas.)

AHRQ publishes national benchmarks for PQIs. Across study areas, including East St. Louis, age-adjusted admission rates for composite PQIs outpace national benchmarks (see Figure 11).

Figure 11: Composite PQIs (PQI 90, 91, 92 and 93) Hospital Admission Rates per 100,000 Medicaid Recipients, Age-Adjusted[1], by Study Area with National Benchmarks for the General Population as Reference



[1]These rates take into account differences in the age distribution of the Medicaid recipient population between study areas and as well as the national benchmark population.

In fact, East St. Louis has the highest age-adjusted rate of hospital admission rates for PQI 91 Acute Composite out of all study areas. The main driver of acute ACSC admission rates appears to be bacterial pnuemonia. East St. Louis exceeds both national benchmarks as well as all other study areas on admission rates for PQI 11 Bacterial Pneumonia (see Figure 12).

Results of multivariate logistic regressions show that middle-age to senior men are most associated with bacterial pneumonia hospitalizations (see Figure 13). Rates are particularly high for senior men age 75 and older suggesting a possible role for more widespread pneumococcal vaccination as a prevention strategy in the East St. Louis area.

Taken as a whole, the outpatient and PQI data paint a clear picture: Medicaid enrollees have poor access to outpatient care and higher levels of prevention-sensitive hospitalizations in East St. Louis as well as the other 4 study areas. This is especially true for bacterial pneumonia in East St. Louis, particularly among middle-age to senior men. Improving accessibility to quality outpatient care will be critical to decreasing hospital admissions for ACSCs. Improving accessibility to outpatient care will help decrease hospital admissions for mental illnesses and substance use disorders as well.

(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 Figures 11 and 12, these rates are compared against *national* PQIs rates which are made up discharge data from the general population. These benchmarks are being used to gauge, directionally, the state of the healthcare ecosystem in each study areas. 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, state-wide and by insurance status. See the "Data Limitations and Opportunities for Future Research" section for more information.)

Figure 12: PQI 11 Bacterial Pneumonia Hospital Admission Rates per 100,000 Medicaid Recipients, Age-Adjusted, by Study Area with National Benchmarks for the General Population as Reference

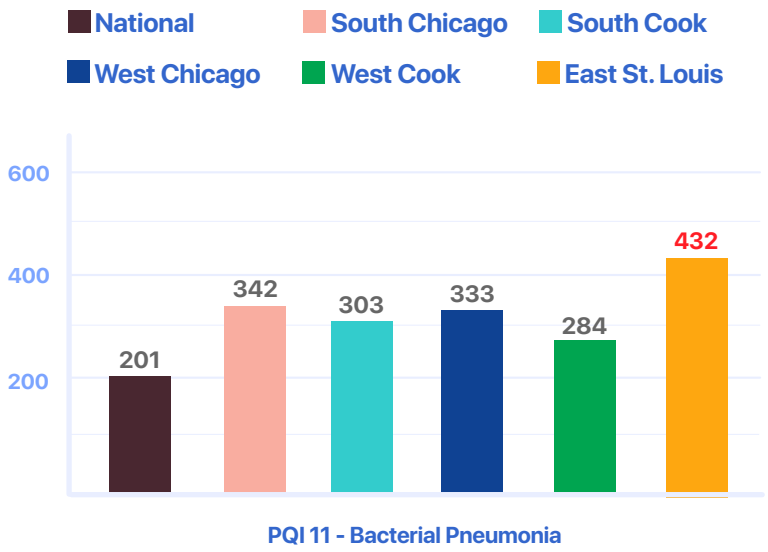
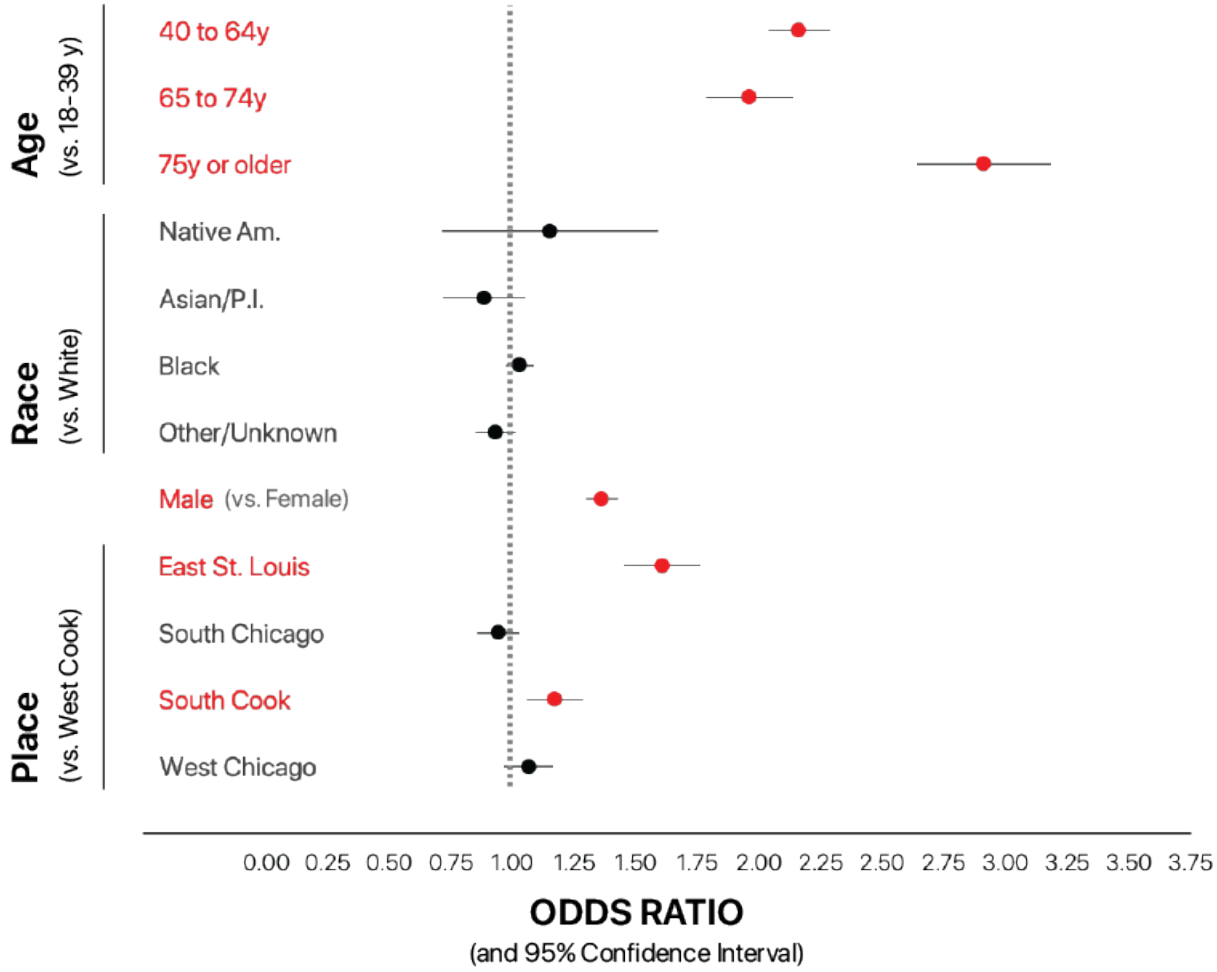


Figure 13: Population Characteristics Associated[1] with PQI 11, Bacterial Pneumonia

(Variables highlighted in red are statistically associated with bacterial pneumonia, meaning the odds ratio and confidence level lower limit are ≥ 1 and the p-value is < 0.05)



[1]An odds ratio and confidence level limit over 1 means the characteristic is more likely than reference group to be associated with hospitalization for the disease and an odds ratio and confidence level limit under 1 means the characteristic is less likely than the reference group.

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

The findings above demonstrate that proportionally few of the patients who received hospital-level care for the most frequent and resource-intensive conditions also received outpatient care either before or after hospitalization or an ED visit. These low levels of outpatient care point to the need for resources in communities to help manage bipolar, depressive, alcohol use, and opioid use disorders as well as the most common ACSCs. Recognizing that healthcare data can reveal what is happening, but not explain why, a parallel qualitative study was conducted to understand social factors that contribute to high rates of utilization.

57 community input sessions were held with 252 residents of the East St. Louis Metro Area, Chicago's South and West sides, and in South Cook County between June and November 2020 (see Figure 14–15). Community residents were recruited from the most distressed zip codes in each study area. In East St. Louis, residents were recruited from these zip codes (see Appendix D for information on how zip codes were selected):

- 62002 (Alton/East Alton, IL)
- 62025 (Edwardsville, IL)
- 62040 (Granite City, IL)
- 62059 (Brooklyn, IL)
- 62060 (Madison, IL)
- 62090 (Venice, IL)
- 62095 (Wood River, IL)
- 62201 (East St. Louis, IL)
- 62203 (Centreville, IL)
- 62204 (Washington Park, IL)
- 62205 (Centreville, IL)
- 62206 (Cahokia, IL)
- 62207 (Centreville, IL)
- 62234 (Collinsville, IL)

During community input sessions, residents engaged in structured conversations to understand challenges that they face across a simple "healthcare journey" consisting of: staying healthy; recognizing a healthcare need and deciding to get care; arranging and getting to care; receiving care; and managing a condition over time (for those with ongoing health issues). Community residents spoke of multiple barriers (or social determinants) that they face at each point in the healthcare journey. *These community-identified barriers vividly demonstrate the "why" behind the low rates of outpatient-care engagement and high rates of hospitalization for key diseases identified in the quantitative data*. Table 6 lists these barriers.

A summary of findings for each type of social determinant barrier follows. Before moving on to these findings, it's important to note the cumulative impact that these barriers have on residents in communities with high social vulnerability. When people decide to seek care, they make an implicit cost-benefit analysis, trading off time, money and trouble against the value they expect to gain from care. The barriers voiced by community residents tip the balance toward the costs of seeking care and away from the value of getting healthcare. In other words, resident stories about healthcare barriers demonstrate that the cost-benefit calculus applied in deciding whether to seek care would produce a substantially different result if these residents resided in areas with lower social vulnerability.

Figure 14: Final Tally of Community Input Participants and Sessions forAll Study Areas

All Study Areas: 252 Participants / 57 Sessions

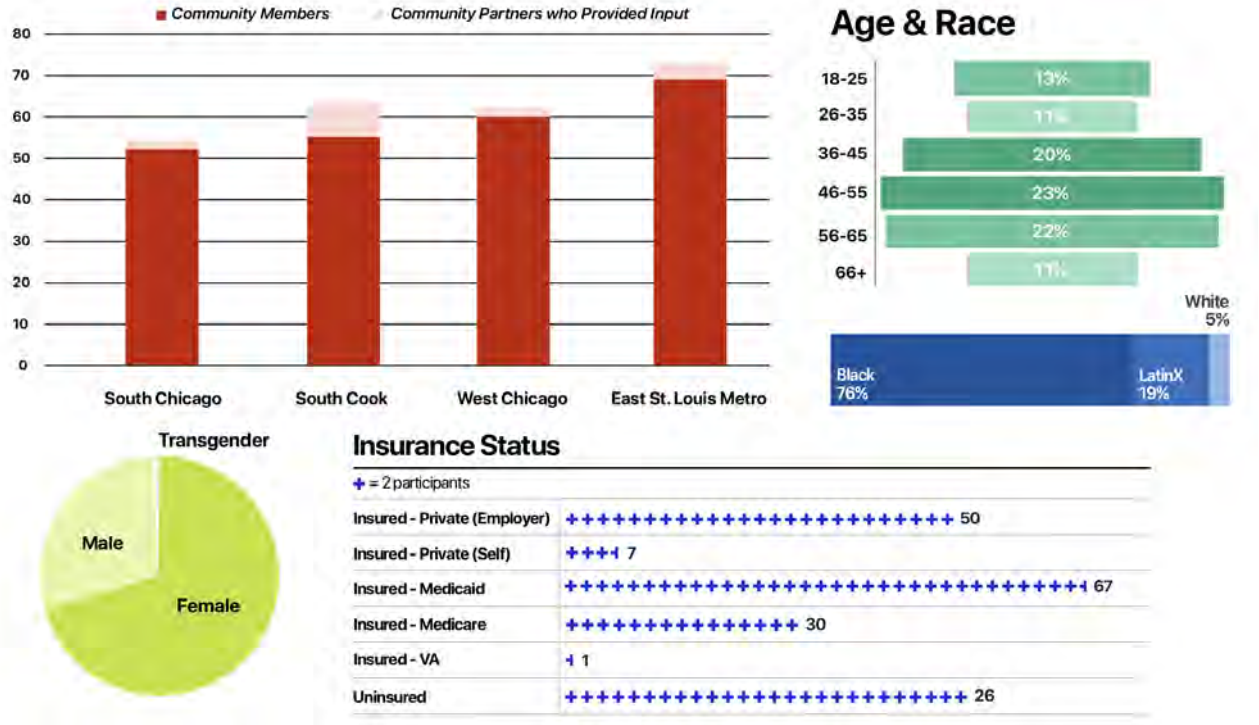


Figure 15: Tally of Community Input Participants and Sessions for the East St. Louis Metro Area

East St. Louis: 69 Participants / 16 Sessions

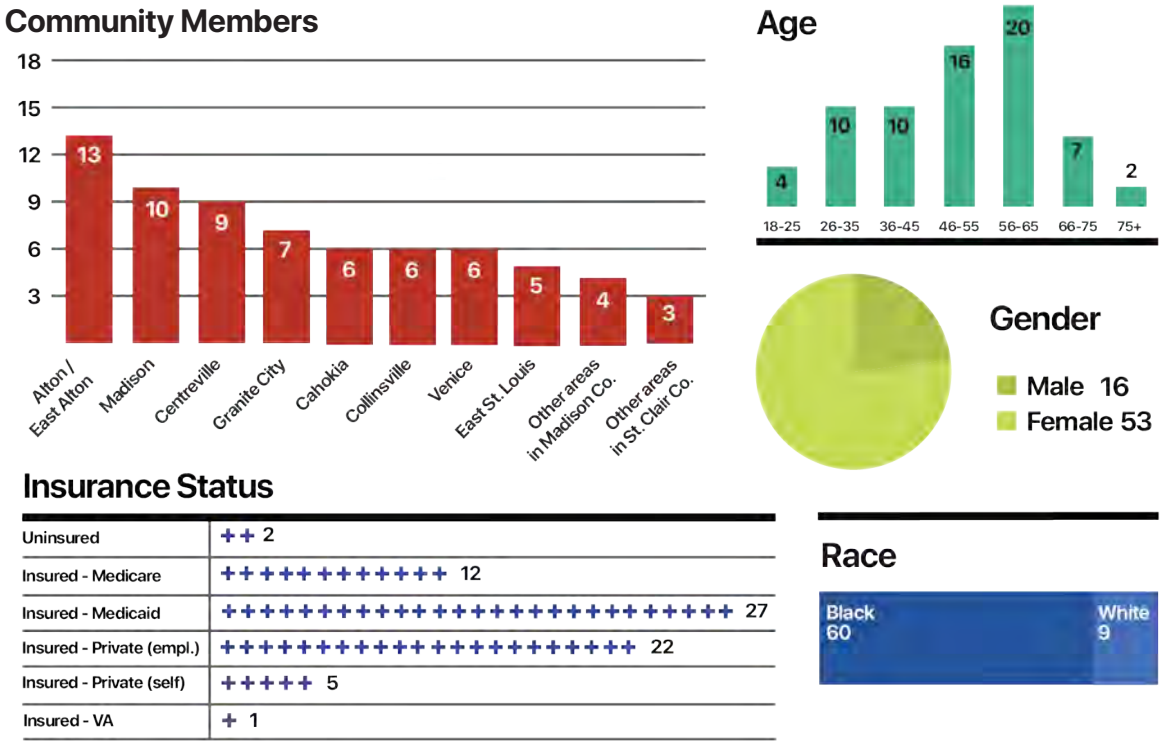


Table 6: Community-Defined Barriers to Staying Healthy and Accessing Care

BARRIERS BY SOCIAL DETERMINANTS OF HEALTH

	Staying healthy	Recognizing a health need and deciding to get care	Arranging and getting to care	Receiving care (point of service)	Managing the condition in daily life
Knowledge & Information (i.e., health literacy barriers – the lack of awareness, information and skills needed to care for one's health and navigate health services)	• Lack of factual and trustworthy health information	• Lack of knowledge of signs and symptoms of prevalent health conditions • Lack of knowledge of what is covered or not covered in insurance plan • Fear about getting healthcare as a result of the lack of knowledge or information (i.e., fear due to unknown costs involved, fear of bad diagnoses, etc.)	• Lack of awareness of healthcare services within community • Lack of awareness of where to seek care that fits one's needs	• Difficulty understanding technical medical terms and physician instructions	• Difficulty applying physician instructions to personal circumstances • Lack of knowledge of local resources to help manage condition
Economic (i.e., inability to access activities, programs, and services due to the associated costs)	• Lack of time for self-care (i.e., exercise, preparing healthy food, preventative care, etc.) • Inability to afford healthy food • Unemployment or economic instability • Housing instability	• Inability to afford health insurance • Inability to afford out-of-pocket care costs (e.g., co-pays) • Inability to afford time off work to seek care	• Lack of insurance or under-insured • Inability to afford transportation	• Inability to afford out-of-pocket care costs (for example, co-pays)	• Inability to afford treatment (e.g., medication, equipment, supplies, etc.)
Healthcare Service (i.e., barriers that impede equitable access to, and engagement with, healthcare services)	• Lack of preventive screening or programming in the community	• Previous negative healthcare experience • Fear of going to healthcare facilities due to COVID-19	• Poor quality of local healthcare facilities (self-reported) • Long wait times for appointments • Scarcity of local healthcare facilities (lack of, or limited options due what health insurance is accepted) • COVID-19 closures or reduced appointments	• Long wait times at the point of care • Service quality disparities • "Transactional" experiences with providers (e.g., short facetime, bias towards medication, etc.) • Lack of trained, culturally competent providers • Discrimination due to race, socio-economic status or insurance status (i.e., having Medicaid for insurance) • Care that doesn't fit cultural context (e.g., language and behavioral norms)	• Lack of consistent healthcare support to help manage condition over time
Socio-Cultural (i.e., individual or collective attitudes and beliefs that impact one's ability to maintain health and engage in healthcare)	• Culturally ingrained food and cooking habits	• Hesitancy to seek care (due to historic healthcare system mistrust, cultural issues, immigration status, fear of doctors, stigma, or previous bad experience) • Concealing health issues from family and friends			• Social isolation (lacking a support system) • Strain on social support system (i.e., emotional, physical, economic)
Environmental (i.e., resource, service, context and infrastructure obstacles in the community that limit one's ability to maintain health and engage in healthcare)	• Lack of resources (i.e., food, recreation, transportation, walking infrastructure, etc.) • Poor air quality due to local polluters • Presence of unhealthy foods • Prevalence of drugs and alcohol in communities • Exposure to ongoing crime, street violence, domestic abuse, neglect and/or discrimination		• Insufficient transportation options		• Lack of resources (i.e., food, recreation, transportation, walking infrastructure, etc.) • Poor air quality due to local polluters • Presence of unhealthy foods • Prevalence of drugs and alcohol in communities • Exposure to ongoing crime, street violence, domestic abuse, neglect and/or discrimination

Note: Community residents spoke of structural inequities such as resource access (including healthcare access), the quality of local resources, generational disinvestment, unethical scientific experimentation, racism, and discrimination based on socioeconomic status as significant contributors to health in their communities. Community residents described these inequities as a cause of chronic stress, cycles of violence, mistrust of the healthcare establishment, health disparities, and the lack of economic and educational opportunities.

Knowledge and Information Barriers

Knowledge and information barriers, also known as health literacy barriers, include the lack of awareness, information, and skills needed to care for one's health and navigate health services. Residents described a range of knowledge and information barriers to achieving and maintaining health. They spoke of:

- lacking knowledge, tools, and time needed to lead a healthy lifestyle
- lacking trusted sources of health information
- not knowing signs and symptoms of medical conditions
- confusion about health insurance coverage for needed services
- not knowing where to find services to meet a health need
- challenges integrating provider recommendations into lifestyle

The lack of trusted and accurate health knowledge and information often results in fear and delay of care. Residents talked about this absence of trust as a reason to avoid care and expressed related fears: the fear of bad diagnoses, fear about the costs of care and treatment, and fear associated with contracting COVID-19 at the offices of healthcare providers.

Community members' suggestions for how to address health information and health service navigation barriers, included pairing preventive health information with community-based programs to teach the skills needed to shift behavior, health fairs, healthy cooking classes, farmers markets, and exercise programs offered through local schools, community centers, and the park district. In addition, residents recommended that messaging about available health resources be culturally tailored to communities and appropriate channels identified to ensure reach and penetration.

On lack of knowledge about healthy eating

"We need to educate people how to eat. If you go to someone and ask them how to eat, it's a really mysterious question for them. I would actually like the answer on how to do it! I've gone on the internet and searched because I'm struggling to lose weight. But there's still a lot that I don't know."

Centreville resident
(East St. Louis Metro Area)
Male, 26–35 years old

On not knowing the signs and symptoms of a health condition

"I know of people that just dropped dead from heart attacks—middle-aged and older—because they did not know about their condition."

Centreville resident
(East St. Louis), Male
56–65 years old

Economic Barriers

Economic barriers are defined as the inability to access activities, programs, and services—both prevention and intervention—due to the associated costs. Residents spoke of economic barriers impacting residents' ability to stay healthy and afford needed care and treatment. Residents from all study areas identified key economic barriers to health, including:

- unemployment and underemployment
- lack of insurance or inadequate insurance
- cost of medication
- cost of healthy food
- cost of transportation
- cost of fitness membership and other wellness programs
- cost of co-pays

Of particular concern to East St. Louis Metro Area residents was the cost of healthy food, transportation costs to healthcare services and full-service grocery stores, the cost of co-pays, health insurance, and medication. Another "affordability" barrier to healthcare was not being able to afford to take the time off of work to get care.

On inability to afford out-of-pocket care costs

"Paying for healthcare? Minimum wage is the issue. If you don't have the money for [health] insurance, how are you going to get care? I make $400 per week, which is pretty decent. My rent is $475, car insurance is $200, my car note is $187, and on top of that I have electric, phone, sewer, and water bills, and college tuition. So already, that's over what I make."

Cahokia resident
(East St. Louis Metro Area)
Male, 26–35 years old

"Although I have private insurance, it does not cover a lot. My medications are very expensive. A lot of times, my family has to help me get my medicine each month, even though I work. I have a decent job and make decent money. Still, it costs me a lot for medication each month."

Madison resident
(East St. Louis Metro Area)
Female, 56–65 years old

On cost of healthy food

"We can't afford to eat the way we are supposed to eat. I make $1,300 a month and once you pay all the bills, there's not that much left. Then, you have to pay for transportation to get you to the [grocery] store. It's super difficult to eat a proper diet . . . especially if you have a family [to feed]".

Cahokia resident
East St. Louis Metro Area),
emale, 46–55 years old

"When I was first diagnosed with diabetes, I took a nutrition class. Then, when I got to the store, I was trying to buy [the food that was recommended] and found out that the sugar-free stuff was higher [in price] than the regular stuff. It was way higher. So I couldn't afford it."

Alton resident
(East St. Louis Metro Area)
Female, 46–55 years old

Healthcare Service Barriers

Healthcare service barriers impede equitable access to, and engagement with, healthcare services. Access barriers include lack of preventive services for staying healthy; lack of local outpatient facilities for arranging, accessing, and getting care; and lack of healthcare service support to manage a condition over time. Residents also spoke of experiencing "transactional" care—care not attuned to cultural context or not meeting their individual, personal needs.

Access barriers: Residents of all study areas spoke of a scarcity of community-based healthcare facilities and services, due to an actual lack of local facilities or lack of local facilities that take residents' type of health insurance. Several residents described shifting from employer-provided insurance to public insurance due to job layoffs, some associated with the COVID-19 pandemic, and as a result, not able to see a provider who they had seen in the past. Such changes forced some to seek care outside of the community and others to delay care.

On scarcity of local healthcare facilities

"If we had more clinics in low-income communities, you wouldn't have to call a ride to pick you up 2 hours before your appointment, and then sit there waiting for 2 hours to see a doctor. I think this should be addressed because we have a lot of health issues. . . . If we had clinics in our neighborhoods, then I think we'd become a healthier America."

Cahokia resident
(East St. Louis Metro Area)
Male, 56–65 years old

On scarcity of local drug treatment options due to insurance

"With certain insurance, facilities do not take you . . . so you have to call all over Illinois or go up to Chicago and that's crazy. When somebody is ready to get help, then it's a stand still—you have to wait 30 days and you have to keep calling back until you get them in. That's a downfall right there—people are going to go back to using when they don't get that help right away."

Alton resident
(East St. Louis Metro Area)
Female, 56–65 years old

Photo by Brown Planet Productions for the UIC Transformation Project

Photo by Brown Planet Productions for the UIC Transformation Project

"Transactional" care experiences: Community residents—in particular, those with chronic conditions, including mental illness and substance use disorders—expressed a disconnect between the care they expected to receive and the actual care delivered by a provider. Community residents expected to have time with providers to ask questions, talk about options for care, and get help that fit within their circumstances (for example, medications covered by insurance and treatment suggestions that fit their financial and homelife realities). Instead, many residents experienced very different encounters with the healthcare system. Dissatisfaction with provider interactions included: little time spent with providers to ask questions and understand the information being conveyed, being provided with a prescription but not addressing options or available resources to help manage a condition, and feeling like being treated as a number and not a person. In other words, many community residents expected relationship-based care with healthcare providers but instead experienced care that was impersonal and transactional. A number of residents noted that repeated negative encounters with the healthcare system influenced their decisions to not engage with it at all.

On bias toward medication

"Not being heard by my doctor was a problem for me. He was quick to give out medication and stuff but not try anything else before medication—like a change in diet or routine. . . . I found another doctor because you want to go to someone who treats you with respect, someone who treats you like a human being and not a science experiment."

Centreville resident
(East St. Louis Metro Area)
Female, 18–25 years old

On lack of trust and dialog with doctors

"There is a lack of trust with doctors [because] . . . a lot of times, they don't want to take time with you. . . . When you get a good doctor, one that really cares, they will take the time to sit there, talk to you and explain everything to you. That's when everything comes together as one."

East Alton resident
(East St. Louis Metro Area)
Female, 56–65 years old

Table 7 outlines the dimensions of a relationship-based care experience from the perspective of community residents in contrast to the transactional encounters they experience.

Table 7: The Desired Shift from Transactional Care to Relationship-Based Care from a Resident Lens

	Transactional care (status quo)	Relationship-based care (desired)
Logistics / administrative	I often need to wait months before I am able to get in for an appointment.	I expect to be able to schedule an appointment when I have a health care need.
Waiting room experience	Due to providers running behind schedule, I often need to wait to be seen.	I expect my time to be valued and for the office to run on time.
Patient-provider relationship	When my appointment lasts 15 minutes, and then I am pushed out the door, I feel like a number.	I expect my doctor to seek to understand and invest in my whole [bio-psycho-social] person.
Decision making	My doctor tells me what to do based on what he/she thinks is best for me.	I expect to take an active role in making decisions about my body and health.
Care plan	When the doctor rushes to a prescription, it feels like a band-aid solution. My insurance doesn't cover the prescription given. The doctor recommends that I cook healthy meals each night. I am managing multiple jobs and young children. I need fast, convenient options. The doctor recommends I go outside for walks but it isn't safe in my neighborhood and a fitness membership is expensive.	I expect my doctor to seek to understand the root cause of my symptoms. I expect care recommendations that fit my insurance and life circumstances.

Sociocultural Barriers

Sociocultural barriers are individual or collective attitudes and beliefs that impact a person's ability to stay healthy and engage in healthcare. Sociocultural barriers impact staying healthy, recognizing a health need and deciding to get care, and managing a health condition in daily life. Key sociocultural barriers include ingrained eating and cooking habits, hesitancy to seek care due to sociocultural beliefs, and issues related to social support systems.

Ingrained eating and cooking habits: Ingrained, unhealthy eating and cooking habits impede residents' ability to stay healthy and to care for chronic diet-related diseases, but residents find these habits hard to change because food is a critical piece of social connectivity and comfort.

On ingrained eating habits

"The things we eat contribute to high blood pressure. We always want to add salt to the food we make . . . and we make a lot of fatty foods. Rather than frying, we should bake but we just don't do that. We eat what we like and then deal with the consequences later."

Alton resident
(East St. Louis Metro Area),
Female, 46–55 years old

"Before [I got sick], I was a mover. I played sports and I was in all types of activities [so I ate what I wanted]. I wasn't eating vegetables, I was a meat man. I'd grab a few burgers or a box of chicken. Just meat and bread."

Washington Park resident
(East St. Louis Metro Area),
Male, 26–35 years old

Photo by Brown Planet Productions for the UIC Transformation Project

Hesitancy to seek care: Hesitancy to seek healthcare was a top issue in the East St. Louis Metro Area and that hesitancy took many forms. Black residents in East St. Louis harbor a mistrust of the medical system. That mistrust stems both from historic, unethical practices, such as the U.S. Public Health Service Syphilis Study at Tuskegee, as well as discriminatory treatment in healthcare today. Participants also expressed learning from their family of origin that "you don't go to the doctor" or "you treat issues at home." Another group with longstanding hesitancy to seek out medical care is men. This hesitancy seems to stem from an unwillingness to appear weak or vulnerable as well as lack of time due to working, especially in early adult life, when a habit of not seeing a doctor forms. Fear of "bad news" keeps people from seeing a doctor too, and for mental illness and substance abuse, social stigma is a barrier.

On mistrust of the healthcare system

"A lot of minorities have a certain disdain when it come to the healthcare system because of the history of injustice, with certain medical experiments being tried on African Americans. So, we have reasons as to why we don't trust doctors . . . because of the Tuskegee study and all that."

Alton resident
(East St. Louis Metro Area)
Female, 18–25 years old

On men not seeking care

"In my family, men just don't want to go to the doctor. My stepdad hadcancer on his arm and he just let it go and go and go until it was just terrible."

Collinsville resident
(East St. Louis Metro Area)
Female, 56–65 years old

Photo by Antreina Stone on Unsplash

Photo by Brown Planet Productions for the UIC Transformation Project

Issues related to social support systems: Residents spoke of the emotional, physical, and economic strain that chronic illnesses put can put on individuals as well as on their family and friends. Caregiving becomes an additional job that can be part driver, counselor, advocate, care coordinator, cook, translator, and nurse. These additional responsibilities can become a source of stress that in turn can affect the caregiver's health. Chronically ill residents without strong support systems spoke of social isolation as well as delayed care due to lack of logistic and emotional support. COVID-19 has exacerbated both the strain on support systems and social isolation.

On the stress of caretaking

"I took care of my mother for years. She just recently passed. As a caretaker, it effects you emotionally and physically because, in the end, my mother was bedridden. She had to be changed. She had to be fed. And I still worked a full-time job. It takes a lot out of you. Sometimes I didn't know if I could do it."

East Alton resident
(East St. Louis Metro Area)
Female, 56–65 years old

Environmental Barriers

Environmental barriers are resource, service, context, and infrastructure obstacles in the community that limit one's ability to maintain health. Environmental barriers mentioned by residents across all community input sessions include: living in a resource desert (food, recreation, green space, transportation, healthcare facilities, etc.), the presence of unhealthy food options in communities, prevalence of drugs and alcohol in the community, poor air quality and exposure to ongoing crime, street violence, domestic abuse, neglect, and discrimination.

For community residents, key resources lacking in distressed parts of the East St. Louis Metro Area include a lack of local full-service grocery stores, a lack of transportation, and lack of healthcare resources in the community. Finally, residents reported a lack of recreational options in the area, such as gyms and sidewalks.

On lack of grocery stores in the community

"I live in Washington Park and it's a food desert. You have corner stores and basically, that's all. . . . You have to go out of the community to get [to grocery stores to get] quality fruits and vegetables."

Washington Park resident
(East St. Louis Metro Area)
Female, 56–65 years old

On lack of access to transportation

"If you don't have your own transportation and you're trying to get on the bus [with groceries], there is only so much you can carry. Or, if you have someone take you, you have to pay them and sometimes, they don't want to wait for you so you feel rushed and you don't have time to get what you need."

Centreville resident
(East St. Louis Metro Area)
Female, 46–55 years old

On lack of sidewalk infrastructure

"I live on a front street and I'd like to be able to walk. But we need sidewalks to do that and we need to get rid of all the stray dogs around here. . . . Right now, we have to walk in the dirt or on the road and take the chance of getting hit by a car."

Centreville resident
(East St. Louis Metro Area)
Female, 46–55 years old

COVID-19 Exacerbated Barriers to Health and Healthcare

The COVID-19 pandemic has heightened barriers to staying healthy and accessing care and contributed to increased violence, addiction, mental health issues, and difficulty managing chronic conditions.

Community residents saw impacts of COVID-19 in:

- unemployment and the sudden loss of insurance
- isolation exacerbating mental health issues
- suspension of in-person 12-step programs
- postponement of needed care for fear of going into healthcare facilities
- friction with telehealth, due to lack of equipment, internet access, or technical knowledge or dissatisfaction with past telehealth appointments
- Stress and depression as a result of losing friends and family members to the virus

In addition, several residents described the closure of local pharmacies in the aftermath of George Floyd's death and the subsequent social unrest which prevented them from obtaining medications to manage chronic conditions.

(See Appendix D for additional information about the community input gathered in East St. Louis including information on the community organizations that conducted the input sessions, the approach to recruiting community residents, the discussion guide and the format of the community input sessions.)

Photo by Pedro Ceu on Unsplash

Photo by National Cancer Institute on Unsplash

5: Reviewed healthcare resources in the 5 study areas and found gaps that could contribute to greater incidence of hospitalization for key disease groups and conditions.

An examination of existing resource data and an analysis of healthcare facility accessibility compared with disease rates revealed resource gaps that may contribute to lower rates of engagement with outpatient care and higher rates of hospitalization for mental illnesses, substance use disorders, and ACSCs. Specifically, the resource analysis found that parts of the East St. Louis area and the other 4 study areas have primary care shortages and mental health professional shortages. In addition, an analysis of behavioral health facilities accessibility revealed specific zip codes in East St. Louis that have a confluence of high disease rates combined with low facility access.

Resource Gaps: Mental Illness and Substance Use Disorders

The Health Resource and Services Administration (HRSA) provides indices of healthcare resources availability for both primary care and for mental health professionals. HRSA data were reviewed and translated into maps that indicate areas within the 5 study areas where mental health professional shortages exist. HRSA defines mental healthcare shortage areas as either a shortage of providers for the entire population within a defined geographic area or a shortage of providers for a specific population group(s) within a defined geographic area (for example, low income, migrant farmworkers, and other groups). The area in and around the city of East St. Louis is designated as a mental health professional shortage area (see Figure 16).

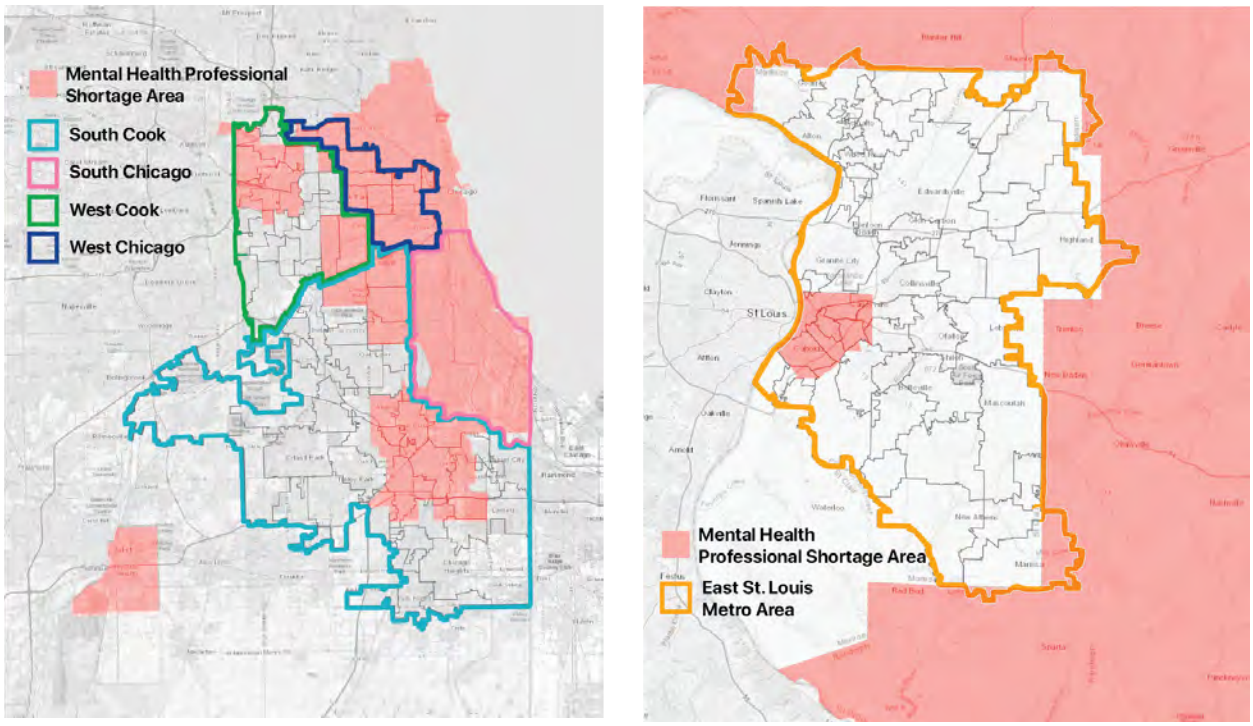
In addition to looking at HRSA, rates of behavioral health facilities access were calculated and compared to rates of hospital-level care (that is, inpatient hospitalizations and ED visits) for mood [affective] disorders and substance use disorders. Rates of behavioral health facilities per 100,000 in zip codes were calculated by combining a geo-spatial analysis of facility data from the Substance Abuse and Mental Health Services Administration (SAMHSA) with census population data. The geo-spatial analysis takes into consideration 30-minute travel times to measure the spatial barrier between populations and facilities.

Facilities in this data include:

- public and private psychiatric hospitals
- non-federal general hospitals with separate psychiatric units
- U.S. Department of Veterans Affairs medical centers
- residential treatment centers
- community mental health centers
- outpatient, day treatment, or partial hospitalization mental health facilities
- multi-setting (non-hospital) mental health facilities

Outpatient facilities make up the majority of all facilities in the data set. Maps of facilities access per 100,000 appear in Figures 17–18, with the darkest areas on the map indicating zip codes with the least amount of behavioral health facilities access per capita. Zip codes are highlighted and overlaid onto the facilities access data. Blue highlighted zip codes experience the highest rates of hospital-level

Figure 16: HSRA Mental Health Professional Shortage Areas in Study Areas



care for mood [affective] and substance use disorders. *Yellow highlighted zip codes are those with high rates of hospital-level care for mental illnesses and substance use disorders plus the lowest rates of behavioral health facilities access per capita.*

Within the East St. Louis Metro Area, there is one zip code that has both low facilities accessibility rates and high rates of hospital-level care mood [affective] disorders: 62046 (Hamel, IL). There are 3 zip codes that have both low facilities accessibility rates and high rates of hospital level care for substance use disorders: 62257 (Marissa / St. Libory, IL), 62251 (St. Jacob, IL) and 62087 (South Roxana, IL). See Figures 17b and 18b.

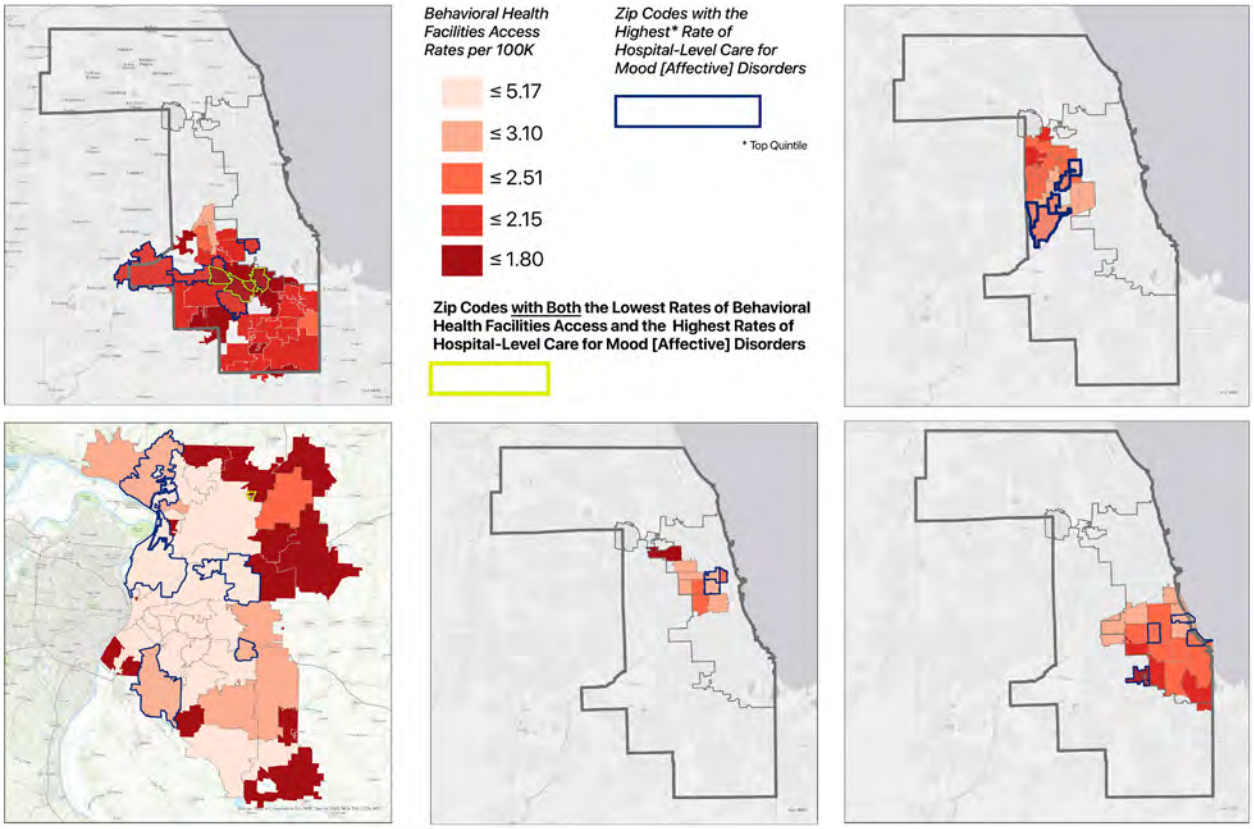
Resource Gaps: Ambulatory Care Sensitive Conditions

Access to primary care is a key component of preventing and managing a variety of ambulatory care sensitive conditions. A review of HRSA's primary care shortage data shows that portions of East St. Louis and the other 4 study areas have primary care shortages (see Figure 19). HRSA defines primary care shortage areas as having either a shortage of providers for the entire population within a defined geographic area or a shortage of providers for a specific population group(s) within a defined geographic area (for example, low income, migrant farmworkers, and other groups).

In addition to primary care shortages, food access was analyzed, given that diabetes, hypertension and heart disease are diet-related ACSCs, and because food access did not factor into community selection for this study (for example, food is not considered in the calculation of social vulnerability scores). Portions of the East St. Louis Metro Area are food deserts as defined and identified by the USDA (see Figure 20).

The USDA defines a rural area food desert as

Figure 17a: Rates of Behavioral Health Facilities Access per 100,000, Rates of Hospital-Level Care for Mood [Affective] Disorders[1], and Overlap Between the Two



[1]Mood [affective] disorders are primarily bipolar and depressive disorders.

Figure 17b: Rates of Behavioral Health Facilities Access per 100,000 and Rates of Hospital-Level Care for Mood [Affective] Disorders for the East St. Louis Metro Area

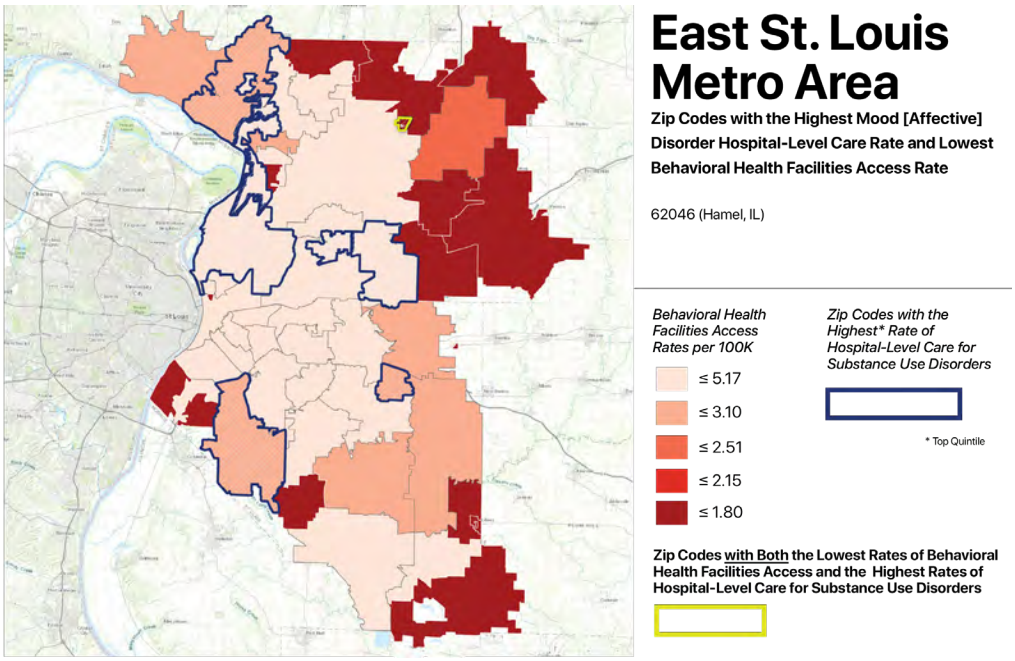


Figure 18a: Rates of Behavioral Health Facilities Access per 100,000, Rates of Hospital-Level Care for Substance Use Disorders for Study Areas and Overlap Between the Two

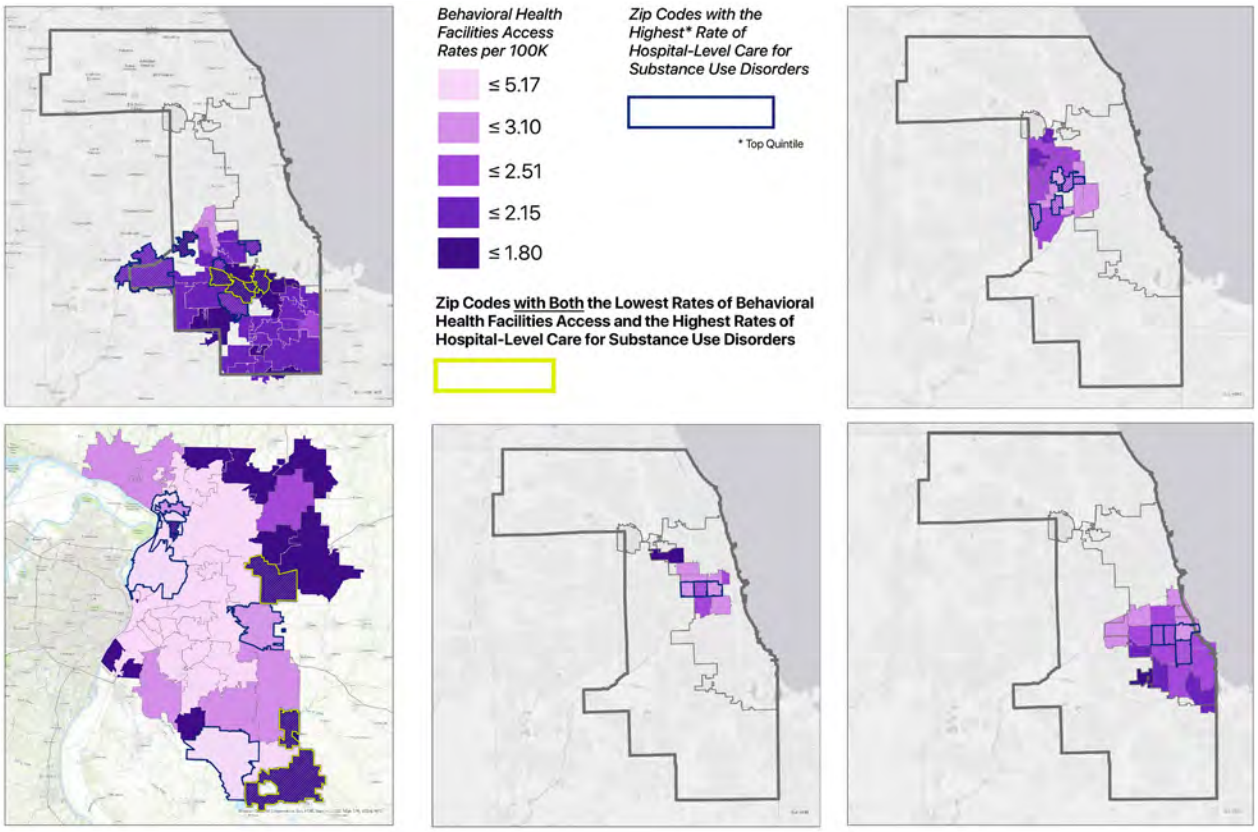
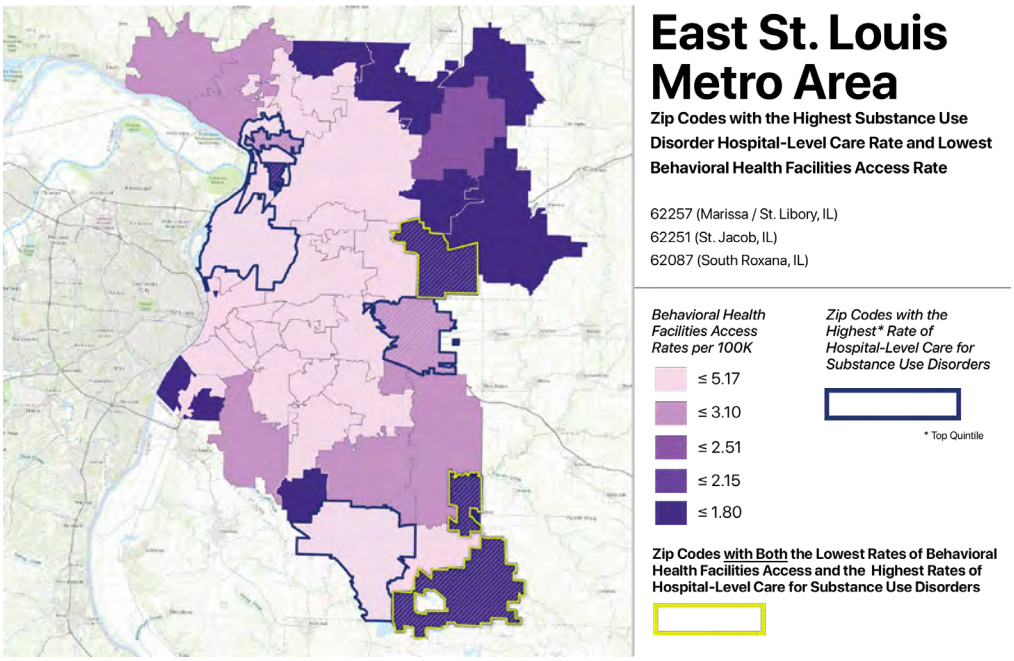


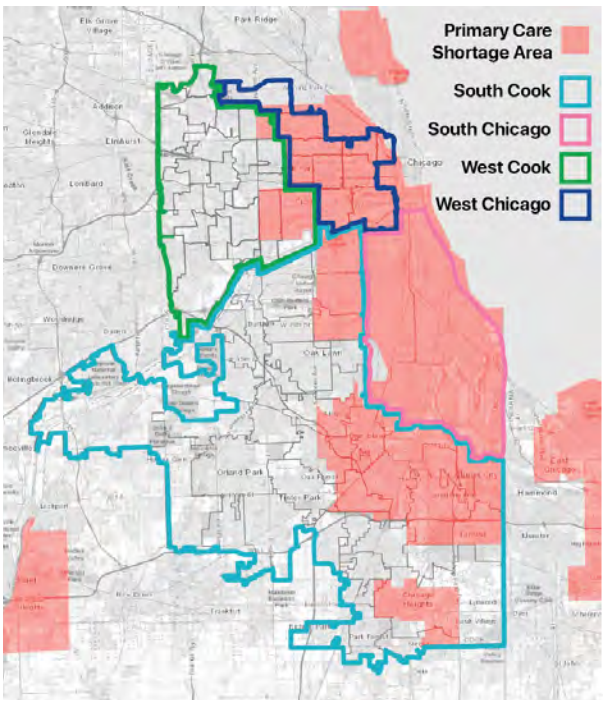
Figure 18b: Rates of Behavioral Health Facilities Access per 100,000 and Rates of Hospital-Level Care for Substance Use Disorders for the East St. Louis Metro Area



census tracts in which a significant number (at least 500 people) or a significant share (at least 33% of the population) lives greater than 10 miles from the nearest supermarket, supercenter, or large grocery store.

Lack of access to a full-service grocery store in communities in the East St. Louis Metro Area may be a contributing factor to ACSCs in the area.

Figure 19: HSRA Primary Care Shortage Areas in Study Areas



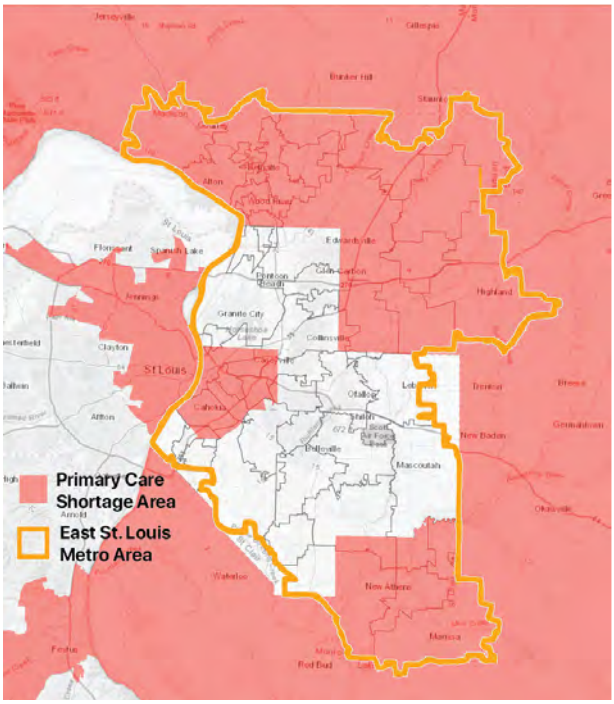
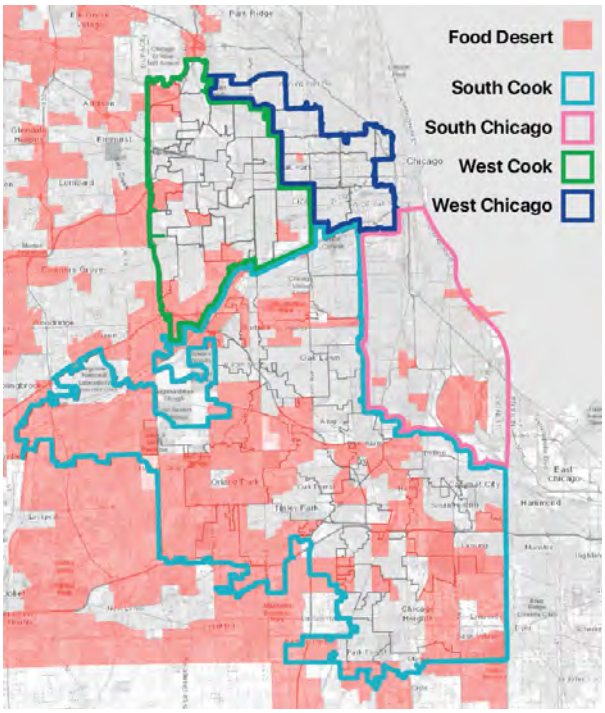
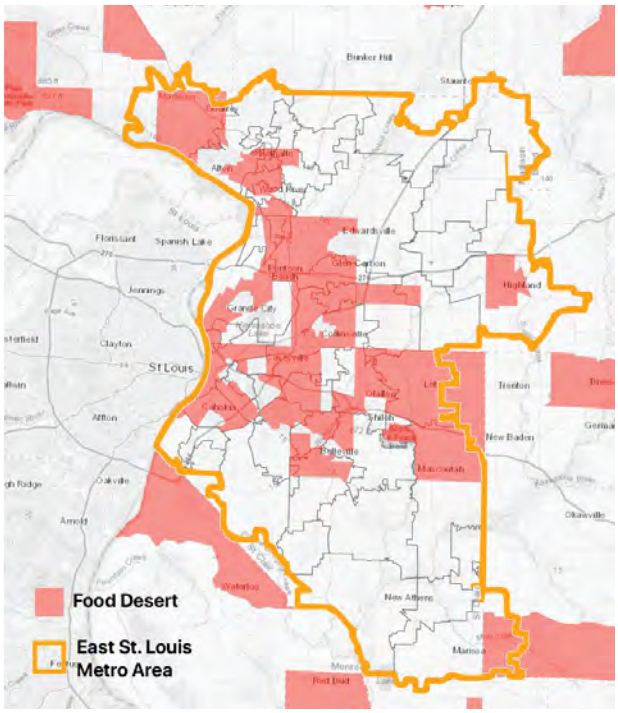


Figure 20: USDA Food Deserts in Study Areas





6: 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 this care and treatment adherence.

What emerges from the combination of the analysis of hospital utilization data, the inventory of concerns expressed by residents in community conversations, and the surveys of available resources is strong indication of a need to improve accessibility to quality primary and specialty care and, in parallel, to address the social determinant of health barriers that make it difficult to prevent disease, access care and adhere to treatment. Doing so will require healthcare systems in the East St. Louis Metro Area to reach out beyond the walls of their hospitals and into communities. It will also require community residents in East St. Louis to become more engaged in their health and healthcare. In other words, the effort will entail finding a middle ground where healthcare systems and communities work together to prevent disease and promote outpatient care 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, to restore trust in the healthcare system in socially vulnerable communities and increase engagement in healthcare.

Recommended objectives to guide future efforts and interventions toward achieving transformation are:

1. **Incentivize clinic-community linkages** in order to address health, healthcare access, and the social determinants of health.
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.**
5. Continuously groom clinic-community linkage services to **reduce and eliminate barriers to care.**

There are 2 important issues to note regarding these objectives. First, in regards to care engagement, there are 2 main opportunities to engage people in care: at ED and hospital discharge moments and engaging people in the community who have chronic illnesses, mental illnesses, or substance use disorder (or risk factors for these) well before an emergency. ED and hospital discharge moments represent a key opportunity, given that people have engaged in some form of healthcare. Engaging people out in the community who have not been regularly engaged in care is a second, and in many ways, more complex task. Outreach efforts to do so need to be accompanied by ongoing

efforts to make outpatient care accessible, available, and affordable.

Second, it's important to note that some communities are structurally disadvantaged from benefitting from the transformation model proposed here. Decades-long disinvestment, particularly in predominantly Black communities, has resulted in a lack of basic healthcare infrastructure including facilities that accept Medicaid. This situation means that any transformation activities will need to also include substantive investments to put healthcare structures in place before interventions can be piloted.

(Note: Table 8 is a list of evidence-based examples of interventions that exemplify one or more of the recommended objectives.)

Table 8: Examples of Evidence-Based Interventions that Support Recommended Objectives

Community Health Worker Support on Clinical Outcomes of Low-Income Patients with Chronic Diseases

Intervention site: Philadelphia, PA
Target population: Patients who resided in a high-poverty zip code, uninsured or publicly insured, diagnosed with 2+ chronic diseases
Dates: January 2015 to March 2016

Challenge	Intervention	Outcomes	Addresses	Intervention an example of:
Half of the U.S. population lives with a chronic disease. The burdens of chronic disease are even greater among people with lower income who often have multiple chronic conditions and face social challenges associated with worse outcomes.	Use of community health workers (CHWs), laypeople from the community hired and trained by healthcare organizations, to support patients using the Individualized Management for Patient-Centered Targets (IMPaCT), a standardized intervention in which CHWs provide social support, navigation, and advocacy to help low-income patients achieve health goals.	• Reduced hospitalizations • Improved quality of care scores	☑ ACSCs ☐ Mental Illness ☐ SUD ☐ Condition Agnostic	☑ Clinic-Community Linkage (CCL) ☑ Integrated, coordinated or collaborative care ☐ Capacity building for CCL, coordinated care or other care ☐ Engagement in care (ED/ hospital discharge) ☐ Engagement in care (outside HC[1] system) ☐ Barrier reduction/ elimination

[1] HC stands for healthcare

Kangovi, Shreya, et al. "Effect of community health worker support on clinical outcomes of low-income patients across primary care facilities: a randomized clinical trial." JAMA internal medicine 178.12 (2018): 1635-1643.

Task-Shifting for Interpersonal Counseling for Depression in Low-Income Areas

Intervention site: São Paulo, Brazil
Target population: *Low-income patients with a current major depressive disorder or dysthymia*
Dates: May 2013 to April 2015

Challenge	Intervention	Outcomes	Addresses	Intervention an example of:
The WHO ranks major depressive disorder (MDD) as one of the most significant challenges of the 21st century because of its consequent disability and loss of function. MDD can be treated early and effectively in primary care but it is often underdiagnosed and under-treated. This mental health treatment gap is more pronounced in low and middle-income areas.	Non-specialist community health workers were trained to provide Interpersonal Counseling (IPC) to treat depressive symptoms in patients receiving treatment at a family health center in São Paulo, Brazil.	Patients receiving the IPC from community health workers showed significant improvement in symptoms. Training non-specialist community health workers in low- and middle-income areas to provide IPC can be a successful strategy for reducing the burden of depression and potentially a low-cost and effective alternative to specialist-led services which might not be available in low- income communities.	☐ ACSCs ☑ Mental Illness ☐ SUD ☐ Condition Agnostic	☐ Clinic-Community Linkage (CCL) ☐ Integrated, coordinated or collaborative care ☑ Capacity building for CCL, coordinated care or other care ☐ Engagement in care (ED/ hospital discharge) ☐ Engagement in care (outside HC system) ☐ Barrier reduction/ elimination

Araya, Ricardo, et al., "Treating depression in primary care in low-income women in Santiago, Chile: a randomised controlled trial." The Lancet 361.9362 (2003): 995–1000.

CA Bridge Model: Developing Hospitals and Emergency Rooms into Primary Care Access Points for Addiction Treatment

Intervention site: 53 hospitals in California
Target population: Patients who present to the ED with Substance Use Disorder
Dates: N/A - currently implemented and operating

Challenge	Intervention	Outcomes	Addresses	Intervention an example of:
Despite evidence that buprenorphine is associated with decreased illicit opioid usage, improved adherence to addiction treatment programs, and cost-savings, 60–80% of people who use opioids do not have access to these medications. Since EDs and hospitals provide 24/7 access to healthcare, they offer a unique opportunity to make treatment for SUD universally accessible. At present, many hospitals do not offer this service.	The CA Bridge model is based on 3 pillars: 1. Provide quick start, low-barrier access to evidence-based medication for addiction treatment for substance use disorder in all hospital departments. 2. Establish pathways to link patients to outpatient care through active support and follow-up. 3. Create a welcoming, non-stigmatizing hospital culture for people who use drugs.	Reduction in the number of emergency department visits from high utilizers who present to the ED with SUD Reduction of SUD-related hospital care Reduction in number and length of psychiatric holds in the ED for patients with co-occurring mental illness and SUD Decreased illicit opioid usage and improved adherence to addiction treatment programs Cost savings (in one study, healthcare savings were $2,074 per patient per year for an intervention group of Medicaid enrollees)	☐ ACSCs ☐ Mental Illness ☑ SUD ☐ Condition Agnostic	☐ Clinic-Community Linkage (CCL) ☐ Integrated, coordinated or collaborative care ☐ Capacity building for CCL, coordinated care or other care ☑ Engagement in care (ED/ hospital discharge) ☐ Engagement in care (outside HC system) ☐ Barrier reduction/ elimination

https://www.bridgetotreatment.org/cabridgeprogram

See also: Busch, Susan H., et al. "Cost effectiveness of emergency department initiated treatment for opioid dependence." Addiction 112.11 (2017): 2002–2010.

Healthcare System-Community Collaboration to Address Housing (Treating the Neighborhood as "Patient" to Address the Social Determinants of Health)

Intervention site: Columbus, OH
Target population: Neighborhood in which hospital is located; neighborhood suffers from concentrated poverty, housing instability, racial segregation, environmental toxins, violence, property crimes, and poorly performing schools
Dates: N/A, currently implemented and operating

Challenge	Intervention	Outcomes	Addresses	Intervention an example of:
Southern Orchards, the neighborhood in which National Children's Hospital is located in Columbus, OH, suffers from "community trauma": inequitable economic and social structures, social institutions, relations of power, privilege, and inequality that prevent them from meeting their basic needs, including housing stability.	The hospital partnered with non-profit community development organization started by a local church to work on housing instability in the neighborhood. Interventions include home repair programs, home ownership programs, home construction, career development, and rental agency development. The hospital acted as the financier of housing interventions. Community-based organizations provided the grassroots community connections to neighborhood residents. In addition, the Mayor's Office of Economic Development facilitated financial mechanisms to support these efforts.	• Lower vacancy rates • Increased the speed and size of neighborhood development	☐ ACSCs ☐ Mental Illness ☐ SUD ☑ Condition Agnostic	☑ Clinic-Community Linkage (CCL) ☐ Integrated, coordinated or collaborative care ☐ Capacity building for CCL, coordinated care or other care ☐ Engagement in care (ED/ hospital discharge) ☐ Engagement in care (outside HC system) ☑ Barrier reduction/ elimination

Araya, Ricardo, et al., "Treating depression in primary care in low-income women in Santiago, Chile: a randomised controlled trial." The Lancet 361.9362 (2003): 995–1000.

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 a set of key ambulatory care sensitive conditions (hypertension, diabetes, asthma/COPD and heart disease). However, in executing this research, there were some limitations in terms of data and community input and these limitations are described below.

Data Limitations

Data Truncated within a 1-Year Time Range

The research team had access to FY2018 Medicaid utilization data under the data use agreement. The one-year time range in the data presents a number of limitations. First, length-of-stay in-patient hospitalizations may be truncated at the year-end (termed right censoring in statistical literature) or may also be left truncated at the start of the year. Second, repeat admissions and visits may also be truncated. For example, in the case of multiple hospitalizations, a patient who has a first hospitalization in the data towards the end of the year will likely have fewer recorded hospitalizations than a patient whose visits started earlier in the year. Third, access to only FY2018 data limited the ability to assess time trends or evolution of utilization over years. Finally, it bears stating that hospitalizations since January 2020 have changed dramatically due to the SARS CoV2 pandemic and, with the long-term effectives of COVID-19 still emerging, it is likely that Medicaid utilization will look different in the coming years. Access to multiple years of data, including 2020 data, would allow for analyses of trends and evolution of utilization over time, as well as the measurement of the impact of COVID-19 on utilization.

Limited Variables Available in Noninstitutional Data

The data obtained under the data use agreement includes:

- institutional data that consists of inpatient admissions, outpatient visits, and emergency department visits in hospital/medical center systems; and
- noninstitutional data that consists of outpatient visits to independent healthcare providers.

The lack of specificity in the noninstitutional data impaired what could be achieved in analysis. For example, providers are classified broadly as "Physicians," or "Nurse Practitioners" with no further specialty-based classifications available in the data. Also, provider addresses are typically only available as billing addresses, which may differ from service-providing addresses. Although some addresses were confirmed

as service-providing ones, a substantial number could not be verified. The current HFS database includes only this limited information for noninstitutional providers. HFS is scheduled in 2021 to move to an improved and expanded database that will contain deeper data on provider types, locations, and diagnoses. Improved data will allow research to be done on outpatient utilization trends and more detailed analyses on the relationship between hospital-level care and outpatient utilization.

Limited Patient-Level Demographic Data

The FY2018 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/discharge dates, diagnosis (ICD-10 code), and whether the encounter was for an emergency department visit, an inpatient hospital admission, renal visit or an outpatient service encounter. In a related table, joined by the "RecipientID" code, the data contain the following fields for each patient: date of birth, gender, race, and zip code. The data on race is limited because race is not required to be collected. As a result, race is listed as "unknown" in approximately 30–40% 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 Determinants of Health Data

The absence of patient-level information on social, cultural, and economic characteristics, health-related behaviors, and other social determinants of health (SDOH) characteristics is another constraint. Its absence limits understanding how specific aspects of the patient's lived experience drive the health outcomes observed. Associating patient-level utilization and other health outcome data with patient-level SDOH factors would provide insight into what specific SDOH 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 association of patient-level Medicaid utilization data with patient-level social determinants of health data.

Need for Hyper-Local Neighborhood Social Determinants of Health Data

Local neighborhood data on social determinants of health (SDOH) 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 SDOH-related 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 determinants of health data with patient-level utilization and health outcome data.

Need for Patient-Level Co-Morbidity 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. It is recommended that the State develop the capacity to integrate

information on the primary diagnosis with secondary diagnoses for each clinical encounter.

Lack of Maternal-Child Health Outcomes Assessment

This report does not assess maternal-child health (MCH) 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:

1. There's no infant-to-mother record linkage in the data. A cogent analysis of premature births, for example, requires maternal variables such as age and race/ethnicity. 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).
2. Prenatal care visits were not identifiable in the provided outpatient data. This meant that even if rates of adverse MCH outcomes could have been estimated, it would still not be possible to trace associations of these outcomes back to inadequate prenatal care.
3. Illinois mortality data was received too late in the project to allow an analysis of maternal and infant mortality in 2018 (see Lack of Mortality Data).

The effects of these data limitations were such that attempts to assess rates of premature birth and stillbirths across these 5 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 MCH analyses in this report. Given more time, the data team could correct suspected omissions in the ICD-10 codes used to identify adverse MCH events, and work with HFS to develop a data set more appropriate for these analyses. Using this data set and the mortality data, a future detailed assessment of maternal-child health outcomes, including maternal mortality and poor outcomes in pregnancy or with newborns, could address the gaps in this report and help inform how the State could effectively address maternal health and childbirth.

Lack of Mortality Data

The data analysis team requested mortality data in late 2019 to pair with the Medicaid utilization data, but data was not available until November 2020. In the future, the mortality data can be used to analyze maternal-child health outcomes and it can be paired with hyper-local social determinants of health data to better understand key social factors driving early mortality.

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 our study areas. However, there are additional benchmarks needed for comparison,

specifically, national PQI rates for Medicaid recipients, Illinois PQI rates and Illinois Medicaid PQI rates. In terms of national PQI rates for Medicaid recipients, AHRQ provides tables of nationwide comparative rates for PQIs stratified by insurance status (as well as by sex and age group). However, the process for extracting stratified insurance status rates turns out to be a long process and wasn't feasible to complete for this study. This extraction can be done in the future. For Illinois PQI rates (general and Medicaid populations), the data needed to calculate these rates was not available for this study. However, the data analysis team has been in contact with the Illinois Division and Health Data and Policy to discuss the feasibility of obtaining state-wide hospital discharge data stratified by insurance status for future use.

Resource Data for Geo-Spatial Analyses ("Resource Gaps")

The geo-spatial analyses of mental illness / substance use disorder resources in this report used a comprehensive database of facilities from SAMHSA. The analysis combined inpatient and outpatient behavioral health facilities. In future analyses, inpatient and outpatient facilities should be separated. In addition, facilities should be reviewed to isolate those that treat substance use disorder and new geo-spatial analyses should be completed based on this isolated set of facilities.

Lack of publicly available data sets hampered additional geo-spatial analyses related to ACSCs. The research team was unable to locate a comprehensive, public data set for primary care facilities and services nor were they able to locate a public data set for the following specialty care facilities and services: endocrinology (for diabetes), cardiology (for hypertension and heart disease) and pulmonology and allergists (for asthma/COPD). Finally, no comprehensive databases could be located to do these geo-spatial analyses of the following: dentists, walk-in clinics (retail, stand-alone and urgent care facilities) and full-service grocery stores. The team will continue to try to source ACSC-related data sets for future geo-spatial analyses.

Community Input Limitations

COVID-19

Community input sessions were planned to be in-person, starting in late spring of 2020. The arrival of COVID-19 delayed these sessions and required they be conducted remotely. To reduce barriers to participating remotely, sessions were held via telephone using a WebEx conference call number. It is not known what impact the telephone format had on the feedback. However, the anonymity afforded by telephone conference calls may have enabled participants to express themselves more freely than in-person sessions.

Moderation Challenges

Guided by an equity-driven approach, community-based organizations were hired to recruit and moderate the community input sessions. Community organizations provided staff to serve as moderators. The UIC research team briefed moderators on the topics to be covered during the sessions. Moderators came to the work with different skill levels and experience. The UIC team provided additional moderation training, as needed, to help community organization staff host conversations. Virtual, voice-only moderation prevents moderators from being

able to pick up on visual cues, read body language, and can make it challenging to orchestrate conversational flow. To support moderators with these challenges, a UIC researcher offered real-time prompts via WebEx chat during the sessions to help guide the conversation.

Convenience Sampling Used to Recruit Community Members for Input Sessions

To leverage community partners' networks of readily available existing relationships, a convenience sampling approach was taken to recruit participants for sessions. This approach had the advantage of engaging the community organizations' existing relationships with community members to recruit participants and establish a level of trust with them. A key limitation of convenience sampling is the possibility of underrepresentation of people who are not part of the community partner's network. This situation presents limitations on making generalizations about community residents as a whole.

Limited Minutes on Public Phones

Several seniors who receive their phone plans through public aid were unable to participate due to the limited allocation of minutes on their phone plans.

Opportunities for Future Research

Despite the data and community input limitations listed above, 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 future planned state-funded 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. Finally, the approach taken in this report offers a template that can be applied to additional areas in Illinois.

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Appendices

Appendix A:
Approach to Analyzing Medicaid Utilization Data

About Medicaid Utilization Data

To measure health outcomes across the 5 study areas, the team tasked with data analysis focused on FY2018 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 Data Use Agreement, the team received 3 data sets: institutional data, noninstitutional data and a "recipient file."

Institutional Utilization Data
This data set contained Medicaid recipients' healthcare encounters (inpatient admissions, outpatient visits, and emergency department 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 date
- discharge date
- ICD-10 code and description (principal diagnosis for the encounter)
- DRG code (diagnosis related group)

Noninstitutional Utilization Data
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 a visit for behavioral healthcare)
- service date
- ICD-10 code and description (principal diagnosis for the encounter)

(Note: Analysis of the noninstitutional data set was constrained as a result of a) the limited nature of variables for provider type/description and b) some provider zip codes indicating billing addresses rather than service-site addresses. For more details, see the "Limitations and Opportunities for Future Research" section of this report.)

Recipient File Data
This data set contained gender, 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 in analyses include Latinx.
- Age at time of encounter was derived from recipient date of birth.

Collectively, these data sets represent healthcare encounters for FY2018 for all Medicaid recipients living within the zip codes of the study areas defined in this study (specifically, all recipients with home zip codes within the study areas)—in other words, the data track healthcare utilization by Medicaid recipients living in the study areas, regardless of where that care took place.

Approach to Medicaid Utilization DataAnalysis

Non-Prescriptive Approach to Data Analysis

At no point during this research did HFS direct an analytic framework that the UIC team should follow, nor 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 around addressing those questions. In contrast, this project was predominantly data driven. The team approached the data analytics in this project with no pre-formed hypothesis. Using this "data first" approach (rather than question first), 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. As an aside, 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 a Medicaid recipient may have multiple encounters in the data (for example, such as multiple visits to a healthcare provider, ED visits, and/or inpatient hospital stays) for one health condition, a numerator for rate could be number of encounters (which counts multiple encounters of a single patient) or number of unique recipients. Similarly, the denominator to calculate 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 the subject-area scholars.

Descriptive statistics: After getting to know the data sets via review of fields, 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 distribution of healthcare encounters by hospitals. Figures 21 to 27 exhibit the charts for the following analyses:

- For Inpatient Hospitalizations, by Study Area
    - Distribution of Ages of Patients
    - Distribution of Genders of Patients
    - Distribution of Races of Patients

- For Emergency Department (ED) Visits, by Study Area
    - Distribution of Ages of Patients
    - Distribution of Genders of Patients
    - Distribution of Races of Patients

- Market Share of Hospitals Receiving Medicaid Patients from East St. Louis

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

Figure 21: Inpatient Hospitalizations—Distribution of Ages of Patients by Study Area

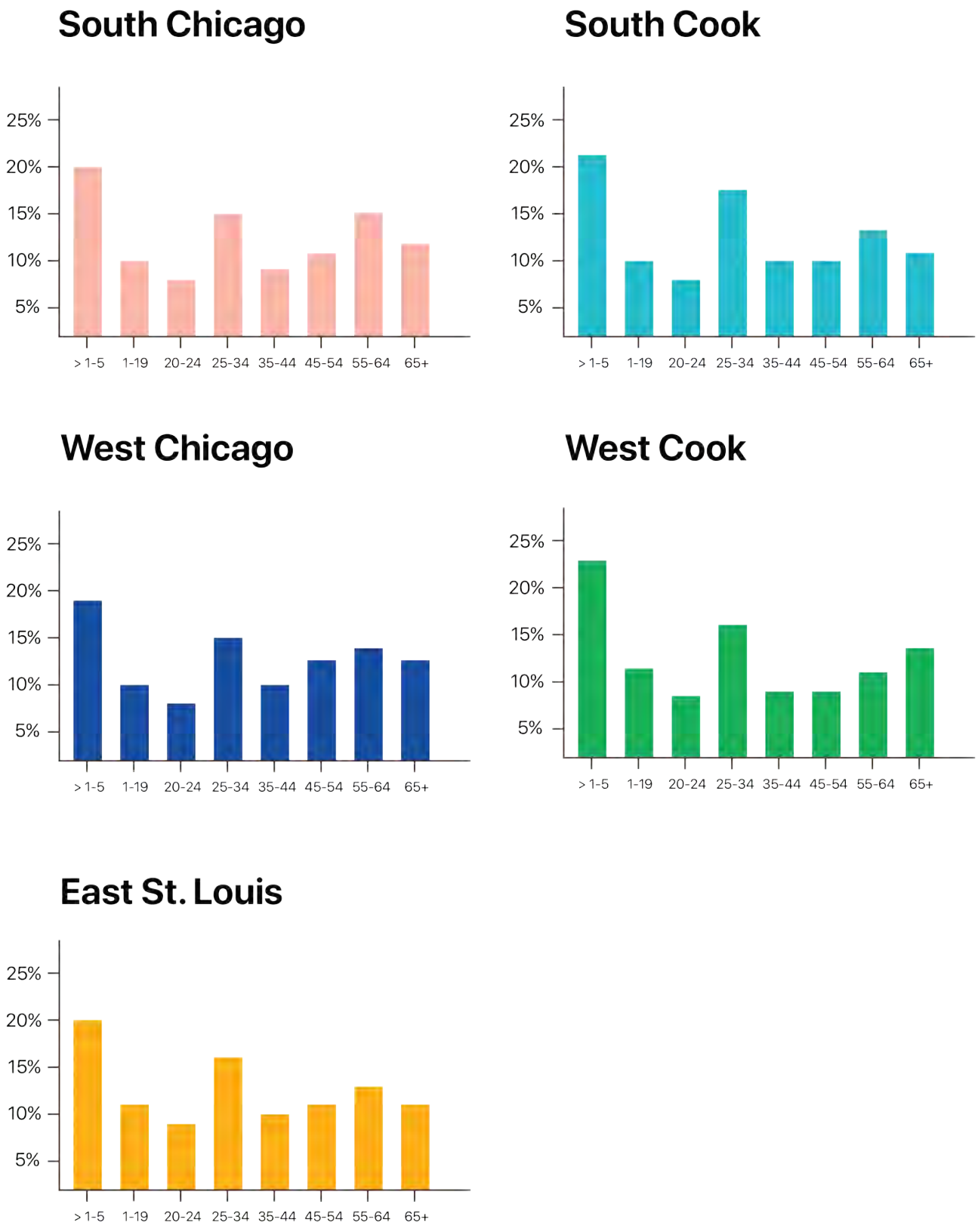


Figure 22: Inpatient Hospitalizations—Distribution of Genders of Patients by Study Area

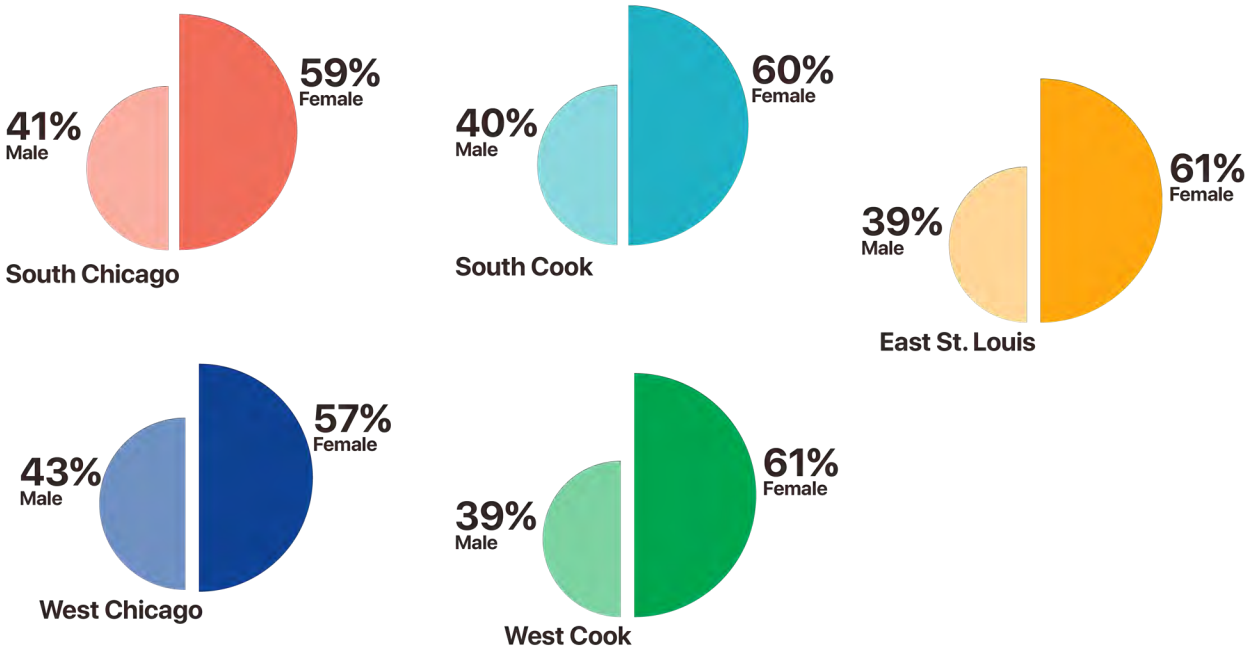


Figure 23: Inpatient Hospitalizations—Distribution of Races of Patients by Study Area

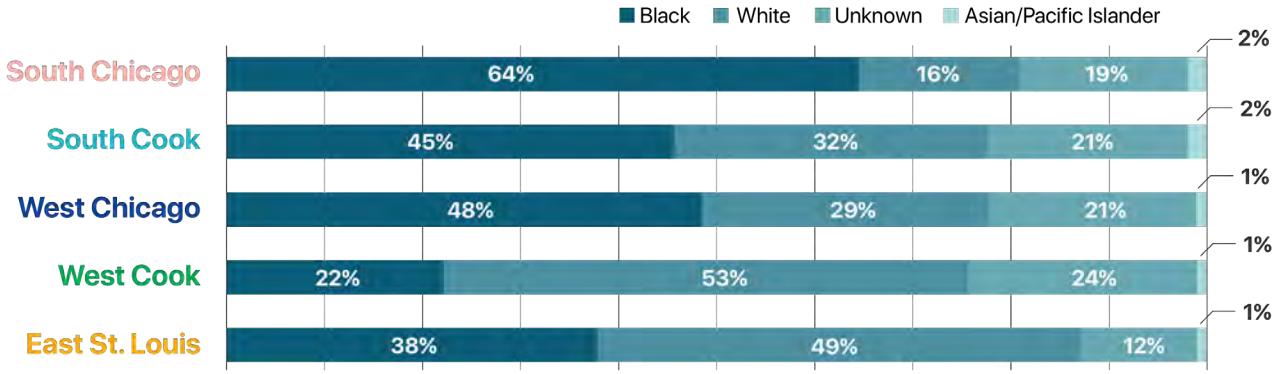


Figure 24: ED Visits—Distribution of Ages of Patients by Study Area

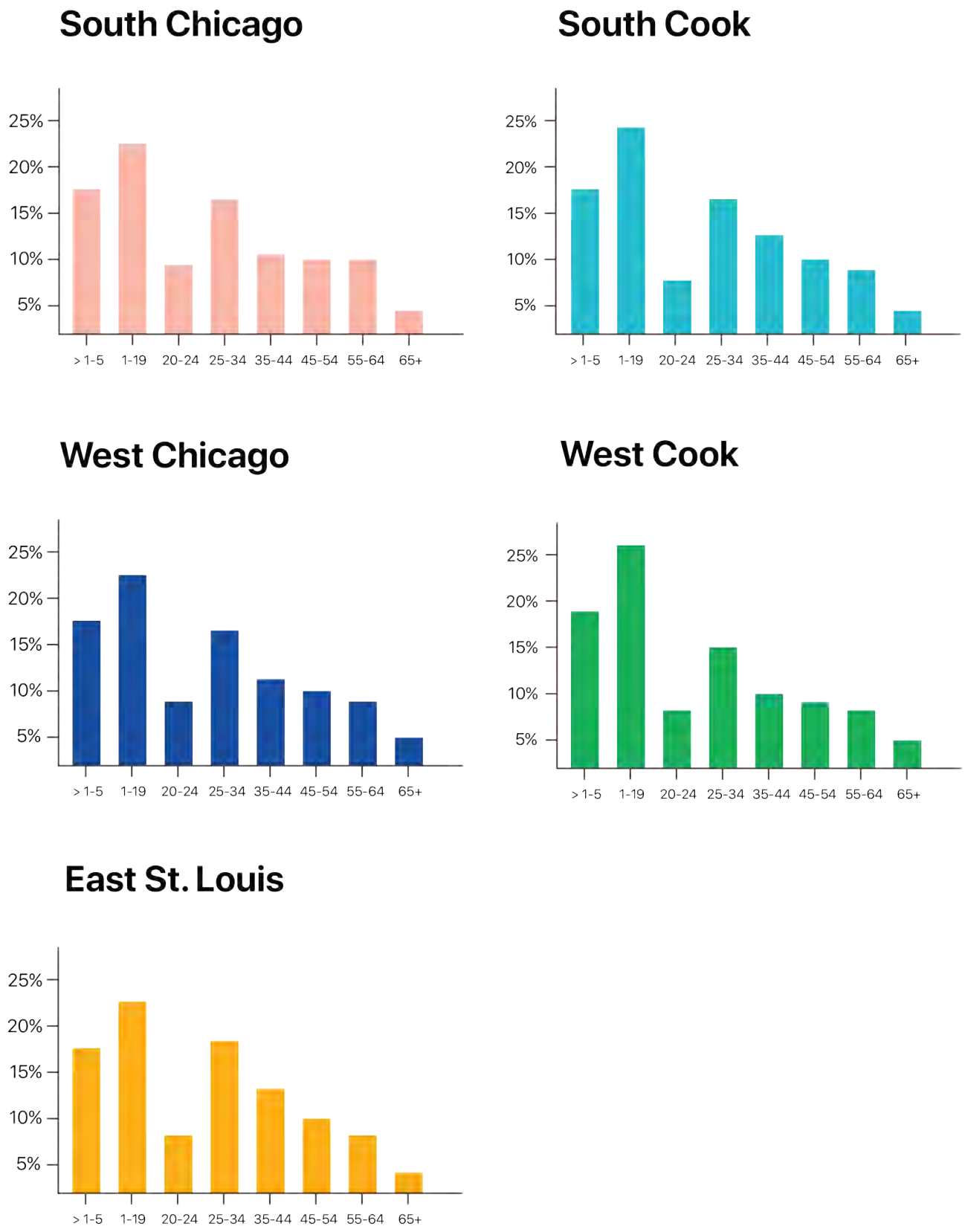


Figure 25: ED Visits—Distribution of Genders of Patients by Study Area

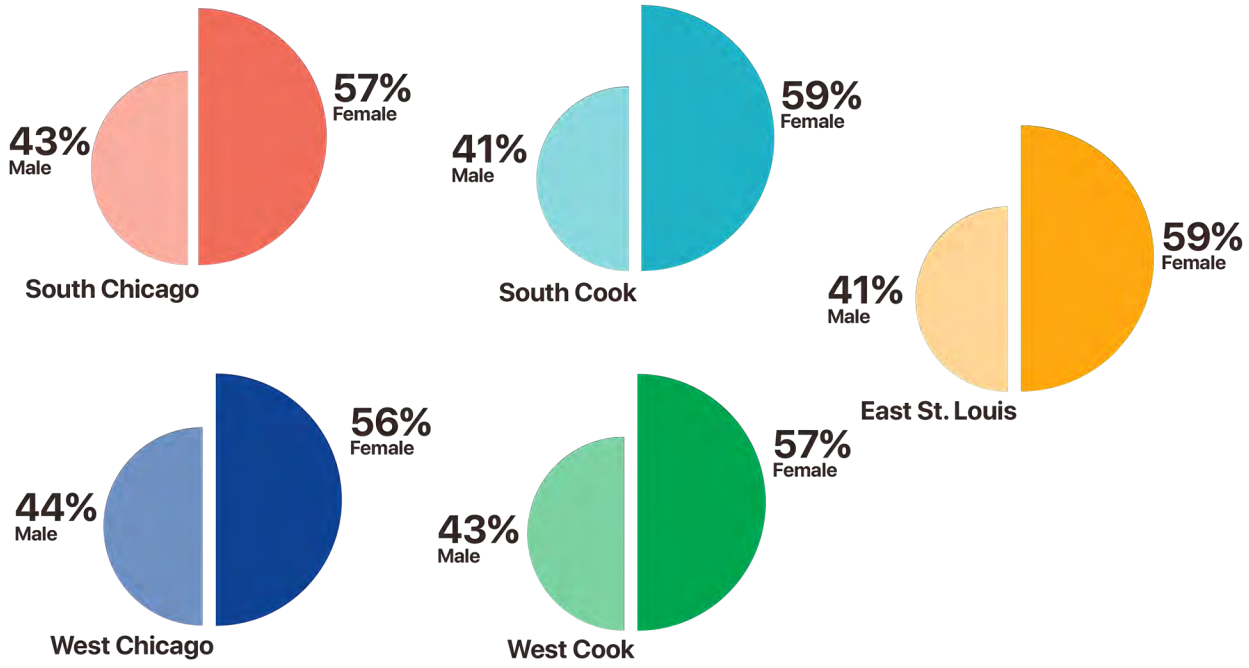


Figure 26: ED Visits—Distribution of Races of Patients by Study Area

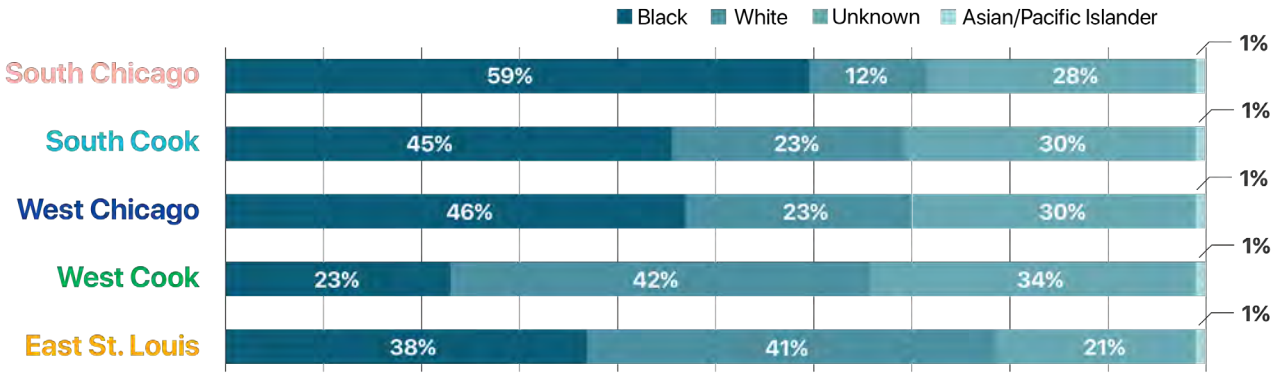
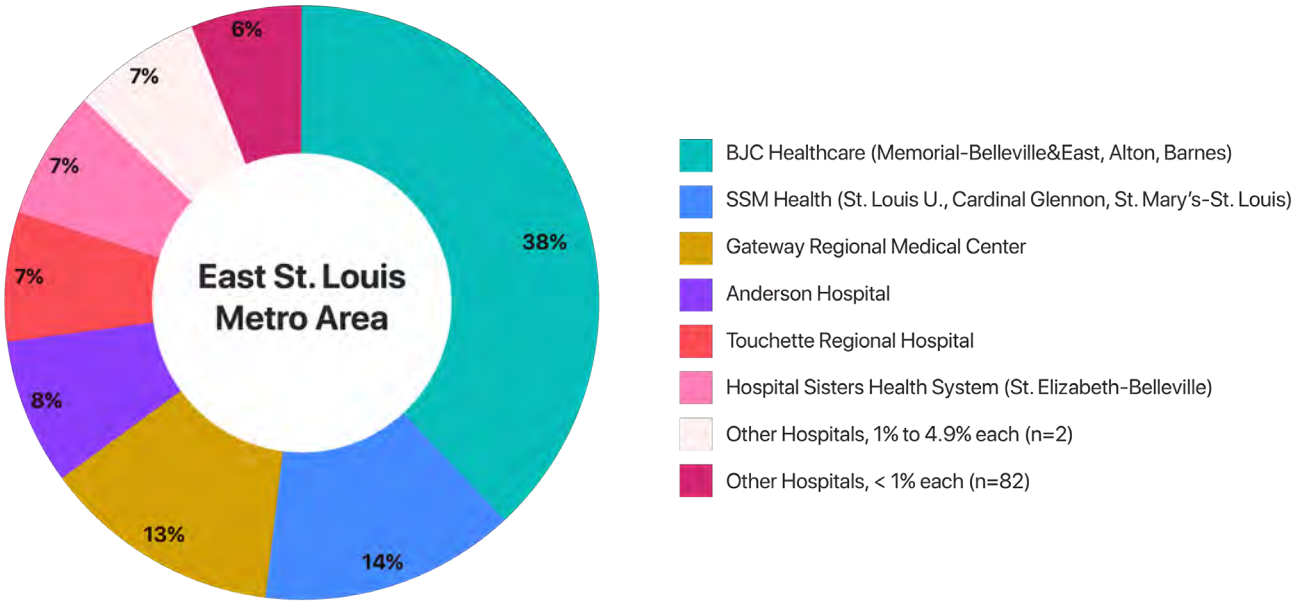


Figure 27: Estimated Share of East St. Louis Metro Area Medicaid Enrollees Admitted to the Hospital (Share of hospitals receiving Medicaid enrollees who live in the East St. Louis study area as patients for FY2018)



Bivariate sssociations: The data analytics team also investigated bivariate associations, such as associations between health conditions (that is, principal diagnoses 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, across race and across the 5 study areas. Included in the Findings section of this report are the key bivariate associations that drove insights about the utilization data: principal diagnoses disease blocks by resource intensiveness defined by length of stay, hospital readmission, and early hospital readmission.

Logistic regressions: While primary association studies were based on descriptive subgroup or stratified analysis, the data analytics team also performed a limited set of advanced inferential statistical analysis using bivariable and multivariable regression analyses. Most importantly, regression analyses were used to understand demographic characteristics of Medicaid patients most associated with diseases of interest: bipolar and depressive disorders, alcohol and opioid use disorders and ACSCs (asthma/COPD, congestive heart failure, hypertensive disease or diabetes).

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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 both multiple diagnoses were included in more than one logistic regression. For example, if a patient had both a bipolar diagnosis and a depressive disorder diagnosis, that patient was included in logistic regressions for both conditions. The covariate for the logistic regression included all the demographic covariates available in the data, these being age, race, gender and study area.

See Appendix section "Additional Analyses and Community Input for Selected Disease Groups and Conditions" for tables containing the results of the logistic regressions (odds ratios, confidence intervals and p-values for each disease) for bipolar and depressive disorders, alcohol and opioid use disorders, and ACSCs.

Appendix B:

Additional Analyses and Community Input for Select Disease Groups and Conditions

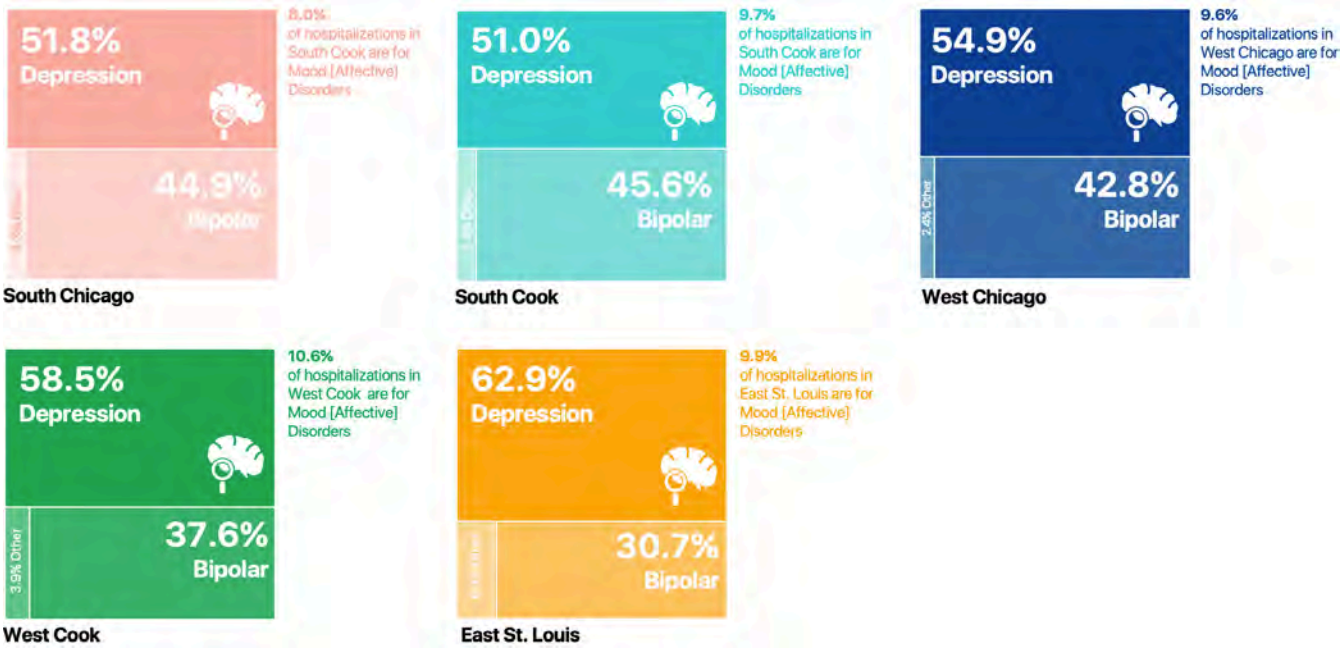
Bipolar and Depressive Disorders

After identifying the key disease groups and conditions (mental illness, psychoactive substance use disorders and ACSCs), the data analytics team conducted additional analyses to develop a fuller understanding of these conditions. In addition, the team isolated community input information about barriers to mental illness prevention and care.

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 healthy and out of the hospital.

The data analytics team looked at the frequency distribution of hospitalizations for these disorders across study areas (see Figure 28).

Figure 28: Proportion of Hospitalizations for Depressive Disorders, Bipolar Disorders and Other ICD-10s[1] within the Mood [Affective] Disorders Block across Study Areas



[1]Depression in the above charts includes all "depressive disorder" ICD-10s in the mood [affective] disorders block. Bipolar includes all ICD-10s labeled "bipolar." The "other" category includes cyclothymic disorder, dysthymic disorder, manic episodes with and without psychotic symptoms, persistent mood [affective] disorders, and unspecified mood [affective] disorders.

Multivariate logistic regressions were performed to determine the population characteristics most associated with patients with bipolar and depressive disorders. Significant interaction between age and race groups for bipolar and depressive disorder diagnoses was observed. To minimize this interaction, 3 age categories (12–19, 20–40, >40) were created and separate analyses performed for each age group.

Tables 9 and 10 contain the results of the logistic regressions. 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).

Summary of Population Characteristics Most Associated with Patients with Bipolar and Depressive Disorders

Bipolar Disorders:

- Black and white youth (male or female), ages 12–19
- Black and white males, ages 20–40
- Black and white males over ages 40

Depressive Disorders:

- White females, ages 12–19
- White males, ages 20–40
- White males, over age 40, particularly in West Chicago

Table 9: Population Characteristics Associated with Depressive Disorder Patients

Depressive Disorders		Confidence Interval			
	Odds Ratio	Lower Limit	Upper Limit	P-Value	Reference Groups
Age Group: 12 to 19					
Black	0.87	0.79	0.96	0.0039	vs. Other/Unknown
White	1.26	1.15	1.38	<.0001	
Male[1]	0.51	0.47	0.55	<.0001	vs. Female
East St. Louis	0.59	0.52	0.68	<.0001	vs. West Cook
South Chicago	0.70	0.63	0.79	<.0001	
South Cook	0.63	0.55	0.71	<.0001	
West Chicago	0.73	0.65	0.82	<.0001	
Age Group: 20 to 40					
Black	0.83	0.75	0.92	0.0003	vs. Other/Unknown
White	1.59	1.43	1.77	<.0001	
Male	1.97	1.84	2.10	<.0001	vs. Female
East St. Louis	0.79	0.70	0.89	0.0001	vs. West Cook
South Chicago	0.73	0.65	0.82	<.0001	
South Cook	0.82	0.73	0.92	0.0005	
West Chicago	0.89	0.80	1.00	0.0411	
Age Group: Over 40					
Black	1.07	0.97	1.19	0.1628	vs. Other/Unknown
White	1.63	1.47	1.81	<.0001	
Male	1.17	1.10	1.24	<.0001	vs. Female
East St. Louis	0.87	0.77	0.99	0.0285	vs. West Cook
South Chicago	0.92	0.82	1.03	0.1367	
South Cook	0.69	0.61	0.78	<.0001	
West Chicago	1.45	1.31	1.62	<.0001	

[1] Low odds ratio for males in the 12 to 19 group means that females of this age range are associated with depressive disorders.

Table 10: Population Characteristics Associated with Bipolar Disorder Patients

Bipolar Disorders		Confidence Interval			
	Odds Ratio	Lower Limit	Upper Limit	P-Value	Reference Groups
Age Group: 12 to 19					
Black	1.59	1.37	1.85	<.0001	vs. Other/Unknown
White	1.29	1.08	1.53	0.0048	
Male	0.93	0.82	1.07	0.3145	vs. Female
East St. Louis	0.57	0.43	0.75	<.0001	vs. West Cook
South Chicago	0.74	0.60	0.92	0.0056	
South Cook	1.16	0.94	1.43	0.1722	
West Chicago	0.61	0.48	0.77	<.0001	
Age Group: 20 to 40					
Black	1.14	1.00	1.30	0.0471	vs. Other/Unknown
White	1.66	1.45	1.90	<.0001	
Male	2.80	2.59	3.03	<.0001	vs. Female
East St. Louis	0.56	0.48	0.67	<.0001	vs. West Cook
South Chicago	0.93	0.81	1.07	0.3013	
South Cook	1.00	0.87	1.15	9.7804	
West Chicago	0.99	0.86	1.15	0.9241	
Age Group: Over 40					
Black	1.52	1.31	1.76	<.0001	vs. Other/Unknown
White	1.89	1.63	2.21	<.0001	
Male	1.60	1.47	1.74	<.0001	vs. Female
East St. Louis	0.68	0.56	0.81	<.0001	vs. West Cook
South Chicago	1.08	0.93	1.26	0.3364	
South Cook	0.87	0.73	1.02	0.0860	
West Chicago	1.37	1.18	1.59	5.7214	

From Community Input: Barriers Specific to Mental Illness

In community input sessions, residents described specific barriers related to preventing and managing mental illness. Barriers specific to preventing and getting treatment for mental illness included lack of knowledge and coping mechanisms related to signs and symptoms, social stigma, lack of relevant and adequate resources, and strain on the social support system.

Lack of knowledge and coping mechanisms related to signs and symptoms of mental illness: Residents spoke of traumatic stress experienced in their communities due to street violence, domestic abuse, childhood abuse, unemployment, and racial discrimination. Many participants linked trauma to mental illness and recounted personal stories of untreated symptoms due to not knowing what to look for and social stigma associated with labeling a need and seeking help. In these conversations, mental illness was conceived of in narrow terms, characterized as a person experiencing psychosis without reference to behavioral health issues like mood swings, anxiety, and disordered eating/sleeping.

Social stigma associated with mental illness: Latinx and Black residents described social stigma surrounding mental illness in their communities and spoke of it being internalized and perpetuated within the families. Residents of Little Village in West Chicago cited a culture of "machismo" in the predominantly Mexican community as a factor that keeps male residents from acknowledging the need for help or seeking it out. Several church-going residents described the tendency to "pray about it" rather than seek professional support. A pastor from that same community talked about advocating for professional psychological intervention rather than turning solely to "faith" or "prayer."

Racial discrimination when seeking care for mental illness: Residents with mental illness described experiencing racial discrimination from healthcare professionals. Several shared stories of attempts to seek medical support that resulted in arrest.

Lack of adequate and appropriate resources: Residents spoke of the lack of community-based, culturally and linguistically relevant mental health resources especially for those with public insurance. They described it taking a long time to book an appointment at mental health facilities and upon arrival at the facilities, experiencing long wait times before being seen. Perceptions based on these experiences was that the quality of care was sub-adequate. Black residents described a marked service quality disparity between healthcare facilities in Black and white neighborhoods. A repeated recommendation was to build pipelines of therapists and clinicians of color to develop interventions informed by the Black-lived experience and create a foundation for trusting, therapeutic relationships.

Strain on support system: Caring for a loved one with unmanaged advanced mental illness is emotionally exhausting. Caregivers sometimes don't know where to seek help or fear that seeking help will lead to an interaction with the criminal justice system. Multiple conversations included community residents who have family members living with bipolar disorder. They are often frustrated and feel helpless due to an inability to meaningfully intervene through cycles of hospitalization and denial.

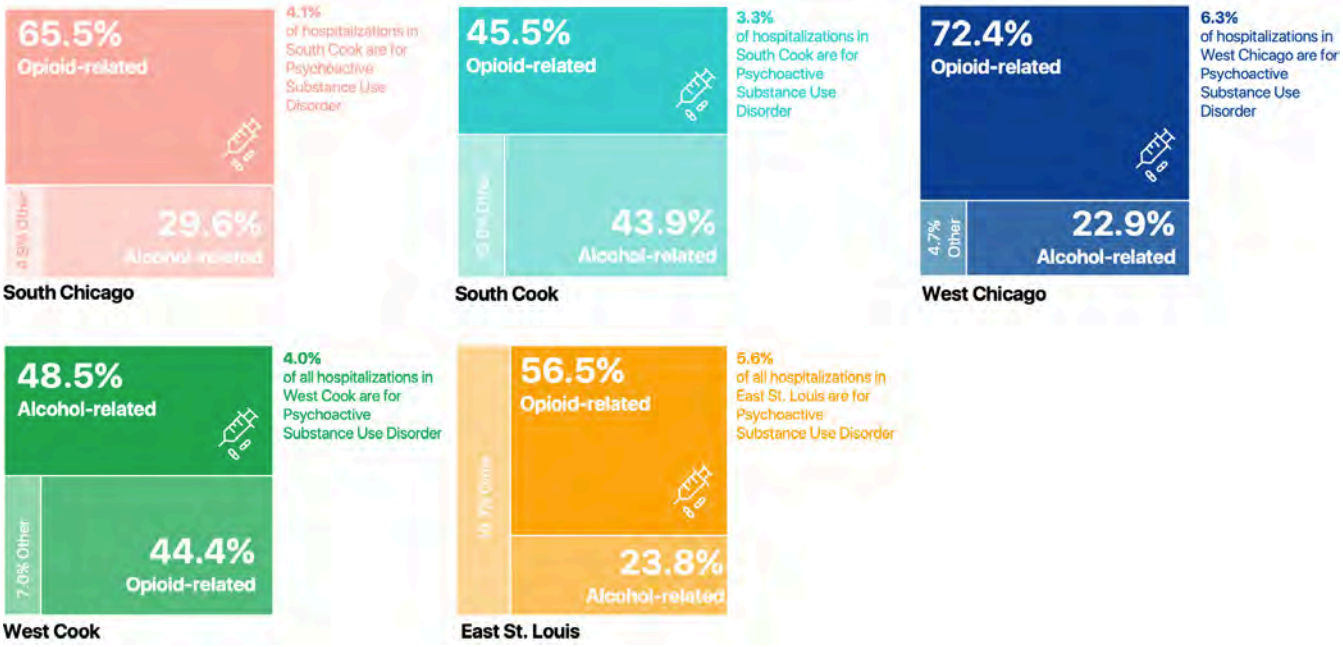
Overall, residents expressed a need to normalize conversations about mental health supported not only by education about available early intervention resources in the community but also by guidance for families, law enforcement, and the community at large on how to handle people when they are having a mental health crisis.

Alcohol and Opioid Use Disorders

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

The data analytics team looked at the frequency distribution of hospitalizations for these disorders across study areas (see Figure 29).

Figure 29: Proportion of Hospitalizations for Alcohol Use Disorders, Opioid Use Disorders and Other ICD-10s within the Psychoactive Substance Use Disorders Block across Study Areas



(Note: "Other" psychoactive substance use disorders include those for cannabis, cocaine, hallucinogens, sedatives and other psychoactive substances or stimulants.)

Multivariate logistic regressions were done to determine the population characteristics most associated with patients with alcohol and opioid use disorders. Analysts observed significant interaction between age and race groups for alcohol and opioid use disorders diagnoses. To minimize this interaction, 3 age categories (12–19, 20–40, >40) were created and separate analyses performed for each age group.

Tables 11 and 12 contain the results of the logistic regressions. 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).

Summary of Population Characteristics Most Associated with Patients with Alcohol and Opioid Use Disorders

Alcohol Use Disorders:

- White youth (male or female), ages 12–19
- Black and white males, ages 20–40
- Black and white males, over age 40

Opioid Use Disorders:

- White males, ages 20–40, particularly in East St. Louis Metro, West Chicago, and South Cook
- Black and white males over age 40, particularly in West and South Chicago

Table 11: Population Characteristics Associated with Alcohol Use Disorder Patients

Alcohol Use Disorders		Confidence Interval		
	Odds Ratio	Lower Limit	Upper Limit	P-Value
Age Group: 12 to 19				
Black	0.98	0.68	1.39	0.9284
White	1.78	1.30	2.43	0.0003
Male	1.16	0.89	1.52	0.2761
East St. Louis	0.51	0.31	0.83	0.0077
South Chicago	0.45	0.30	0.69	0.0002
South Cook	0.75	0.50	1.13	0.1614
West Chicago	0.65	0.43	0.98	0.0399
Age Group: 20 to 40				
Black	1.17	1.03	1.34	0.0169
White	1.73	1.51	1.99	<.0001
Male	4.10	3.78	4.45	<.0001
East St. Louis	0.59	0.50	0.69	<.0001
South Chicago	0.82	0.71	0.94	0.0034
South Cook	0.78	0.68	0.91	0.0009
West Chicago	0.98	0.85	1.12	0.7598
Age Group: Over 40				
Black	1.50	1.34	1.68	<.0001
White	1.95	1.73	2.20	<.0001
Male	4.45	4.14	4.80	<.0001
East St. Louis	0.78	0.68	0.90	0.0006
South Chicago	1.13	1.00	1.27	0.0506
South Cook	1.03	0.91	1.17	0.6619
West Chicago	1.12	0.99	1.27	0.0709

Table 12: Population Characteristics Associated with Opioid Use Disorder Patients[1]

Opioid Use Disorders		Confidence Interval			
	Odds Ratio	Lower Limit	Upper Limit	P-Value	Reference Groups
Age Group: 20 to 40					
Black	0.61	0.50	0.76	<.0001	vs. Other/Unknown
White	3.47	2.88	4.20	<.0001	
Male	4.42	3.97	4.93	<.0001	vs. Female
East St. Louis	1.88	1.56	2.28	<.0001	vs. West Cook
South Chicago	1.06	0.86	1.30	0.5921	
South Cook	1.44	1.18	1.76	0.0003	
West Chicago	1.28	1.05	1.57	0.0164	
Age Group: Over 40					
Black	2.84	2.52	3.21	0.0000	vs. XXXXX
White	1.16	1.00	1.34	0.0456	
Male	3.13	2.92	3.35	0.0000	vs. Female
East St. Louis	0.49	0.40	0.59	0.0000	vs. West Cook
South Chicago	1.26	1.10	1.45	0.0013	
South Cook	0.55	0.46	0.65	0.0000	
West Chicago	2.50	2.18	2.88	0.0000	

[1] Since there were few instances of care encounters for opioid use disorder among patients 12–19 years of age, no associations could be determined for this particular age group.

From Community Input: Conditions and Barriers Specific to Substance Use Disorders

In community input sessions, residents described conditions and barriers related to preventing and managing substance use disorders. Residents referenced general conditions that make communities more vulnerable to substance use disorders, including the omnipresence of drugs and users in communities, high rates of unemployment and a lack of resources for extra-curricular activities, opportunities for personal growth, and professional advancement. Additionally, a marked increase in drug trafficking and consumption throughout the COVID-19 pandemic came up in several conversations.

Specific barriers to preventing and getting treatment for substance use disorders include undiagnosed and untreated mental illness, a scarcity of accessible treatment and rehabilitation facilities, and strain on the social support system.

Undiagnosed, untreated mental illness: Community residents spoke of substance use as a way some people cope with undiagnosed mental illness. The lack of tools to process and manage trauma and chronic stress, and the social stigma associated with seeking help, leads some community members to self-medicate with drugs.

Scarcity of effective treatment and rehabilitation programs: Care access barriers included a scarcity of local treatment options due to facility closures, long wait lists, and providers that don't take one's insurance. Residents with firsthand experience with substance use

commented that such barriers close the window of opportunity to "get clean" and make it more likely for someone to continue to use. Experiences with ineffective interventions due to short program duration and negative responses to methadone (for example, it leading to an increase in using behavior post discharge) were also mentioned. Those in recovery spoke to a lack of local peer support groups (for example, 12-step programs) due to government funding cuts or COVID-19. Multiple residents described being abruptly released after a hospital stay and/or prison time without appropriate follow-up to continue and reinforce rehabilitation. The lack of transition support makes it more likely that residents in recovery will relapse with some ending up back in the criminal justice system.

Strain on social support system: Several resident participants described how addiction isolates individuals and strains families. These conversations point to the need for upstream interventions including workforce development programs, coping resources, community-based treatment centers and rehab programs, and local peer support groups.

Ambulatory Care Sensitive Conditions

Ambulatory care sensitive conditions (ACSCs) 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 (13) and they are some of the most frequent and resource intensive conditions in the FY2018 Medicaid institutional data. In fact, ACSCs account 10–16% of all care encoun¬ters in the institutional data across study areas (see Figure 30).

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 31).

ACSCs were analyzed using 2 different categorization schemes:

- type of ACSC (acute, chronic, and avoidable)
- ACSC Preventive Quality Indicators (PQI)

Types of ACSCs: Ambulatory care sensitive conditions are categorized as acute, chronic or avoidable (25). For each of these types of ACSCs, hospitalizations can be reduced through timely and effective outpatient care to:

- control an acute, episodic illness or condition (acute ACSCs)
- manage a chronic disease or condition (chronic ACSCs)
- prevent the onset of an illness or condition (avoidable ACSCs)

Table 13 lists the conditions included in each of these categories.

Figure 30: Distribution of Care Encounters for ACSCs and Non-ACSCs by Study Area

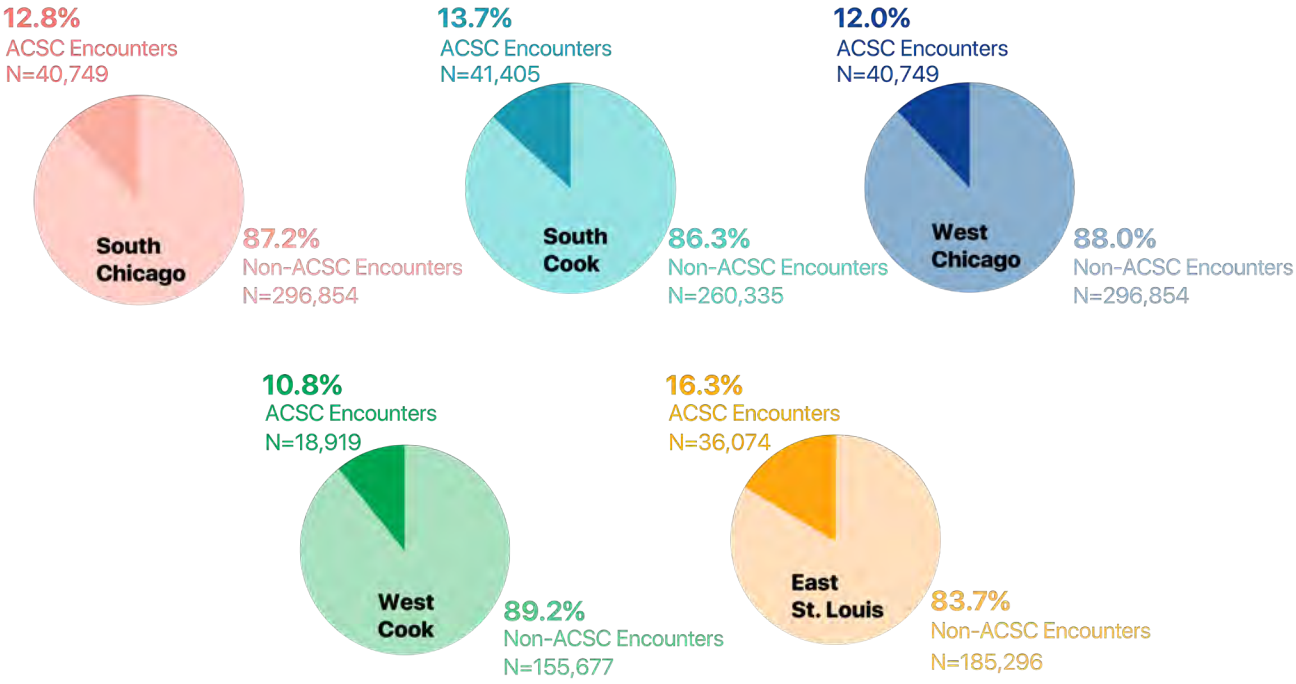


Figure 31: Distribution of Point of Care for ACSCs by Study Area

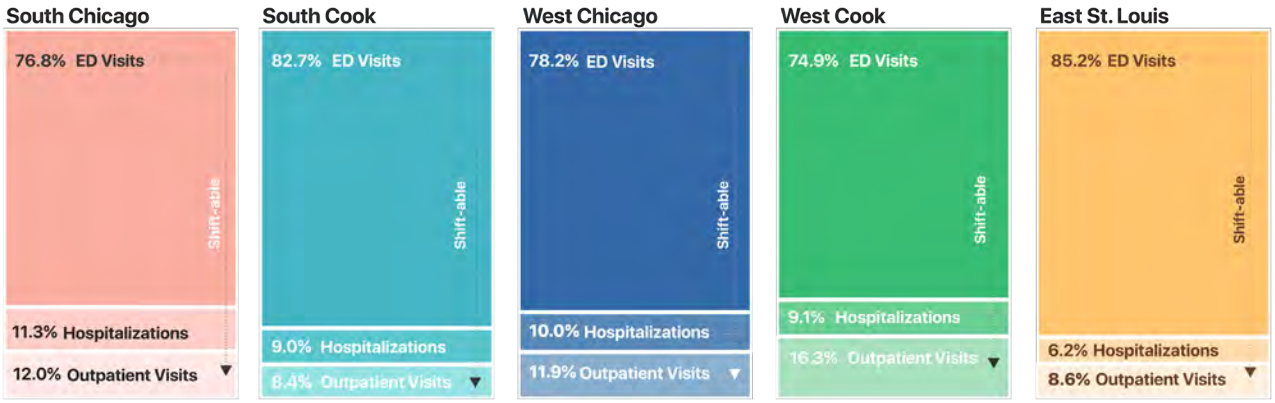


Table 13: Diseases Comprising Acute, Chronic, and Avoidable ACSCs

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		

The conditions above were mapped to ICD-10 codes in the data in order to identify each type of ACSC. Both ED visit and inpatient hospitalization data are combined to analyze these types of ACSCs.

Preventative Quality Indicators: 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 (25). 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) (16).

PQIs measures include the following composite and disease-specific measures of inpatient hospitalization diagnoses:

Table 14: Composite and Disease-Specific PQIs

PQI 90 Composite—Combined Measure of Acute and Chronic PQI Measures	
ACUTE—PQI 91 Composite	**CHRONIC—PQI 92 Composite**
Disease-Specific Acute PQIs	Disease-Specific Chronic PQIs
PQI 11 Bacterial Pneumonia Admission Rate	PQI 93 Diabetes Hospitalization Composite (combined measure of 01, 03, and 14)
PQI 12 Urinary Tract Infection Admission Rate	PQI 01 Diabetes, Short-Term Compli cations Admission Rate
	PQI 03 Diabetes, Long-Term Compli cations 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 Admission Rate
	PQI 15 Asthma, Younger Adults (18 to 39) Admission Rate
	PQI 16 Rate of Lower Extremity Amputation among Patients with Diabetes

Acute, Chronic and Avoidable ACSC Analyses
For acute, chronic, and avoidable ACSCs, the following data analyses were done:

- crude rates of ACSC diseases across study areas
- association between population characteristics and type of ACSC

For these analyses, both ED visit and inpatient hospitalization data was used. It's also important to note that the same approach used to calculate associated population characteristics for mental illness and substance use disorders was used to determine population characteristics associated with acute, chronic, and avoidable ACSCs.

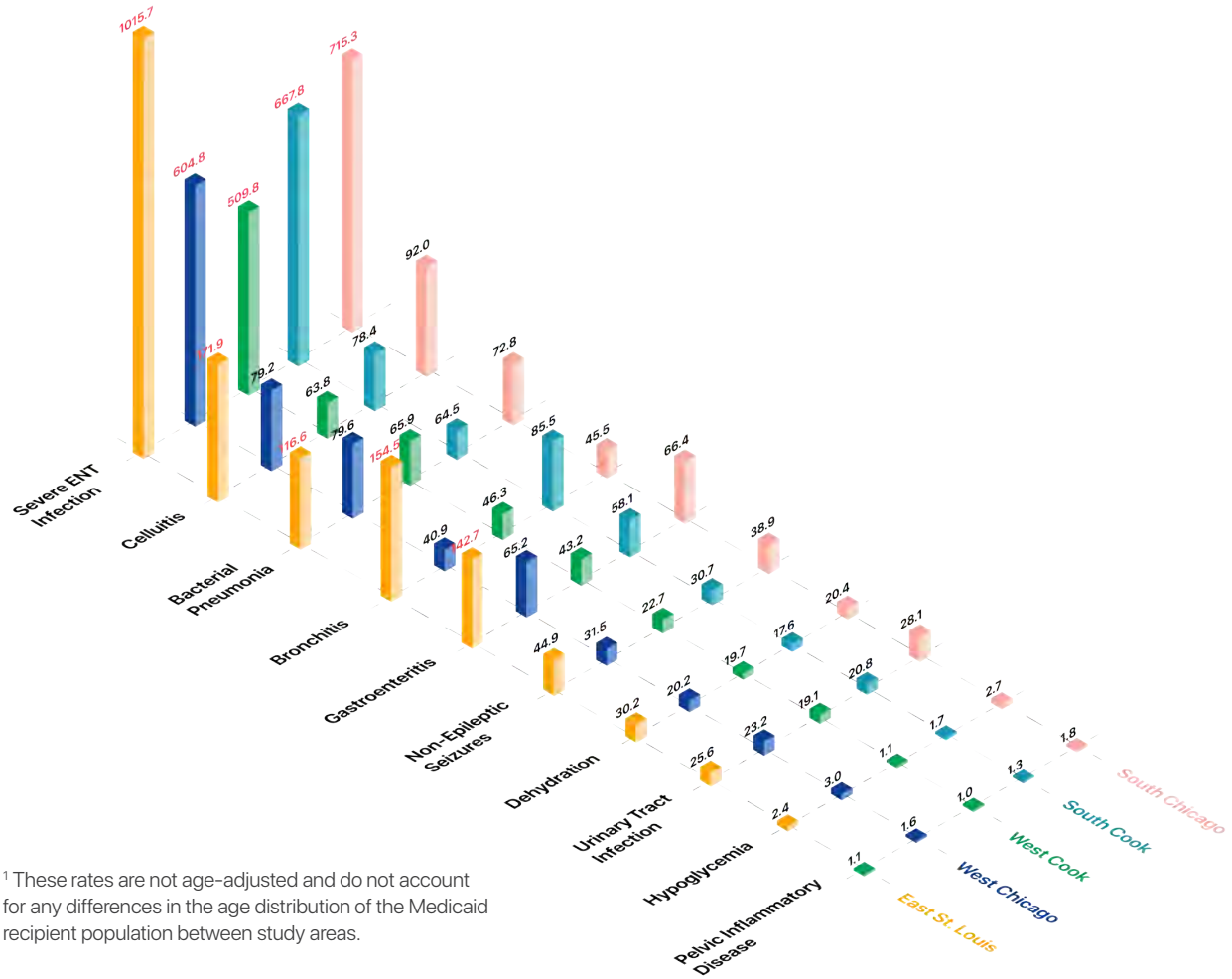
Key findings for acute, chronic, and avoidable ACSCs are summarized below and Figures 32–34 and Tables 15–17 show the specific results of the analyses.

Acute ACSC Key Findings

- Severe ear, nose, and throat (ENT) infections are the top acute ACSC across areas.
- When we look at the location of care behind these figures, severe ENT infections are the most frequent acute ACSC visit in the emergency department and bacterial pneumonia is the most frequent Acute ACSC in terms of inpatient hospitalization.
- Acute ACSCs are highly associated with young children.
- East St. Louis, South Chicago, and South Cook are particularly burdened by ED visits and inpatient hospitalizations for acute ACSCs.

Note: The association between acute ACSCs and young children is not surprising given that there are several acute ACSCs that often afflict children such as severe ENT infection, bronchitis, non-epileptic seizures (for example, febrile seizures), gastroenteritis, and urinary tract infections.

Figure 32: Most Frequent Acute ACSCs Associated with ED Visits and Hospitalizations by Study Areas (Crude Rates per 10,000 Medicaid Enrollees[1])



[1] These rates are not age-adjusted and do not account for any differences in the age distribution of the Medicaid recipient population between study areas.

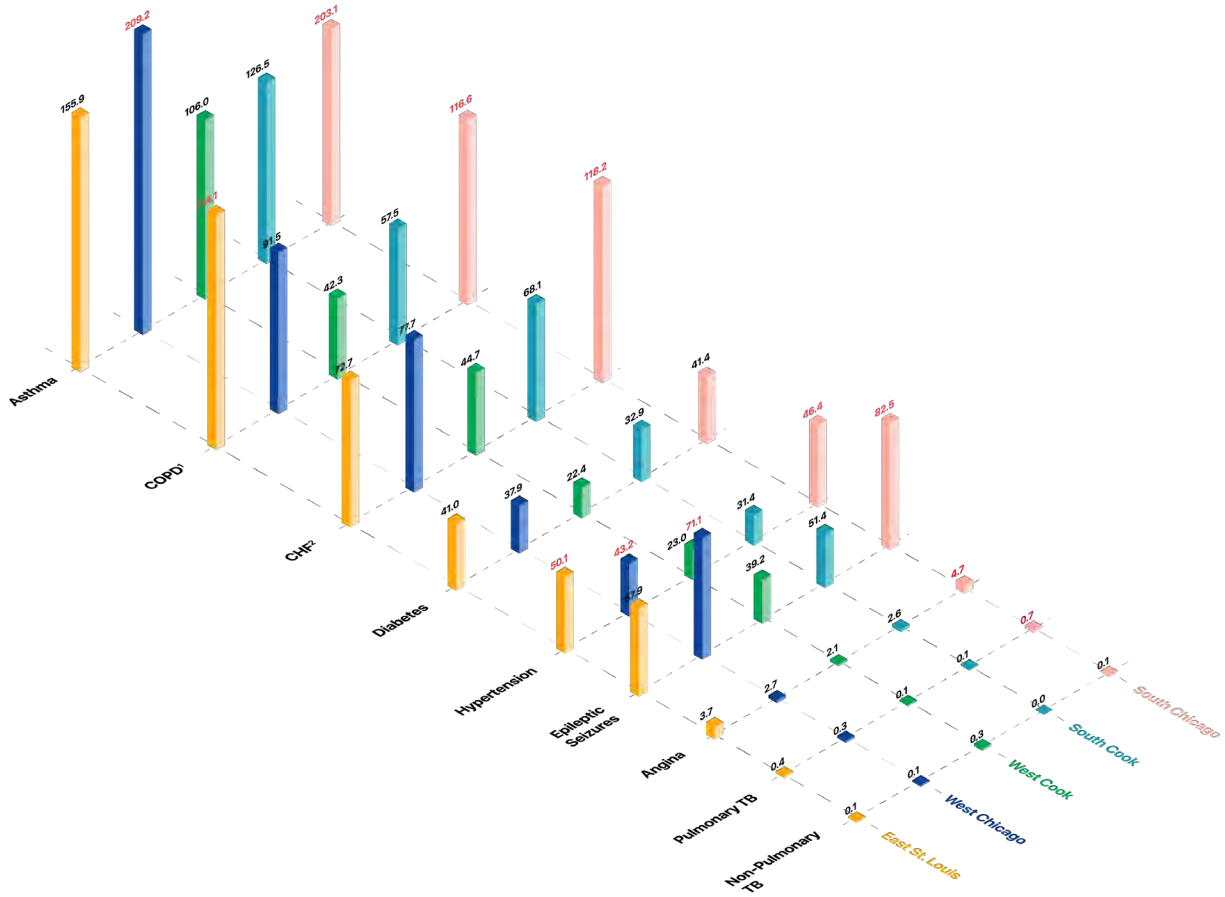
Table 15: Population Characteristics Associated with Acute ACSC Patients

Acute ACSCs		Confidence Interval			
	Odds Ratio	Lower Limit	Upper Limit	P-Value	Reference Groups
< 1 y	3.65	3.56	3.73	<.0001	vs. 25 to 34 y
1 to 2 y	5.74	5.60	5.89	<.0001	
3 to 5 y	4.91	4.78	5.04	<.0001	
6 to 11 y	2.86	2.79	2.93	<.0001	
12 to 14 y	1.58	1.53	1.63	<.0001	
15 to 19 y	1.30	1.26	1.33	<.0001	
20 to 24 y	1.08	1.05	1.11	<.0001	
35 to 44 y	0.86	0.84	0.88	<.0001	
45 to 64 y	0.57	0.56	0.58	<.0001	
≥65 y	0.32	0.31	0.34	<.0001	
Native Am.	0.93	0.81	1.06	0.26	vs. White
Asian/P.I.	0.89	0.84	0.96	0.0009	
Black	1.00	0.98	1.02	0.80	
Other/Unknown	1.12	1.10	1.14	<.0001	
Male	0.93	0.92	0.94	<.0001	vs. Female
East St. Louis	1.78	1.64	1.93	<.0001	vs. West Cook
South Chicago	1.15	1.05	1.26	0.0039	
South Cook	1.40	1.29	1.52	<.0001	
West Chicago	1.07	0.96	1.20	0.23	

Chronic ACSC Key Findings

- Asthma, chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF), diabetes, hypertension, and epileptic seizures are the top chronic ACSCs.
- When we look at the location of care behind these figures, asthma and COPD are the most frequent chronic ACSC visits in the emergency department, and CHF is the most frequent chronic ACSC inpatient hospitalization.
- ED visits and hospitalizations for chronic ACSCs are associated with Black and Native American males from a wide range of ages and in all areas under study.

Figure 33: Most Frequent Chronic ACSC Associated with ED Visits and Hospitalizations by Study Areas (Crude Rates per 10,000 Medicaid Enrollees[3])



[1] Chronic obstructive pulmonary disease
[2] Congestive heart failure
[3] These rates are not age-adjusted and do not account for any differences in the age distribution of the Medicaid recipient population between study areas.

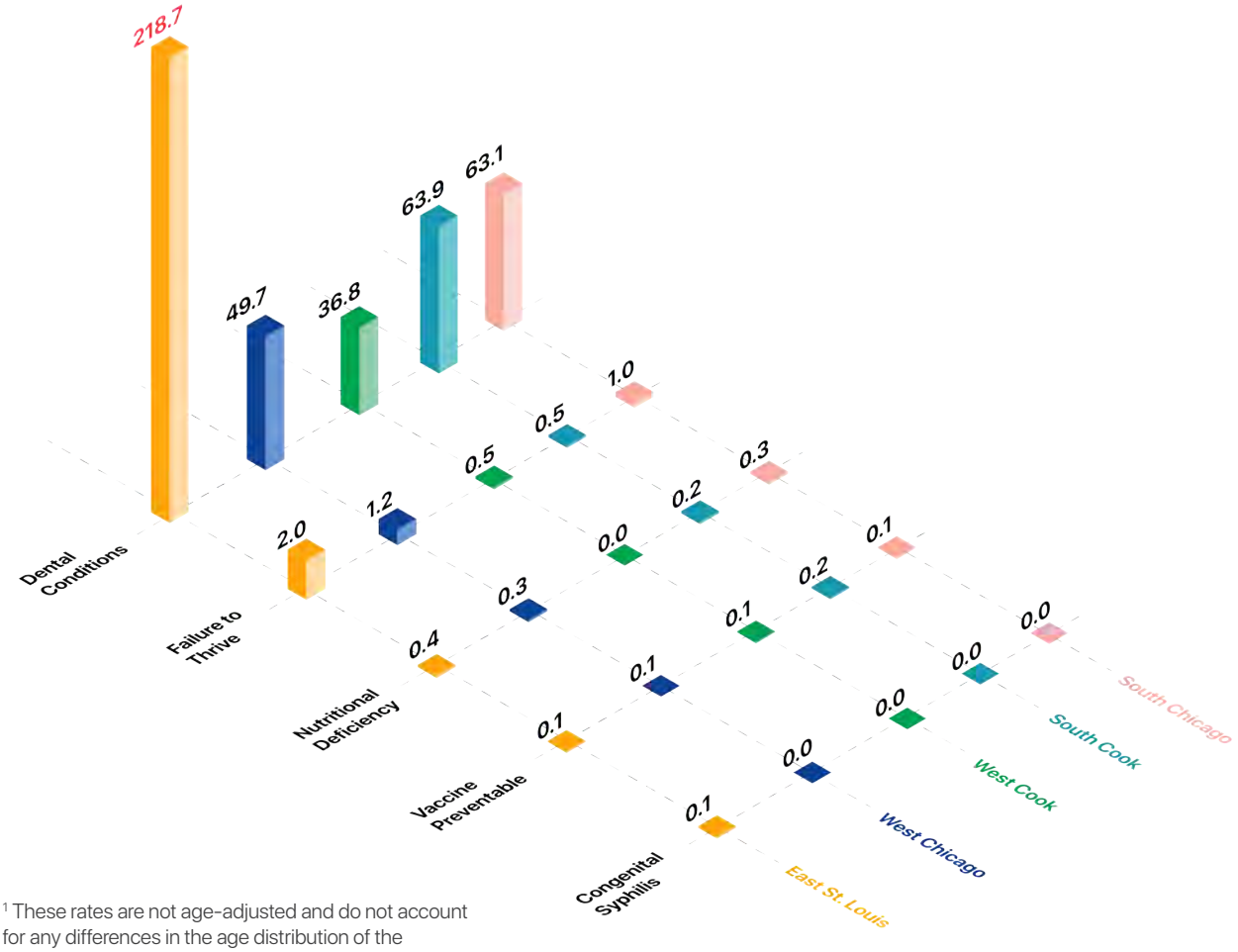
Table 16: Population Characteristics Associated with Chronic ACSC Patients

Chronic ACSCs		Confidence Interval			
	Odds Ratio	Lower Limit	Upper Limit	P-Value	Reference Groups
< 21 y	1.14	1.11	1.18	<.0001	vs. 22 to 34 y
35 to 44 y	1.56	1.51	1.61	<.0001	
45 to 64 y	2.39	2.33	2.45	<.0001	
≥65 y	1.77	1.71	1.83	<.0001	
Native Am.	1.33	1.10	1.60	0.003	vs. White
Asian/P.I.	0.73	0.66	0.81	<.0001	
Black	1.68	1.64	1.72	<.0001	
Other/Unknown	1.20	1.17	1.24	<.0001	
Male	1.52	1.49	1.55	<.0001	vs. Female
East St. Louis	1.28	1.15	1.44	<.0001	vs. West Cook
South Chicago	1.40	1.23	1.59	<.0001	
South Cook	1.21	1.08	1.35	0.0011	
West Chicago	1.36	1.16	1.59	0.0002	

Avoidable ACSC Key Findings

- Dental conditions are, by far, the top avoidable ACSC.
- When we look at the location of care behind these figures, dental conditions are the most frequent avoidable ACSC visit in the emergency department and the most frequent in terms of inpatient hospitalization (though the vast majority are ED encounters and not inpatient hospitalizations).
- The most frequent dental condition driving both ED visits and hospitalizations is periapical abscess without sinus, which is a collection of pus at the root of a tooth caused by an infection that has spread from a tooth to the surrounding tissue.
- The second most frequent dental condition is dental caries (tooth decay).
- ED visits and hospitalizations for avoidable ACSCs are associated with younger to middle-age, Black males.
- East St. Louis, South Cook, South Chicago, and West Chicago are particularly burdened by ED visits and inpatient hospitalizations for avoidable ACSCs.

Figure 34: Most Frequent Avoidable ACSCs Associated with ED Visits and Hospitalizations by Study Areas (Crude Rates per 10,000 Medicaid Enrollees[1])



[1] These rates are not age-adjusted and do not account for any differences in the age distribution of the Medicaid recipient population between study areas.

Table 17: Population Characteristics Associated with Avoidable ACSC Patients

Avoidable ACSCs		Confidence Interval			
	Odds Ratio	Lower Limit	Upper Limit	P-Value	Reference Groups
< 21 y	1.43	1.33	1.53	<.0001	vs. 45 to 64 y
21 to 34 y	2.90	2.73	3.07	<.0001	
35 to 44 y	2.38	2.23	2.55	<.0001	
≥65 y	0.31	0.26	0.36	<.0001	
Native Am.	1.18	0.78	1.78	0.43	vs. White
Asian/P.I.	0.54	0.39	0.73	<.0001	
Black	1.36	1.29	1.43	<.0001	
Other/Unknown	1.09	1.02	1.17	0.014	
Male	1.30	1.25	1.35	<.0001	vs. Female
East St. Louis	4.00	3.64	4.38	<.0001	vs. West Cook
South Chicago	1.21	1.10	1.33	<.0001	
South Cook	1.61	1.46	1.78	<.0001	
West Chicago	1.05	0.95	1.17	0.33	

Analysis Results: Preventive Quality Indicators
As a reminder, Preventive Quality Indicators are based on a subset of diagnoses for hospital admissions and contain 3 composite indicators and several disease-specific indicators:

- PQI 90 Composite combines hospitalizations diagnoses for both Acute and Chronic PQIs
- PQI 91 Acute is a composite indicator of acute, episodic hospitalization diagnoses; disease-specific Acute PQIs include the following:
  - -PQI 11 Bacterial Pneumonia Admission Rate
  - -PQI 12 Urinary Tract Infection Admission Rate
- PQI 92 Chronic is a composite indicator of chronic disease or condition hospitalizations; disease-specific Chronic PQIs include the following:
  - -Diabetes-Specific PQIs
    - PQI 93 Diabetes Hospitalization Composite (combined measure of 01, 03, and 14)
    - PQI 01 Diabetes, Short-Term Complications Admission Rate
    - PQI 03 Diabetes, 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 Admission Rate
  - -PQI 15 Asthma, Younger Adults (18–39) Admission Rate
  - -PQI 16 Rate of Lower Extremity Amputation among Patients with Diabetes

The following data analyses were completed for PQIs:

- age-segmented rates compared against national benchmarks, for both PQI composite scores and disease-specific PQIs
- associated population characteristics for both PQI composite scores and individual disease PQIs
- age-adjusted PQI rates compared against national benchmarks, for both PQI composite scores and individual disease PQIs

PQI rates were calculated for all of these measures except PQI 16, rate of lower extremity amputation among diabetics, PQI 10, dehydration, and the asthma/COPD PQIs (PQI 05 and 15). Calculation of PQI 16 rates requires secondary diagnoses codes in order to identify hospitalizations for this issue. The data set did not contain these so PQI 16 could not be calculated. The same is true for PQI 10, dehydration. (Note: PQI 93 typically contains PQI 16 but was left out of the calculations since PQI 16 care encounters could not be identified in the data). Per capita rates for PQI 05, COPD/Asthma in Older Adults, and PQI 15, Asthma in Younger Adults, could not be calculated because the size of Medicaid recipient subpopulations for ages 18–39 (required for PQI 15) and ages 40–64 (required for PQI 05) could not be determined from publicly available sources (data needed for the denominator). However, population characteristic associations were calculated for these PQIs.

Finally, rates were calculated for PQI 07-Hypertension. However, unlike all other rates, rates for this PQI were found to be lower than national rate, an implausible finding given that hypertensive diseases are prevalent in the communities under study. We believe that this counterintuitive finding is due to the fact that this particular PQI contains only a small subset of hypertensive diseases, a restriction that may have introduce bias into the comparisons between our study areas and national rates. As such, we chose to exclude PQI 07 analyses from this report.

To compute PQIs, only inpatient hospitalization data is used. It's also important to note that the same approach used to calculate associated population characteristics for mental illness and substance use disorders was used to determine population characteristics associated with PQIs.

Summaries of the analyses of age-segmented and age-adjusted PQI rates compared against national benchmarks as well as population characteristics associated with PQIs follow. Figures 35–47 and Tables 18–29 show the specific results of the analyses.

(Note: In the analyses that follow, Medicaid enrollee PQI rates are being compared against national PQIs rates which are made up discharge data from the general population. These benchmarks are being used to gauge, directionally, the state of the healthcare ecosystem in each of these study areas. 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, state-wide and by insurance status. See the "Data Limitations and Opportunities for Future Research" section for more information.)

Composite PQI Findings: PQI 90 Overall, PQI 91 Acute, PQI 92 Chronic

- For all 3 composite PQIs (90, 91, and 92), all areas under study have higher rates for ACSCs in comparison to national benchmarks.
- Middle-age to senior Black men are most associated with overall and chronic ACSC hospitalizations (PQI 90 and 9s).
- Black men ages 18 to 39 and age 75+ are most associated with acute ACSC hospitalizations (PQI 91).
- Geographically, East St. Louis is particularly burdened with acute ACSC hospitalizations.

Figure 35: PQI 90 (Overall ACSC Composite) Hospital Admission Rates per 100,000 Medicaid Recipients by Study Area with National Benchmarks for the General Population as Reference

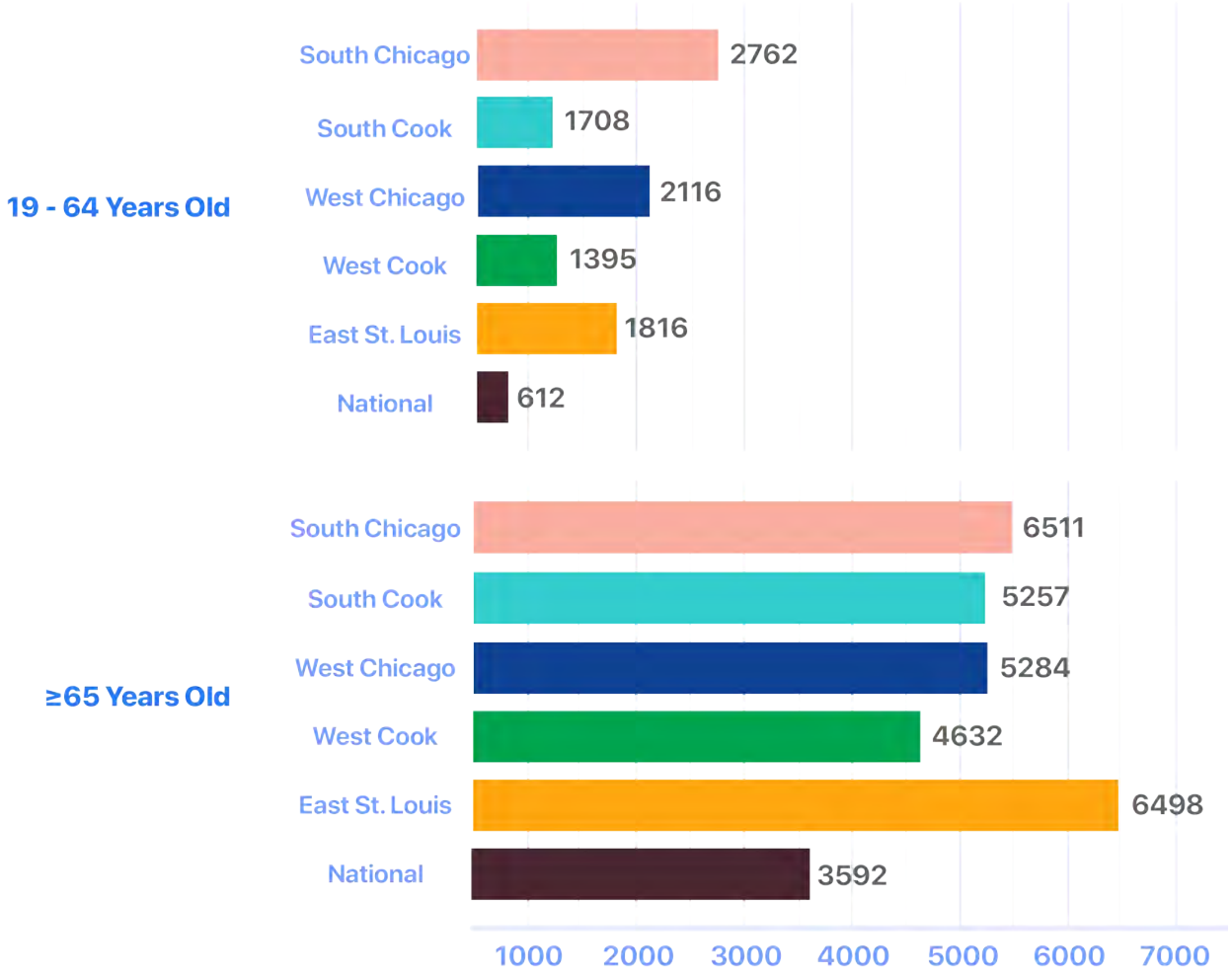


Table 18: Population Characteristics Associated with PQI 90, Overall ACSC Composite

PQI 90		Confidence Interval			
	Odds Ratio	Lower Limit	Upper Limit	P-Value	Reference Groups
40 to 64y	1.94	1.91	1.97	<.0001	vs. under 40 y
65 to 74y	2.28	2.23	2.34	<.0001	
75y or older	2.90	2.82	2.98	<.0001	
Native Am.	1.04	0.89	1.21	0.63	vs. White
Asian/P.I.	0.76	0.71	0.81	<.0001	
Black	1.37	1.34	1.40	<.0001	
Other/Unknown	0.99	0.96	1.01	0.35	
Male	1.10	1.08	1.11	<.0001	vs. Female
East St. Louis	1.31	1.21	1.42	<.0001	vs. West Cook
South Chicago	1.07	0.98	1.17	0.11	
South Cook	1.05	0.98	1.14	0.18	
West Chicago	1.07	0.96	1.19	0.24	

Figure 36: PQI 91 (Acute ACSC Composite) Hospital Admission Rates per 100,000 Medicaid Recipients by Study Area with National Benchmarks for the General Population as Reference

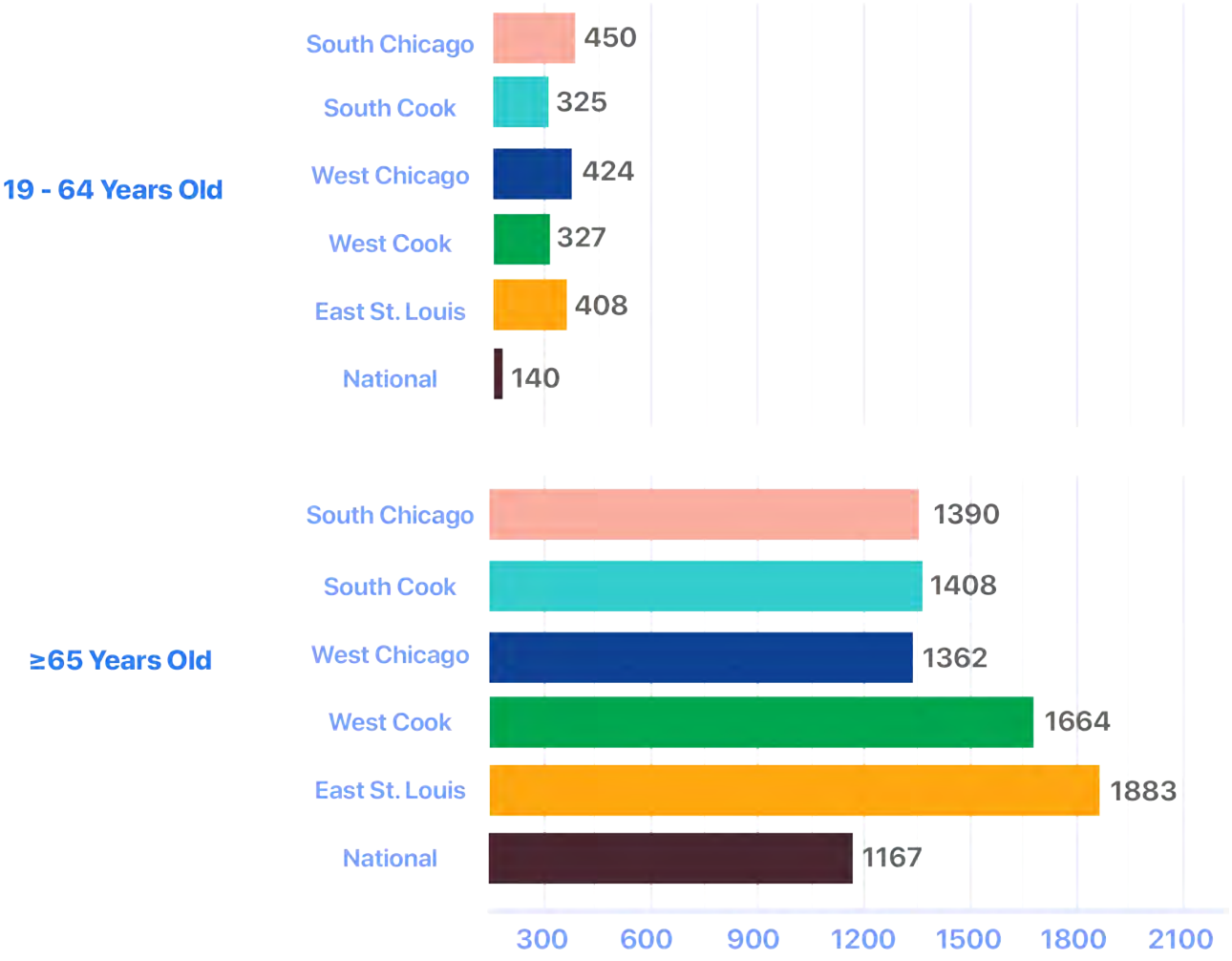


Table 19: Population Characteristics Associated with PQI 91, ACSC Acute Composite

PQI 91		Confidence Interval			
	Odds Ratio	Lower Limit	Upper Limit	P-Value	Reference Groups
18 to 39y	1.19	1.16	1.22	<.0001	vs. 40 to 64 y
65 to 74y	0.86	0.82	0.91	<.0001	
75y or older	1.40	1.33	1.48	<.0001	
Native Am.	0.75	0.56	1.01	0.05	vs. White
Asian/P.I.	0.75	0.66	0.85	<.0001	
Black	1.05	1.02	1.09	0.00	
Other/Unknown	0.95	0.91	1.00	0.04	
Male	1.95	1.89	2.01	<.0001	vs. Female
East St. Louis	1.70	1.56	1.85	<.0001	vs. West Cook
South Chicago	0.97	0.88	1.06	0.47	
South Cook	1.23	1.13	1.34	<.0001	
West Chicago	0.98	0.88	1.09	0.69	

Figure 37: PQI 92 (Chronic ACSC Composite) Hospital Admission Rates per 100,000 Medicaid Recipients by Study Area with National Benchmarks for the General Population as Reference

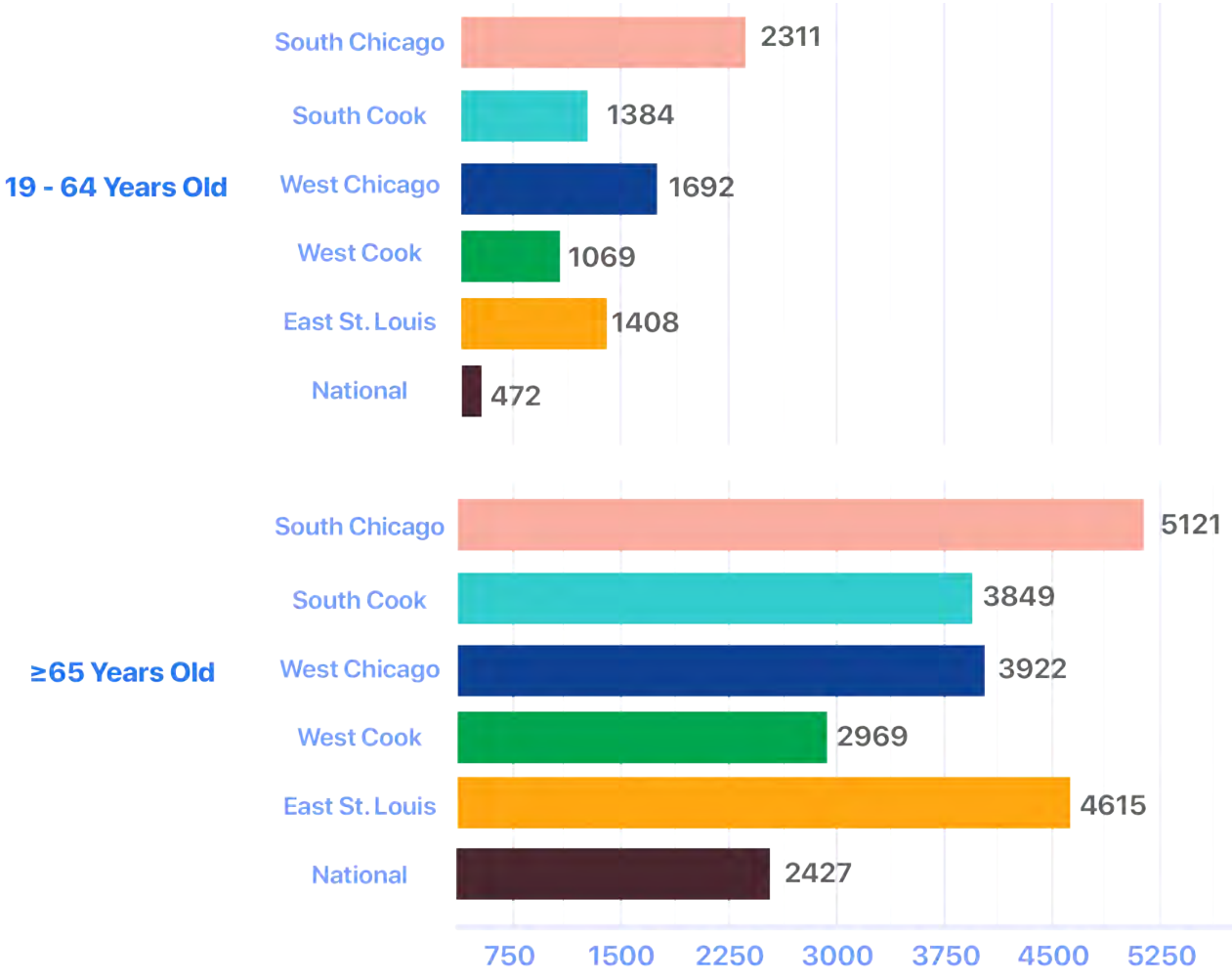


Table 20: Population Characteristics Associated with PQI 92, ACSC Chronic Composite

PQI 92		Confidence Interval			
	Odds Ratio	Lower Limit	Upper Limit	P-Value	Reference Groups
40 to 64y	2.92	2.86	2.98	<.0001	vs. under 40 y
65 to 74y	3.69	3.59	3.80	<.0001	
75y or older	4.43	4.29	4.57	<.0001	
Native Am.	1.20	1.01	1.43	0.04	vs. White
Asian/P.I.	0.78	0.72	0.84	<.0001	
Black	1.52	1.48	1.55	<.0001	
Other/Unknown	1.01	0.98	1.05	0.44	
Male	1.41	1.38	1.43	<.0001	vs. Female
East St. Louis	1.11	1.00	1.24	0.06	vs. West Cook
South Chicago	1.10	0.97	1.24	0.14	
South Cook	0.99	0.89	1.10	0.82	
West Chicago	1.09	0.94	1.27	0.25	

Diabetes-Specific PQIs: PQI 93 Overall, PQI 01 Short-Term Complication Admissions, PQI 03 Long-Term Complication Admissions, PQI 14 Uncontrolled Diabetes Admissions

- For all 4 diabetes-specific PQIs (93, 01, 02, and 14), the areas under study have higher rates for all types of diabetes hospitalizations in comparison to national benchmarks.
- PQI 93, Diabetes Hospitalization Overall Composite: middle-age to senior Black men are most associated with ACSCs hospitalizations that make up this measure.
- PQI 01, Diabetes, Short-Term Complications: Black and Asian men, ages 18 to 39, are most associated with hospitalizations that make up this measure; in addition, East St. Louis Metro, South Cook, and South Chicago are particularly burdened by hospitalizations for short-term diabetes complications.
- PQI 03, Diabetes, Long-Term Complications: middle-age to senior men are most associated with hospitalizations for long-term diabetes complications.
- PQI 14, Uncontrolled Diabetes: middle-age to senior Black men are most associated with hospitalizations for uncontrolled diabetes.

Figure 38: PQI 93 (Diabetes Hospitalization Composite) Hospital Admission Rates per 100,000 Medicaid Recipients by Study Area with National Benchmarks for the General Population as Reference

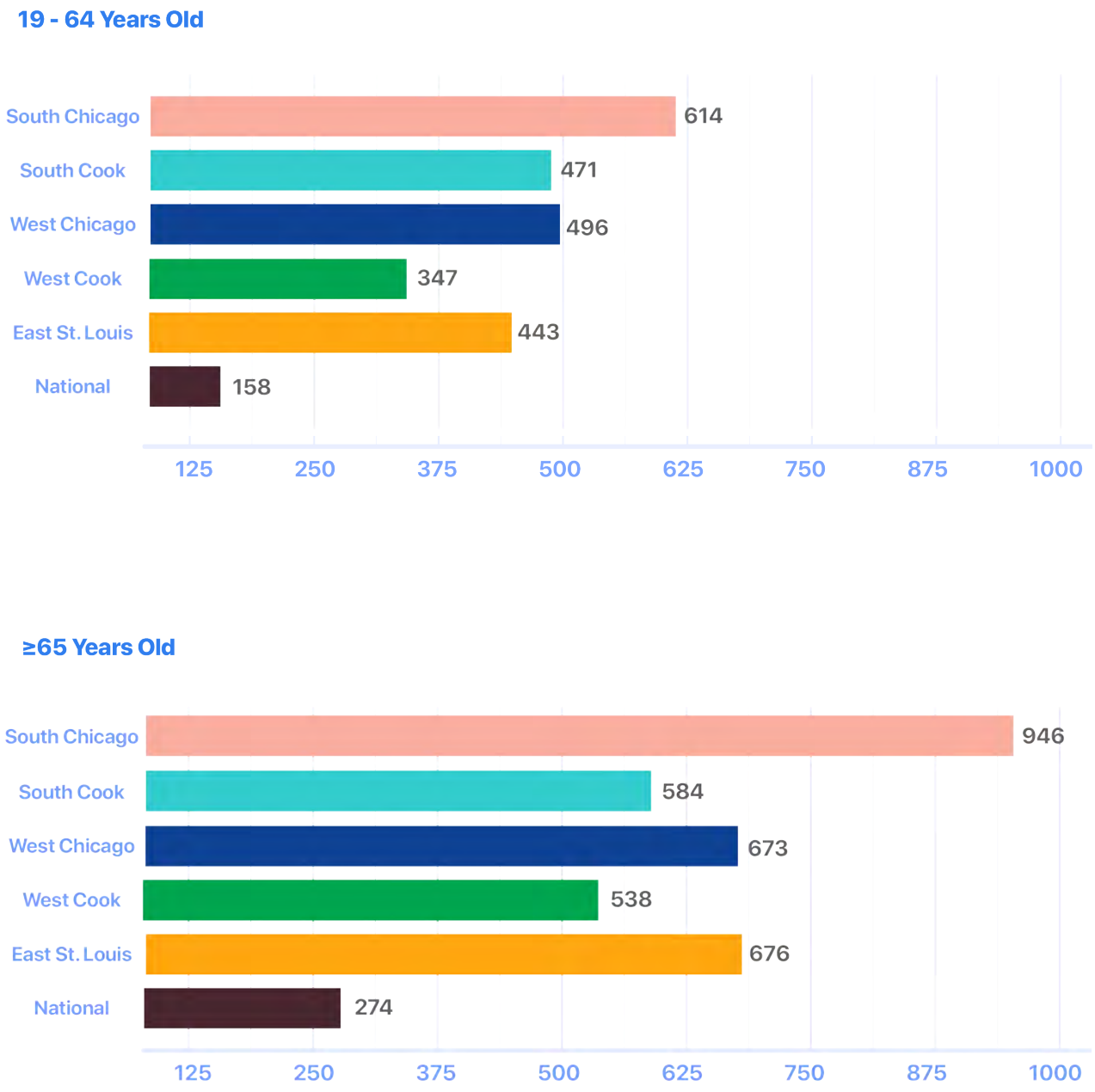


Table 21: Population Characteristics Associated with PQI 93, Diabetes Hospitalization Composite

PQI 93		Confidence Interval			
	Odds Ratio	Lower Limit	Upper Limit	P-Value	Reference Groups
40 to 64y	2.30	2.22	2.38	<.0001	vs. under 40 y
65 to 74y	2.80	2.66	2.95	<.0001	
75y or older	2.97	2.80	3.16	<.0001	
Native Am.	0.86	0.61	1.19	0.36	vs. White
Asian/P.I.	0.82	0.72	0.93	0.00	
Black	1.04	1.00	1.09	0.05	
Other/Unknown	0.94	0.89	0.99	0.02	
Male	1.74	1.68	1.79	<.0001	vs. Female
East St. Louis	1.03	0.82	1.28	0.81	vs. West Cook
South Chicago	0.91	0.70	1.17	0.46	
South Cook	0.88	0.71	1.09	0.25	
West Chicago	0.95	0.70	1.30	0.76	

Figure 39: PQI 01 (Diabetes Short-Term Complications) Hospital Admission Rates per 100,000 Medicaid Recipients by Study Area with National Benchmarks for the General Population as Reference

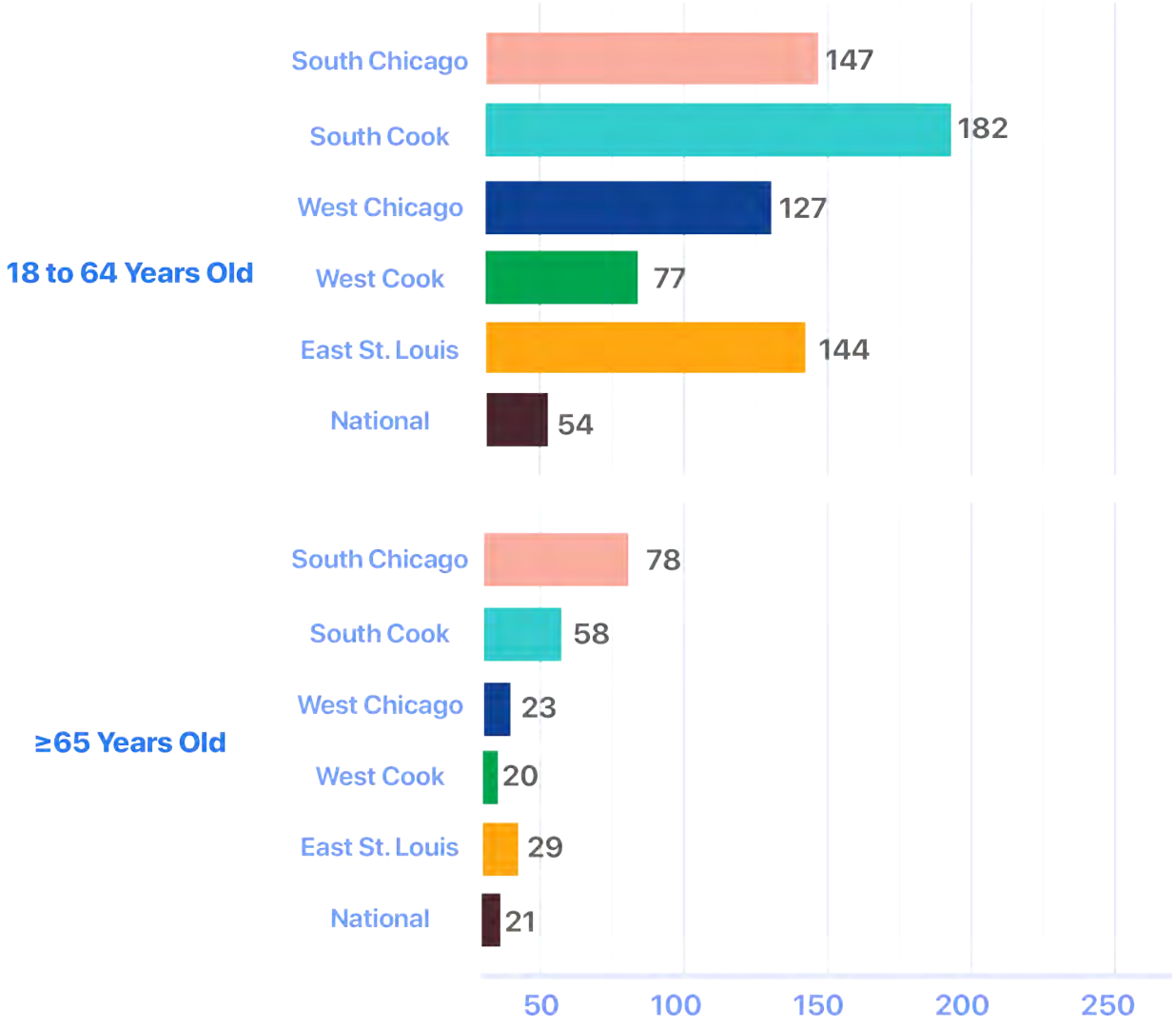


Table 22: Population Characteristics Associated with PQI 01, Diabetes Short-Term Complications

PQI 01		Confidence Interval			
	Odds Ratio	Lower Limit	Upper Limit	P-Value	Reference Groups
18 to 39y	3.16	2.82	3.54	<.0001	vs. 40 to 64 y
65 to 74y	0.48	0.34	0.69	<.0001	
75y or older	0.55	0.36	0.84	0.01	
Native Am.	Ignore: too few in category to analyze				vs. White
Asian/P.I.	1.52	1.03	2.25	0.04	
Black	1.20	1.07	1.35	0.00	
Other/Unknown	0.74	0.61	0.91	0.00	
Male	2.41	2.18	2.66	<.0001	vs. Female
East St. Louis	1.48	1.17	1.89	0.00	vs. West Cook
South Chicago	1.48	1.19	1.83	0.00	
South Cook	1.63	1.29	2.04	<.0001	
West Chicago	1.23	0.98	1.55	0.08	

Figure 40: PQI 03 (Diabetes Long-Term Complications) Hospital Admission Rates per 100,000 Medicaid Recipients by Study Area with National Benchmarks for the General Population as Reference

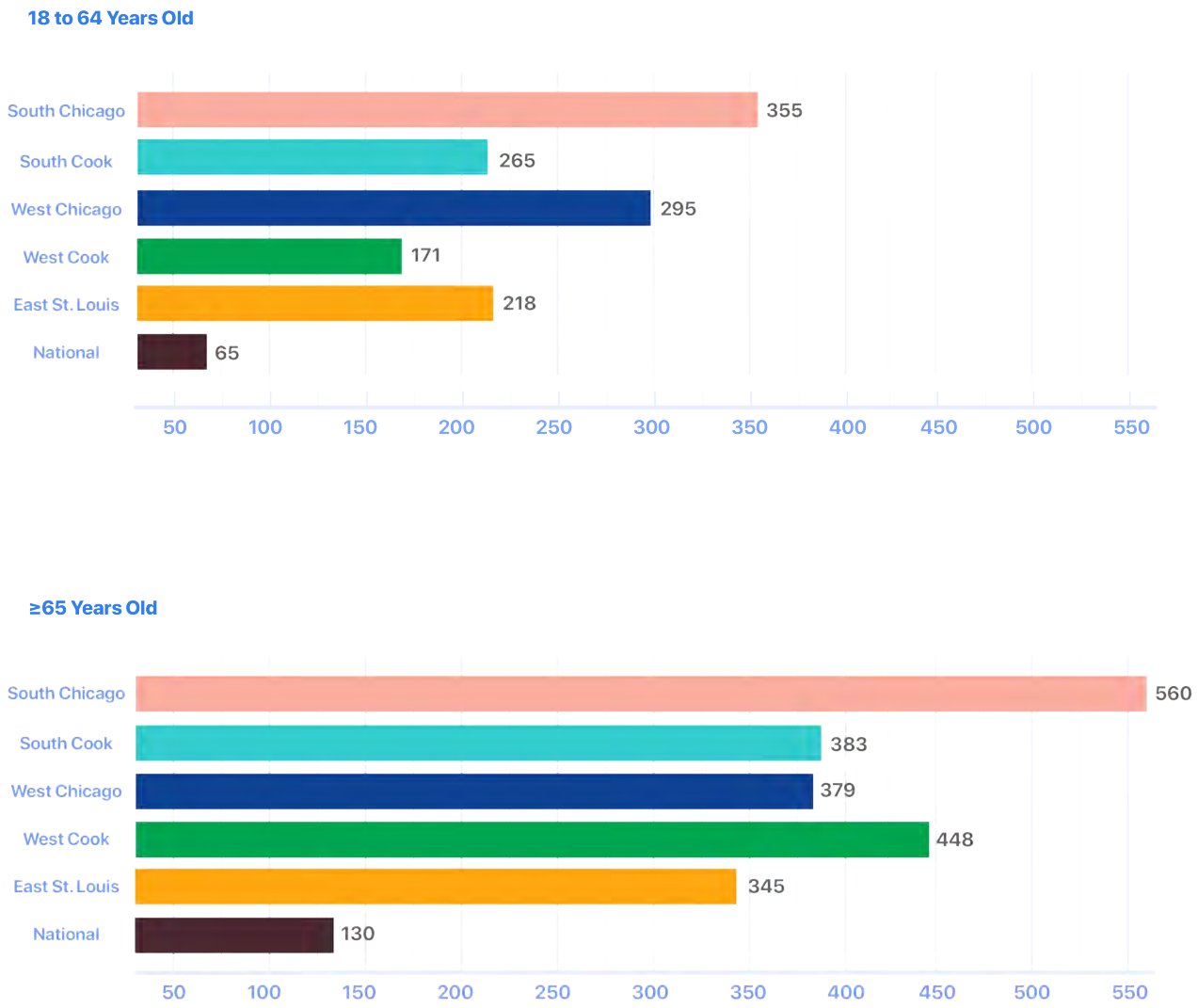


Table 23: Population Characteristics Associated with PQI 03, Diabetes Long-Term Complications

PQI 03		Confidence Interval			
	Odds Ratio	Lower Limit	Upper Limit	P-Value	Reference Groups
40 to 64y	4.02	3.81	4.25	<.0001	vs. under 40 y
65 to 74y	5.16	4.81	5.54	<.0001	
75y or older	5.19	4.78	5.62	<.0001	
Native Am.	0.83	0.55	1.27	0.40	vs. White
Asian/P.I.	0.69	0.58	0.82	<.0001	
Black	0.94	0.89	0.99	0.02	
Other/Unknown	0.91	0.85	0.97	0.01	
Male	1.79	1.72	1.85	<.0001	vs. Female
East St. Louis	0.92	0.68	1.25	0.60	vs. West Cook
South Chicago	0.81	0.57	1.16	0.25	
South Cook	0.74	0.54	1.00	0.05	
West Chicago	0.94	0.61	1.45	0.79	

Figure 41: PQI 14 (Diabetes Uncontrolled Complications) Hospital Admission Rates per 100,000 Medicaid Recipients by Study Area with National Benchmarks for the General Population as Reference

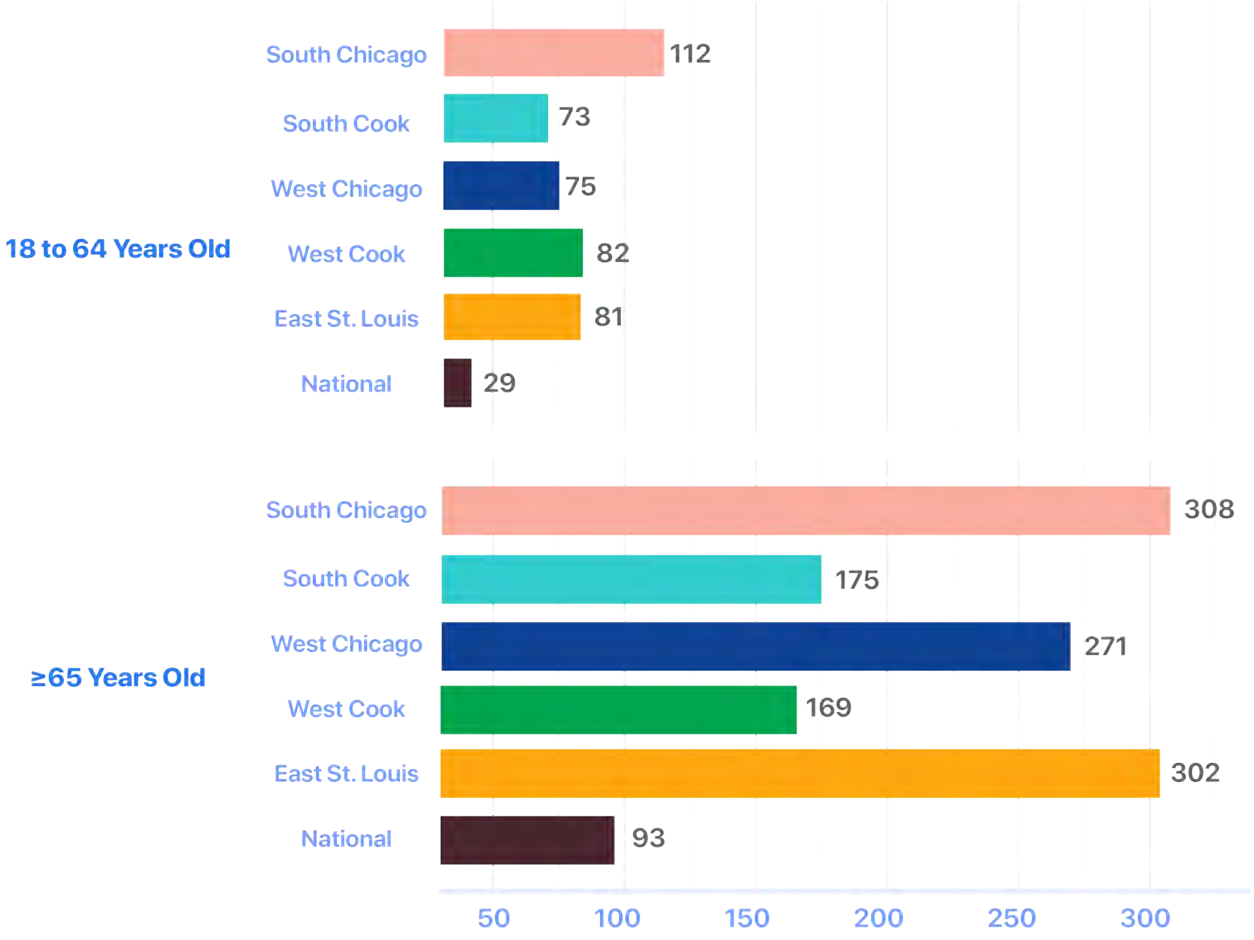


Table 24: Population Characteristics Associated with PQI 14, Diabetes Uncontrolled Complications

PQI 14		Confidence Interval			
	Odds Ratio	Lower Limit	Upper Limit	P-Value	Reference Groups
40 to 64y	1.90	1.79	2.02	<.0001	vs. under 40 y
65 to 74y	2.17	1.98	2.38	<.0001	
75y or older	2.55	2.30	2.83	<.0001	
Native Am.	1.25	0.74	2.13	0.40	vs. White
Asian/P.I.	0.90	0.72	1.13	0.37	
Black	1.31	1.23	1.40	<.0001	
Other/Unknown	1.11	1.01	1.22	0.04	
Male	1.48	1.41	1.56	<.0001	vs. Female
East St. Louis	1.06	0.95	1.19	0.30	vs. West Cook
South Chicago	1.07	0.97	1.18	0.19	
South Cook	1.09	0.98	1.21	0.13	
West Chicago	0.93	0.84	1.04	0.20	

PQI 08 Congestive Heart Failure (CHF)

- All areas under study have higher rates for CHF hospitalizations in comparison to national benchmarks.
- Middle-age to senior Black adults are most associated with ACSCs hospitalizations that comprise this measure.
- South Cook and South Chicago are particularly burdened by hospitalizations for congestive heart failure.

Figure 42: PQI 08 (Congestive Heart Failure Hospitalizations) Hospital Admission Rates per 100,000 Medicaid Recipients by Study Area with National Benchmarks for the General Population as Reference

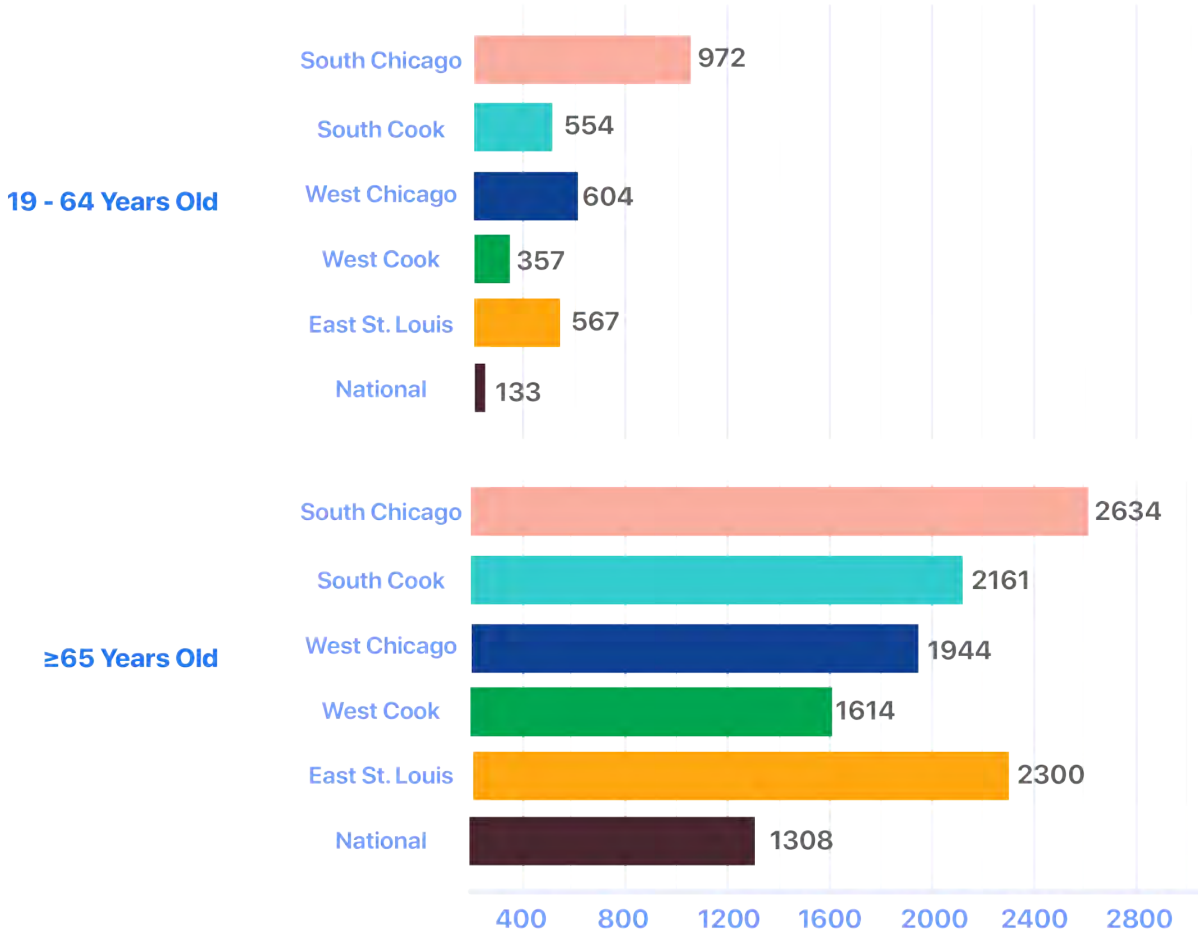


Table 25: Population Characteristics Associated with PQI 08, Congestive Heart Failure

PQI 08		Confidence Interval			
	Odds Ratio	Lower Limit	Upper Limit	P-Value	Reference Groups
40 to 64y	5.90	5.56	6.27	<.0001	vs. under 40 y
65 to 74y	8.90	8.29	9.55	<.0001	
75y or older	12.3	11.5	13.3	<.0001	
Native Am.	0.88	0.53	1.47	0.63	vs. White
Asian/P.I.	0.78	0.66	0.93	0.01	
Black	1.86	1.76	1.96	<.0001	
Other/Unknown	1.15	1.07	1.23	0.00	
Male	1.65	1.59	1.71	<.0001	vs. Female
East St. Louis	0.96	0.82	1.12	0.56	vs. West Cook
South Chicago	1.35	1.16	1.58	0.00	
South Cook	1.30	1.12	1.50	0.00	
West Chicago	1.03	0.85	1.24	0.77	

PQI 11 Bacterial Pneumonia

- All areas under study have higher rates for bacterial pneumonia hospitalizations in comparison to national benchmarks.
- Middle-age to senior men are most associated with ACSCs hospitalizations that make up this measure. Rates are particularly high for senior men suggesting a possible role for pneumococcal vaccine as a prevention strategy.
- East St. Louis and South Cook are particularly burdened by hospitalizations for bacterial pneumonia.

Figure 43: PQI 11 (Bacterial Pneumonia Hospitalizations) Hospital Admission Rates per 100,000 Medicaid Recipients by Study Area with National Benchmarks for the General Population as Reference

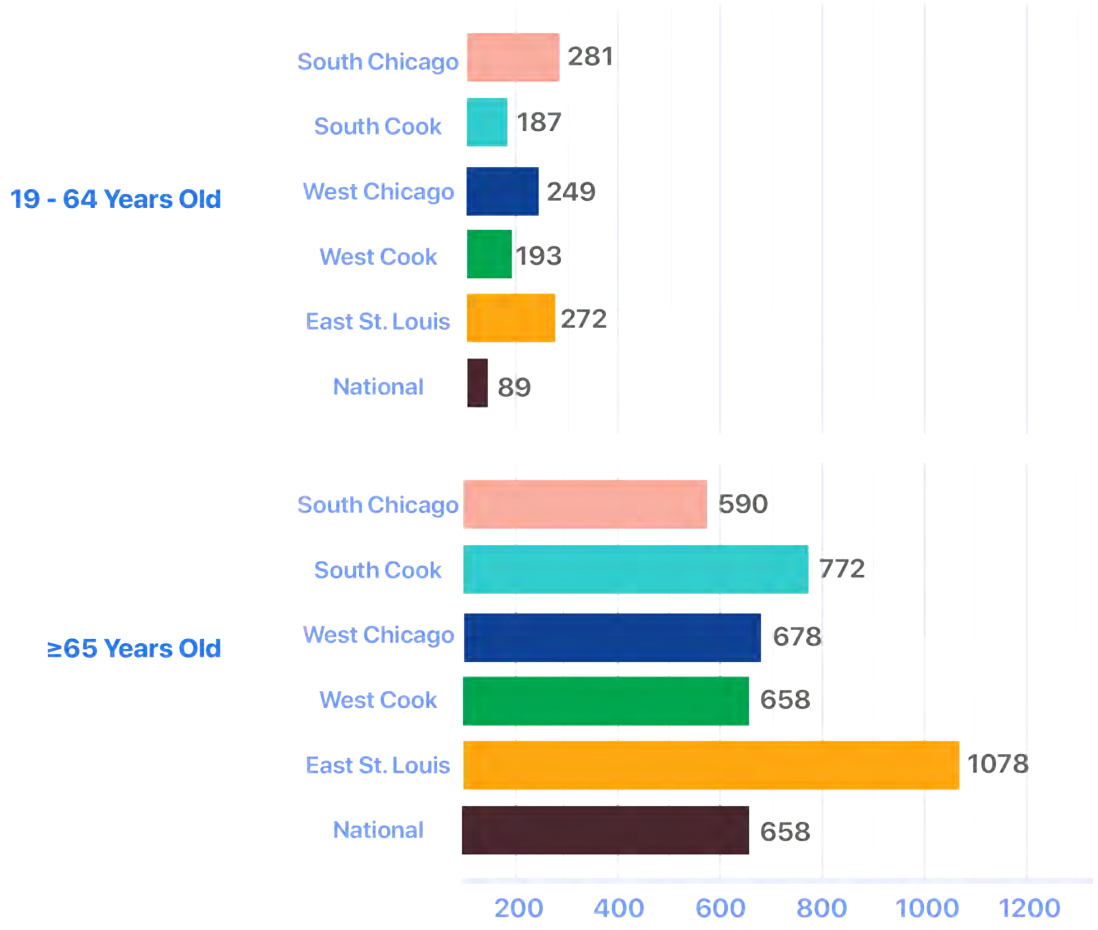


Table 26: Population Characteristics Associated with PQI 11, Bacterial Pneumonia

PQI 11		Confidence Interval			
	Odds Ratio	Lower Limit	Upper Limit	P-Value	Reference Groups
40 to 64y	2.16	2.04	2.29	<.0001	vs. under 40 y
65 to 74y	1.96	1.78	2.16	<.0001	
75y or older	2.91	2.64	3.21	<.0001	
Native Am.	1.15	0.71	1.86	0.56	vs. White
Asian/P.I.	0.88	0.72	1.09	0.25	
Black	1.03	0.97	1.09	0.34	
Other/Unknown	0.93	0.85	1.02	0.12	
Male	1.36	1.30	1.43	<.0001	vs. Female
East St. Louis	1.61	1.45	1.78	<.0001	vs. West Cook
South Chicago	0.94	0.86	1.04	0.21	
South Cook	1.17	1.06	1.30	0.00	
West Chicago	1.07	0.96	1.18	0.21	

PQI 12 Urinary Tract Infection (UTI)

- All areas under study have higher rates for UTI hospitalizations in comparison to national benchmarks.
- Women ages 18 to 39 and 75+ are most associated with UTI hospitalizations.
- East St. Louis Metro and South Cook are particularly burdened by these hospitalizations.

Figure 44: PQI 12 (Urinary Tract Infection Hospitalizations) Hospital Admission Rates per 100,000 Medicaid Recipients by Study Area with National Benchmarks for the General Population as Reference

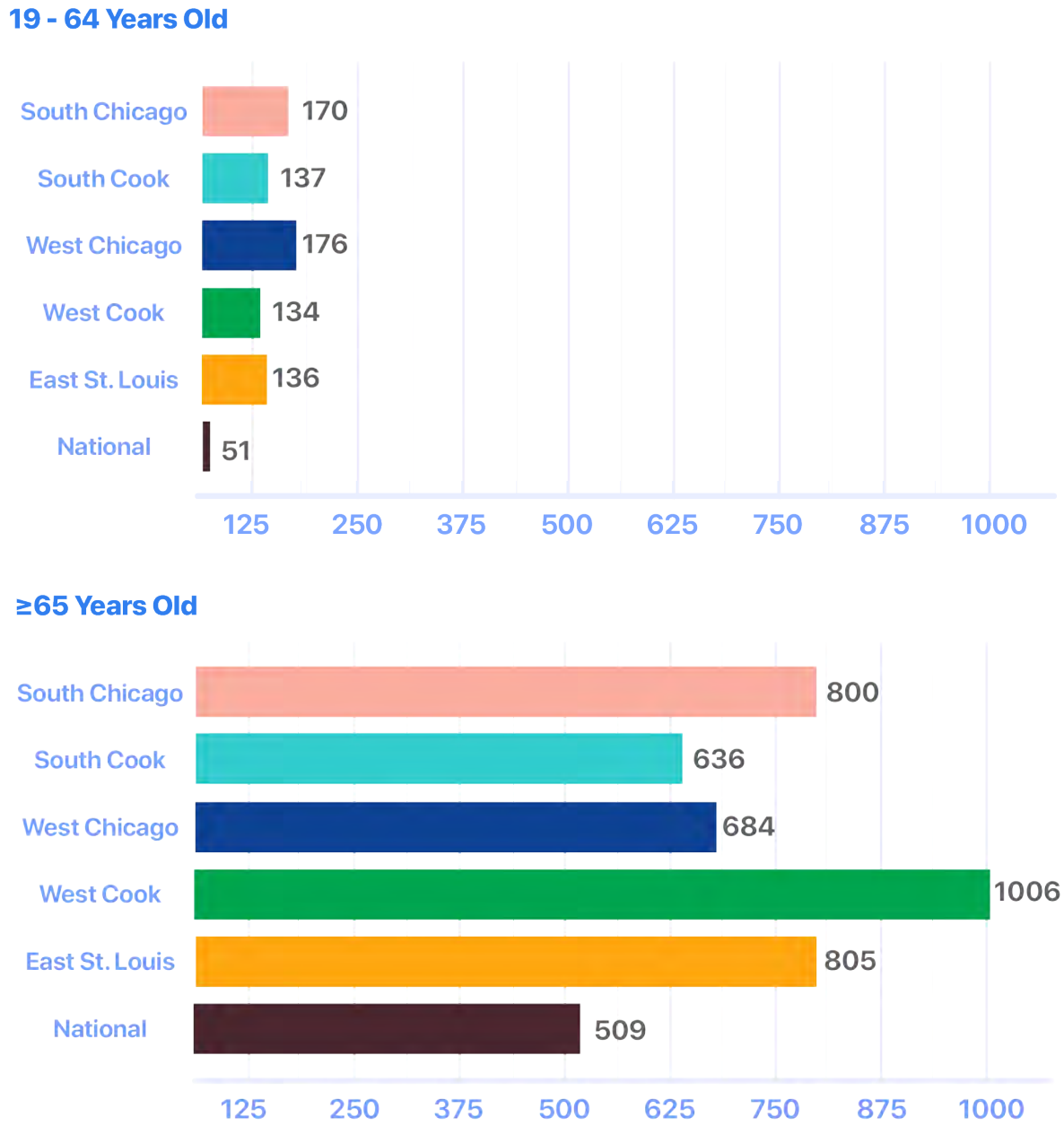


Table 27: Population Characteristics Associated with PQI 12, Urinary Tract Infection

PQI 12		Confidence Interval			
	Odds Ratio	Lower Limit	Upper Limit	P-Value	Reference Groups
18 to 39y	1.59	1.54	1.64	<.0001	vs. 40 to 64 y
65 to 74y	0.84	0.79	0.90	<.0001	
75y or older	1.45	1.36	1.55	0.00	
Native Am.	0.62	0.43	0.91	0.01	vs. White
Asian/P.I.	0.68	0.59	0.79	<.0001	
Black	1.08	1.04	1.12	0.00	
Other/Unknown	0.96	0.91	1.02	0.16	
Female	3.21	3.08	3.34	<.0001	vs. Male
East St. Louis	1.69	1.53	1.87	<.0001	vs. West Cook
South Chicago	0.96	0.86	1.07	0.46	
South Cook	1.23	1.12	1.36	<.0001	
West Chicago	0.94	0.83	1.06	0.30	

PQI 05 COPD/Asthma in Older Adults (40 and older)

- Black and Native American females ages 40 to 64 are most associated with hospitalizations for COPD/asthma.
- East St. Louis Metro, South Chicago, and West Chicago are particularly burdened by these hospitalizations for this age group.

Note: Per capita rates for PQI 05 could not be calculated because the size of Medicaid recipient subpopulations for ages 40 and above could not be determined from publicly available sources (data needed for the denominator).

Table 28: Population Characteristics Associated with PQI 05, COPD/Asthma in Older Adults (Over 40 Years Old)

PQI 05		Confidence Interval			
	Odds Ratio	Lower Limit	Upper Limit	P-Value	Reference Groups
65 to 74y	0.90	0.86	0.94	<.0001	vs. 40 to 64 y
75y or older	0.76	0.71	0.80	<.0002	
Native Am.	1.71	1.29	2.28	0.0002	vs. White
Asian/P.I.	0.68	0.57	0.80	<.0001	
Black	1.52	1.45	1.59	<.0001	
Other/Unknown	0.86	0.81	0.92	<.0001	
Female	1.08	1.05	1.11	<.0001	vs. Male
East St. Louis	1.66	1.37	2.00	<.0001	vs. West Cook
South Chicago	1.47	1.18	1.81	0.0005	
South Cook	1.09	0.90	1.31	0.39	
West Chicago	1.62	1.25	2.09	0.0003	

PQI 15 Asthma in Younger Adults (18 to 39 Years Old)

- Black and Native American females are most associated with hospitalizations for asthma.
- There are no geographic areas that are specifically associated with this PQI.

Note: Per capita rates for PQI 05 could not be calculated because the size of Medicaid recipient subpopulations for ages 18 to 39 could not be determined from publicly available sources (data needed for the denominator).

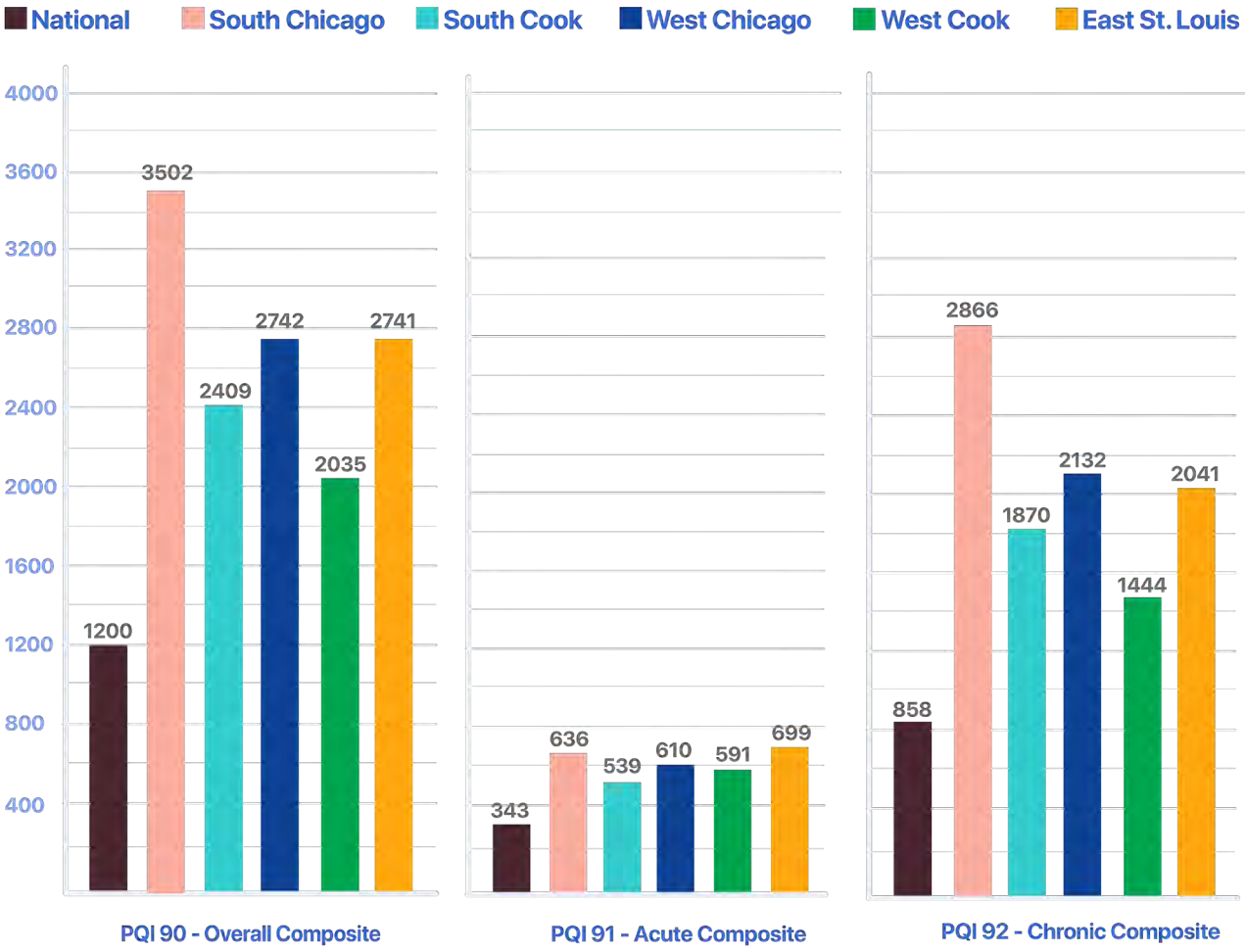
Table 29: Population Characteristics Associated with PQI 15, Asthma in Younger Adults (18 to 39 Years Old)

PQI 15		Confidence Interval			
	Odds Ratio	Lower Limit	Upper Limit	P-Value	Reference Groups
Native Am.	1.69	1.04	2.74	0.034	vs. White
Asian/P.I.	0.53	0.34	0.84	0.006	
Black	2.25	2.08	2.44	<.0001	
Other/Unknown	1.28	1.15	1.42	<.0001	
Female	1.75	1.66	1.84	<.0001	vs. Male
East St. Louis	0.80	0.63	1.01	0.059	vs. West Cook
South Chicago	0.86	0.67	1.10	0.23	
South Cook	0.85	0.67	1.06	0.15	
West Chicago	1.00	0.74	1.35	0.99	

Age-Adjusted PQI Rates

Given that many ambulatory care sensitive conditions are diseases that more commonly impact older populations, age-adjusted PQI rates were computed. Results of these analyses show that, even when adjusting for age, study area rates for key PQIs are higher than the national benchmarks, in particular in South Chicago.

Figure 45: Age-Adjusted[1] Hospital Admission Rates per 100,000 Medicaid Recipients by Study Area with National Benchmarks for the General Population as Reference for Composite PQIs (90, 91, and 92)



[1]These rates take into account differences in the age distribution of the Medicaid recipient population between study areas and as well as the national benchmark population.

Figure 46: Age-Adjusted[1] Hospital Admission Rates per 100,000 Medicaid Recipients by Study Area with National Benchmarks for the General Population as Reference for Diabetes-Related PQIs (93, 01, 03, and 14)

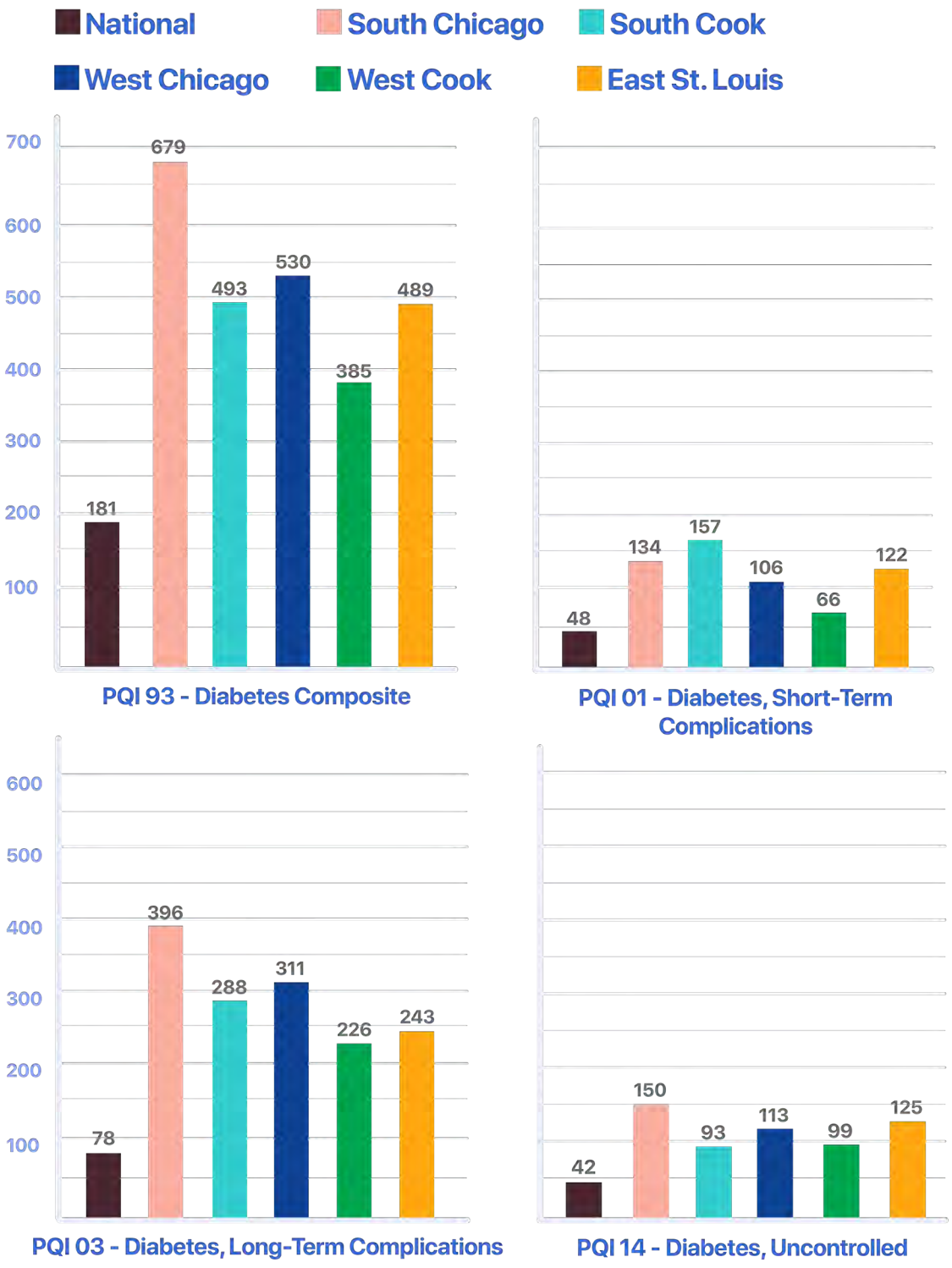
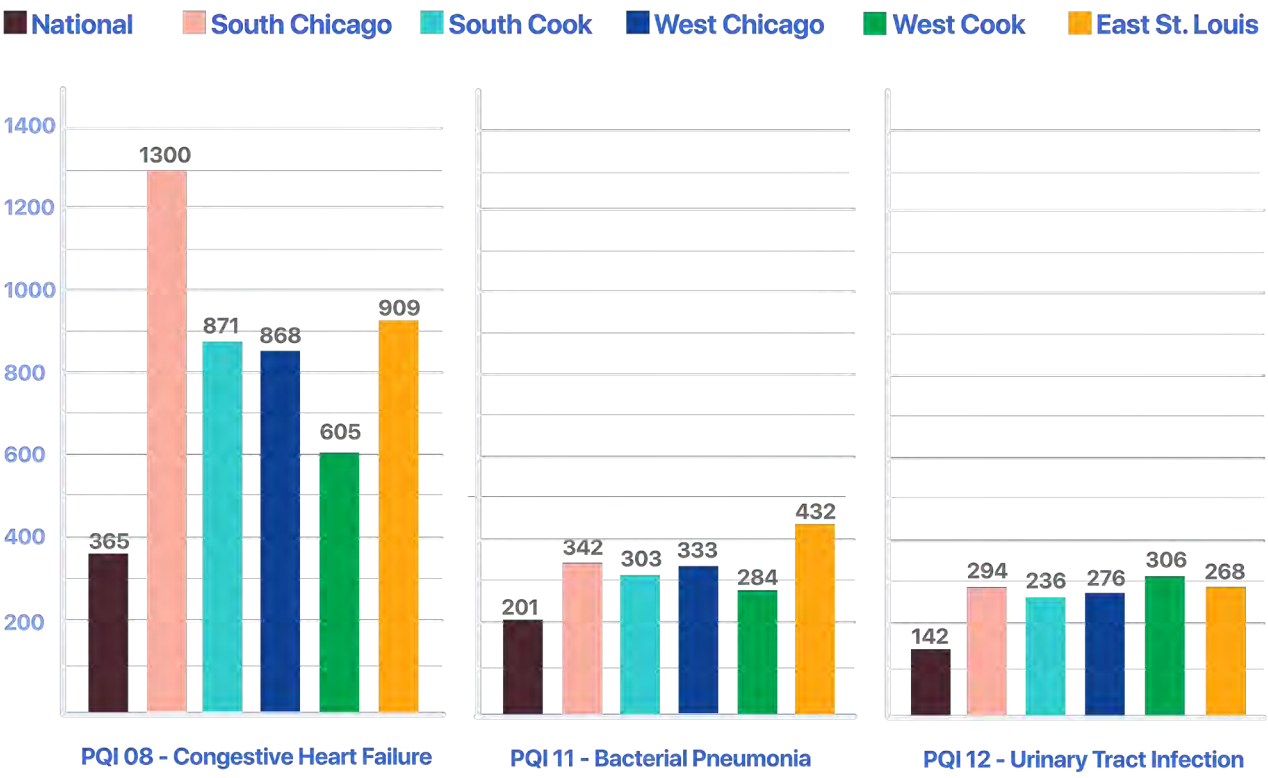


Figure 47: Age-Adjusted1 Hospital Admission Rates per 100,000 Medicaid Recipients by Study Area with National Benchmarks for the General Population as Reference for Other Disease-Specific PQIs (08-Congestive Heart Failure, 11-Bacterial Pneumonia, 12-UTI)



From Community Input: Conditions and Barriers Specific to Diet-Related ACSCs

In community input sessions, residents described specific barriers related to preventing and managing diet-related ACSCs. Barriers specific to preventing and getting treatment for diet-related diseases such as diabetes, hypertension and heart disease included lack of access to healthy food, difficulty changing lifestyle habits, hesitancy to seek care, and affordability of care and treatment.

Lack of access to healthy food: Prevention and care for diet-related diseases require accessing and preparing healthy food, and residents faced multiple barriers related to these objectives, including lack of local full-service grocery stores, lack of transportation to get to full-service grocery stores, high cost of healthy foods, and lack of time, as well as pervasive access to low-cost fast food and pre-packaged meals high in sodium and fat.

Difficulty changing lifestyle habits: Many community members described a family history of diabetes and hypertension and recognized that food traditions high in fat, cholesterol, sugar, and sodium are passed down in the family. These ingrained food habits are difficult to change. Residents requested practical recommendations on how lead a healthy lifestyle, culturally

relevant nutrition education, and affordable access to fitness centers when outdoor recreation isn't possible due to lack of sidewalk infrastructure or concerns about street violence.

Hesitancy to seek care: Residents told stories of deaths of neighbors and loved ones due to delays in seeking care for diabetes, hypertension, and heart issues. Distrust of the healthcare system, negative previous experiences with care, an "ignorance is bliss" mindset, and lack of knowledge of signs and symptoms were all described as contributing to avoidance of care or going to the ED when necessary.

Affordability of treatment over time: Residents described the costs associated with managing a diet-related chronic condition to be ongoing and burdensome especially when insurance doesn't cover key services and devices. Uninsured or underinsured residents with diabetes, for example, described out-of-pocket costs associated with specialist appointments, medicine, test strips, and dialysis to be significant barriers to managing their disease. Ongoing costs associated with hypertension include access to a blood pressure monitor, medicine, and routine visits with a provider.

In general, residents expressed the need for practical information and solutions to make healthy habits fit their lives. Several participants of South Cook proposed a community-based diabetes center that would focus on supporting community members in managing their diabetes through relationship-based care and onsite nutrition education, healthy grocery shopping, cooking classes, and exercise classes.

Appendix C:
Approach to Resource Gap Analysis

The resource gap analysis examined professional healthcare shortages and food deserts across study areas as well as rates of behavioral health facilities accessibility within study areas compared to rates of hospital-level care for mental illnesses and substance use disorders.

Maps of primary care and mental health professional shortage areas were derived from existing data sets from the Health Resources and Services Administration (HRSA). Specifically, primary care and mental health shortage areas data were obtained from the Health & Resources Services Administrations' Health Professional Shortage Areas (HPSAs), Medically Underserved and Health Professional Shortage Area Data, https://bhw.hrsa.gov/shortage-designation/hpsas (accessed August 19, 2020).

Maps of food deserts were derived from existing data from the United States Department of Agriculture (USDA). Data was obtained the USDA's Economic Research Service, Food Environment Atlas (2018, March), https://www.ers.usda.gov/data-products/food-environment-atlas/data-access-and-documentation-downloads/ (accessed August 19, 2020).

A method called the "two-step floating catchment area method" (24) was used to calculate rates of behavioral health facilities accessibility within geographies. This method uses travel times, rather than straight-line distances, to measure the spatial barrier between populations and facilities. It also uses small geographic units (zip codes and census tracts of facilities and populations) which provides more details about accessibility variations.

(Note: Inpatient and outpatient facilities were comingled in this analysis because many inpatient behavioral health facilities offer outpatient services. In future work, inpatient and outpatient facilities can be separated and the analyses revised accordingly.)

Data on behavioral health facilities were obtained from SAMHSA's National Mental Health Services Survey 2019, https://www.datafiles.samhsa.gov/study/national-mental-health-services-survey-2019-n-mhss-2019-nid18958 (accessed September 15, 2020).

Population data for the analyses were retrieved from the United States Census Bureau's American Community Survey (ACS) 5-year estimates for 2018, https://data.census.gov/cedsci/all?d=ACS+5-Year+Estimates+Data+Profiles (accessed April 19, 2020).

Appendix D:
Approach to Community Input and Community-Specific Findings

Community Input Approach

University of Illinois at Chicago's (UIC) Institute for Healthcare Delivery Design (IHDD) engaged community partners from the East St. Louis Metro Area, South Cook, South Chicago, and West Chicago to recruit and facilitate 57 remote community conversations via conference call with a total of 252 residents between June and November 2020. UIC researchers offered session support through a facilitation guide and training, technical assistance, notetaking, and data analysis. Each community partner recruited a convenience sample of residents through their preferred recruitment channel. The sample included a mix of age, gender, race/ethnicity, and health insurance status. Values of equity, relationship-based trust, and collaboration guided the work with community partners.

The goals of the community input sessions were to:

1. Understand the health conditions and diseases important to community members.
2. Determine factors that make it hard to prevent and manage these diseases in each respective community area
3. Determine what existing or new resources are needed to help community manage these diseases

Selecting Zip Codes for Community Input in Each Community Area

Participant recruiting focused on specific zip codes within each community area. The specific approach used to identify zip codes was the following:

1. *Determine the social determinants of health profiles of zip codes*. Each zip code was characterized with respect to 23 social determinants of health (SDOH) variables and life expectancy estimates using data derived from the 2014-2018 American Community Survey (ACS), 2010 U.S. Decennial Census, Institute for Child, Youth and Family Policy, and the CDC's Behavioral Risk Factor Surveillance Survey (BRFSS) and Small-Area Life Expectancy Estimates Project (25–29). The SDOH variables included the prevalence of behavioral risk factors health conditions such as obesity, current smoking, diabetes, and chronic obstructive pulmonary disease, as well as 3 multidimensional composite socioeconomic (SES) indicators: Concentrated Disadvantage (CD), Economic Hardship Index (EHI), and Child Opportunity Index (COI) 2.0 (30–32). All data and measures were obtained at the census tract level and aggregated up to the zip code level using standard areal interpolation techniques followed by manual adjudication of the results (33).

2. *Identify SDOH characteristics more negatively correlated with life expectancy (LE).* SDOH-LE correlations were ranked from most negative to most positive, and SDOH characteristics with correlation coefficients of $r > 0.65$ were identified.
3 *Identify most "distressed" zip codes in the community area.* Zip codes were ranked with respect to LE and each of the SDOHs most negatively correlated with LE. Those in the worst quartile for LE and for each of the SDOH were identified. This resulted in a list of most "distressed" zip codes. This list was used as a sampling frame from which to select zip codes with the highest inpatient admission rates among Medicaid enrollees.
4 *Identify zip codes with highest inpatient admission per capita Medicaid enrollees.* Hospital-based utilization data for persons enrolled in Medicaid during FY2018 were obtained from HFS. Inpatient admission rates were calculated for each of the most distressed zip codes per 100 Medicare enrollees in each zip code during FY2018 (34).
5 *Finalize list of target zip codes:* Zip codes that were the most distressed and had the most Medicaid enrollee inpatient admissions per capita were targeted for community input.

See Table 30 for the East St. Louis area zip codes targeted using this methodology for each community area.

Community Partner Selection

Criteria used to identify and select community partners included health mission alignment, community embeddedness in target zip code areas, and current capacity to recruit and facilitate community conversations. Community partners were identified through existing academic-community partnerships at UIC or via introductions to organizations through those existing partnerships. Final community partner selection was done in collaboration with HFS. Several of the community-based organizations that were contacted declined participation due to bandwidth constraints and the urgency to address basic client needs in response to COVID-19.

After aligning on the intended scope of work and entering a contract agreement, UIC researchers onboarded community partner moderator(s) to a facilitation guide focused on understanding, from a resident perspective, the most pervasive health conditions and key barriers to staying healthy and accessing care and treatment. Feedback from community partners was integrated to tailor sessions for cultural appropriateness and vocabulary. All sessions were conducted in English, except in West Chicago and South Cook. Ten of 15 sessions held in West Chicago were conducted in Spanish. One of the 13 sessions held in South Cook was conducted in Spanish. For these sessions, the guide was translated and the sessions facilitated by a Spanish speaker.

Sample Size, Recruitment Approaches and Incentives

For each community area, community partners recruited a convenience sample of 50–75 residents across age, gender, race/ethnicity, and insurance status. UIC supplied a flier to market the sessions and each partner employed their own recruitment tactics based on existing relationships, communication channels, and engagement methods.

In East St. Louis, the Madison County Housing Authority recruited residents from its public and mixed-income housing developments, and the University of Illinois Extension Service leveraged its contacts among residents, obtained through its community education and outreach efforts. Both East St. Louis area partners contacted residents via phone and email. In South Cook, the pastors of Southland Ministerial Health Network recruited parishioners from their respective congregations via phone. In the West Chicago Latinx community, the Chicago Hispanic Health Coalition recruited via street outreach and partner engagement. In the West Chicago Black community and in South Chicago, Teamwork Englewood leveraged their existing social media presence and posted Facebook ads. Anyone interested in participating was asked to complete a Google intake form. This step was followed by direct outreach to participants across age, gender, and zip code.

Participants in all areas were compensated for their time in the form of a $50 gift card or check.

Table 30: East St. Louis Community Input Target Zip Codes and Partner Organizations

Target Zip Codes ("Most Distressed")	Community Partner	Mission	Leadership	Recruitment & Facilitation
62002 (Alton/East Alton, IL) 62025 (Edwardsville, IL) 62040 (Granite City, IL) 62059 (Brooklyn, IL) 62060 (Madison, IL) 62090 (Venice, IL) 62095 (Wood River, IL) 62201 (East St. Louis, IL) 62203 (Centreville, IL) 62204 (Washington Park, IL) 62205 (Centreville, IL) 62206 (Cahokia, IL) 62207 (Centreville, IL) 62234 (Collinsville, IL)	University of Illinois Extension Service Madison County Housing Authority	The mission of the Illinois Extension is to provide practical translations of cutting-edge research to help people, businesses, and communities find answers to some of the most pressing issues of our modern world. The mission of the MCHA is to provide a variety of safe, affordable housing options to very low and low-income residents across Madison County, as well as elderly and disabled members of the community.	Amy Cope, Director, U of I Extension Service County Director Andy Hightower, Executive Director, Madison County Housing Authority	*University of Illinois Extension Service:* Joey Fonseca Katrina Galati *Madison County Housing Authority:* Marie Nelson Rosie Brown

Discussion Guide

In order to understand the social, economic, and physical factors influencing health and healthcare access, the discussion guide was informed by 2 prominent preventive medicine and public health frameworks: the Levels of Prevention framework (35) and the Healthy People 2020 Social Determinants of Health (SDOH) framework (36).

The Levels of Prevention framework includes 3 categories across the prevention spectrum: primary prevention aimed at preventing the onset of specific diseases by limiting exposure to key risk factors, secondary prevention aimed at preventing progress of specific diseases through early detection and treatment, and tertiary prevention aimed at preventing negative quality of life and longevity impact for patients with specific diseases. Adaptations to the initial framework have been made since its development which include the addition of a fourth category called primordial prevention, aimed at preventing broad health determinants at the population level. For the purpose of the discussion guide, the researchers translated the levels of prevention into everyday language (for example, primordial level as "staying healthy," primary level as "preventing X condition," secondary level as "accessing care and treatment for a condition," and tertiary level as "managing a condition when really sick"). Questions were developed across each of the 4 prevention levels.

The Healthy People 2020 SDOH framework includes 5 categories

- neighborhood and built environment
- health and healthcare
- social and community context
- education
- economic stability

The framework is built on a growing body of evidence that suggests the home environment, schools, workplace, and neighborhoods play an important role in preventing disease and improving health outcomes. For the purpose of the discussion guide, researchers developed probes as follow-up questions for each of the social determinants of health (for example, for neighborhood and built environment a variation of the following question was asked: "Is there anything related to our built environment that makes it hard? By built environment, I mean things like our streets, sidewalks, parks, open space, etc.").

Here is the discussion guide used for the community input sessions:

Discussion Guide

0) [Introduction]

Hello, my name is [name of moderator] and I'm from [community partner]. Before we begin, I would like to take this opportunity to let you know how much we appreciate you committing to this HEALTH discussion. [Community Partner] has partnered with the University of Illinois Chicago to conduct discussions about

health in [community area] communities.

The information we gather will be used to help healthcare providers and other organizations get funding to develop new programs to help address top health issues. Your participation in this discussion will be kept confidential. We will share anonymous quotes in reports that we provide to HFS with the purpose of reporting community priorities. Our discussion is scheduled to last 1 hour and 30 minutes. You must participate for the entire time of the discussion in order to be compensated. You will receive $50 in the form of a gift card [or check]. Our discussion will be recorded and others from my team may have questions for you at the end of the discussion. Can I have your permission to record our discussion today? [Get verbal permission; start recording]

Just to confirm: I asked for, and everyone on the call gave, permission to record this discussion. Is that correct? [Go around and have each person state their name and restate their permission to record.]

One request as we get started here: Before answering a question or adding a comment to the discussion, state your first name so that we know who's talking.

Here's an overview of how we'll spend the next 90 minutes:First, we will do some brief introductions. Then, we will then identify 1 or 2 of the most important health conditions in our community.
For each health condition (we will likely get through 1–2), we will go through a set of questions and ask for you all to share your perspective on:

a) Challenges related to prevention
b) Challenges related to care and treatment
c) Challenges related to supporting someone who is really sick
d) Finally, we'll talk about resources that exist or are needed in our communities to help with this health condition

1) [Resident Introductions]

- What is one word a family member or close friend would use to describe you?
- What do you do?
- What the word "health" means to you?

2) [Health Issues in Our Community]

- Several months ago, the UIC School of Public Health analyzed data about why people end up in the hospital in South Chicago. The top 3 reasons are:

South Cook

- mental illness such as depression, bipolar, and schizophrenia
- heart disease
- respiratory illnesses such as acute asthma and chronic obstructive pulmonary disease (COPD)
-

West Chicago

- mental illness such as depression, bipolar, and schizophrenia
- substance use disorders
- respiratory illnesses such as acute asthma and chronic obstructive pulmonary disease (COPD)

South Chicago

- mental illness, especially bipolar disorder, depression and schizophrenia

- hypertensive diseases (aka high blood pressure)
- substance use disorders

East St. Louis Metro Area

- mental illness, especially bipolar disorder, depression and schizophrenia
- hypertension (aka high blood pressure)
- Are there other important diseases or health conditions that you see here in [community area] that aren't on this list?
- Have you or someone you know been personally affected by any of the issues that have been mentioned?
- Of all of the issues mentioned so far, which condition do you believe is the #1 most important health issue facing our communities? [Get consensus on 1–3 of the most important health issues for community participants

[NUMBER 1 HEALTH ISSUE IN DETAIL]

Let's talk about [#1 most important condition] in more detail, specifically, about challenges related to prevention, care and treatment, and supporting someone when they are really sick. We will also discuss resources that exist in our communities for this health issue.

[For each question below, probe on relevant social determinants of health]

a) What makes it hard to PREVENT this health issue
b) For those with this health issue, what makes it hard to get CARE AND TREATMENT that they need?
c) Think about what happens when someone is really sick with this issue. What makes it hard for someone in our community who is really sick with this issue get the support they need?
d) Finally, we'd like to discuss and learn about the existing resources or assets in our communities that support people who are living with this condition. What's happening, or what exists, in our communities right now that's working to help people to prevent or manage this health issue?

[#2 & #3 HEALTH ISSUE IN DETAIL—Go through questions A–D above as time allows]

[SOCIAL DETERMINANTS PROBES]
(moderators select 2–3 relevant probes or adaptation to each level of prevention)

i) Is there anything related to **healthcare resources** like doctors, hospitals, clinics, treatment centers or pharmacies that makes it hard?
   (a) Any issues making an appointment?
   (b) Any issues at the point of service?
   (C) Any issues with the treatment plan / caring for the condition over time?

ii) Is there anything related to **food or food access** that makes it hard?
iii) Is there anything related to our **built environment** that makes it hard? By built environment I mean, things like our streets, sidewalks, parks, open space, etc.
iv) Is there anything about our air or water quality—or other **environmental issues**—that makes it hard?

v) Is there anything about **transportation** in our community that makes it hard? By transportation, I

mean everything from public transit to taxi services to access to highways.

vi) Is there anything about **housing** in our community that makes it hard?
vii) Is there anything about **education** in our community that makes it hard?
viii) Is there anything **economically** that makes it hard?
ix) Is there anything related to **child care or caring for adult dependents or elderly care** that makes it hard?
x) Is there anything about our community's **social fabric** that makes it hard? And by social fabric, I mean our trust of and reliance on one another and our trust of, and ability to work with, governmental organizations.

Format of Input Sessions

Ninety-minute small group conversations with 1 to 6 residents were held via WebEx phone call. Participants verbally consented to recording for data processing purposes and reaffirmed voluntary consent to participate once the recording started. After sharing background information about the study and facilitating resident introductions, the moderators cited the top 3 diseases or disorders leading to hospitalization (per analysis of Medicaid utilization data by the UIC School of Public Health) in the current community area. Community residents were then asked to add to the list of top health issues from their perspective and lived experience. Taking the list of health issues as a whole (top 3 from the data and conditions offered by residents), residents commented on whether they had experience with any of the conditions either in terms of their own health or that of people they know. The moderators then inquired about which conditions, from residents' perspective are the most widespread in their community. After reaching consensus on the top 1–3 conditions as perceived by the resident participants, moderators focused on these top conditions one-by-one and asked about barriers, challenges, and resources (current and desired) across each level of prevention, while also probing for social determinants of health.

Throughout the discussion, participants were encouraged to reflect on and share stories about their own lived experiences and those of loved ones. UIC researchers supported moderators with real-time follow-up questions prompted via text message or WebEx chat.

Sessions Analysis and Reporting

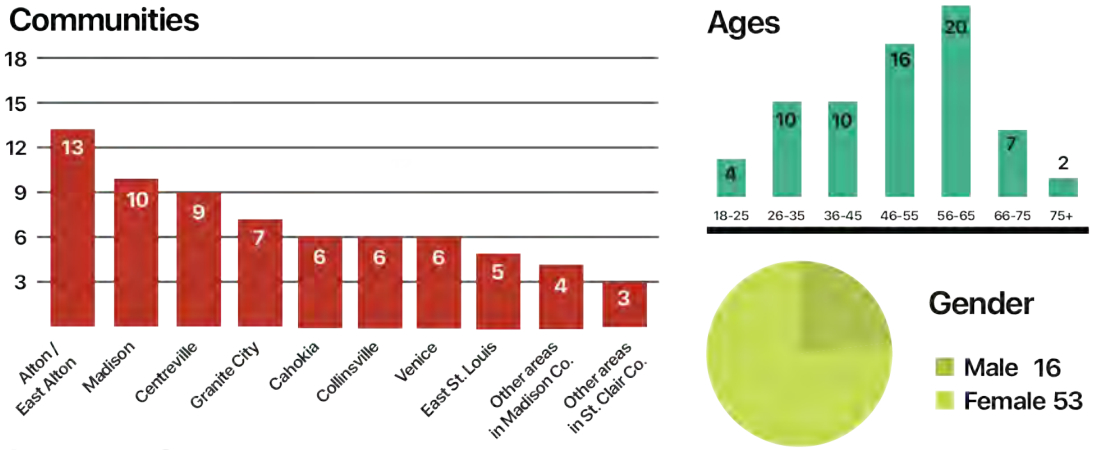
UIC researchers reviewed audio recordings and detailed notes to summarize barriers, challenges, and issues that surfaced during the community input sessions. Qualitative analysis applied affinity clustering to participants' remarks to identify common themes, surface domains of consensus and divergence, and summarized these barriers using a care journey framework (See Figure 4 in the Findings section of the report). Additionally, representative resident quotes and stories were pulled and curated to bring out the human perspective. Community partners were asked to offer feedback on the data represented and storytelling contained in draft summary reports. Upon publication of this report, community partners will disseminate the project objectives and findings to resident participants and among their broader stakeholder networks.

Community Input Details: East St. Louis

Participant Sample Size and Demographics

69 participants

Community Input Dates
October 20–November 12 , 2020



Insurance Status

Uninsured	++ 2
Insured - Medicare	++++++++++++ 12
Insured - Medicaid	++++++++++++++++++++++++++++ 27
Insured - Private (empl.)	++++++++++++++++++++++ 22
Insured - Private (self)	+++++ 5
Insured - VA	+ 1

Top Health Conditions

Utilization Data:

- Mental illness (especially, bipolar, depression, and schizophrenia)
- Substance use disorders
- Hypertension

Community Input

- Diet-related diseases (hypertension, heart disease, diabetes and obesity)
- Substance use disorders
- Cancer

Recruitment Approach

Two community organizations recruited and hosted small group discussions in East St. Louis:

- The University of Illinois Extension Service recruited and hosted community input sessions for residents in target zip codes in St. Clair County. To recruit participants, the Extension service used its network of residents who have been involved in its community education and outreach programs, in particular its SNAP-Ed program (a nutrition education and obesity prevention program).
- The Madison County Housing Authority (MCHA) recruited and hosted community input sessions for residents in Madison County. MCHA recruited residents from its housing developments as well as friends and family members of those residents.