

South Central CACE Hub

Community Asthma Care & Education



ABSTRACT

Asthma is a prevalent health condition that can be controlled through a combination of care. The South Central Community Asthma Care and Education (CACE) Hub comprises 12-counties and this report describes the prevalence, interventions, and health impacts of pediatric asthma in this area.

**Asthma
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Abstract

- ❖ Asthma is a chronic condition affecting children and adults in Missouri and nationwide. Nationwide, it is estimated that more than 25 million children and adults currently have asthma. The South Central Community Asthma Care & Education (CACE) Hub area of Missouri, comprised of 12 counties (Christian, Dallas, Douglas, Howell, Laclede, Oregon, Ozark, Polk, Taney, Texas, Webster, and Wright), has a substantial population of children with asthma.
- ❖ In Missouri, approximately one-half million people currently have asthma with ~91,000 being children. According to the 2021 data, the prevalence of adults living with current asthma in Missouri is 9.4%, which is similar to the U.S. (9.7%).
- ❖ According to the Behavioral Risk Factor Surveillance System, the estimated prevalence of current asthma among children in Missouri is 7.1% compared to the U.S. 6.5%. The asthma prevalence among children in the South Central CACE Hub varies by region of assignment of the county and ranges from 6.7% (Southeast) to 8.0% (Central).
- ❖ Children with asthma, aged 0 to 17 years, residing in the South Central CACE Hub have had consistently lower asthma emergency department (ED) visit and hospitalization rates than the state.
- ❖ To inform and guide geographic distribution of interventions, analysis of Medicaid administrative claims data indicated that in the South Central CACE Hub where children are experiencing persistent asthma and indicated almost one-third (28%) have uncontrolled asthma.
- ❖ Hospitalization data for children and teens in Missouri has a seasonal pattern. Combining 2011-2015 indicate two peak periods: 1) May and 2) October. For the South Central CACE Hub, the inpatient hospital admission rate for children and teens increased from April to May and peaked in October.
- ❖ In Missouri, among children and teens aged 0 to 17 with asthma as the primary diagnosis, hospital charges totaled \$20.8 million and children / teens from the South Central CACE Hub accounted for about 2.7% (\$552 thousand) of these charges (2015). Medicaid accounted for the largest pay source cited.
- ❖ The proportion of outpatient and preventive visits to total care encounters (POPte) score of 71% indicates that 7 in 10 asthma care encounters are occurring as outpatient and preventive visits in the South Central region.
- ❖ The South Central Hub has 61 public school districts with more than 58,000 total students, representing approximately 7% of the current enrollment in public schools in Missouri.
- ❖ Interventions implemented in the South Central CACE Hub have included Asthma Ready® trainings for clinics, hospitals, and clinicians; Asthma ECHOs; Becoming an Asthma Educator & Care Manager (BAECM), school interventions such as Teaming Up for Asthma Control (TUAC), presentations, partner meetings, and early childhood initiatives.
- ❖ The health care system in the South Central CACE Hub includes primary care providers, hospitals, clinics, community health centers, public and mental health services, and environmental and school services, There are many additional community resources also available.

Asthma Ready® Communities

University of Missouri

Columbia

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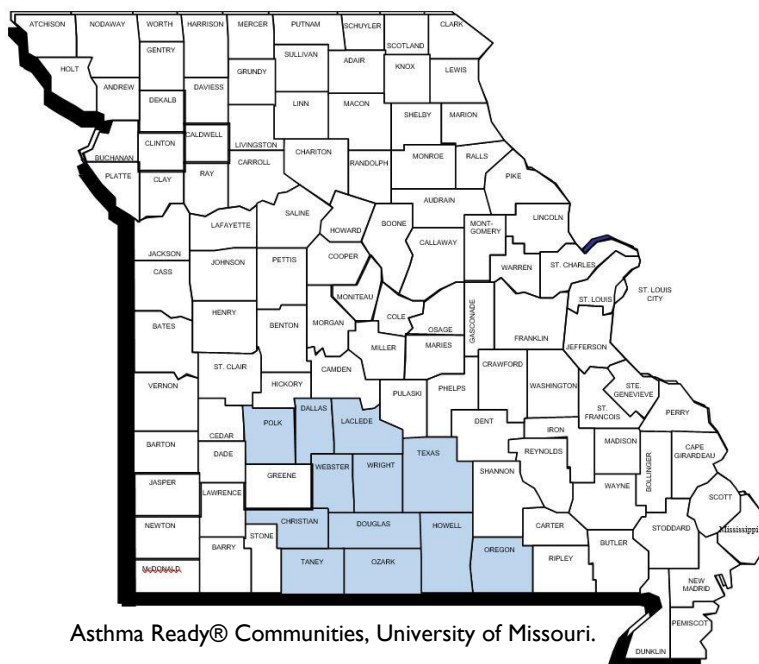


South Central Hub

Childhood asthma is one of the most prevalent conditions faced by families, schools, and health clinicians. Nationwide, an estimated 25 million people are living with asthma of which 4.7 million are younger than age 18 (2021).¹ Children and teens with asthma are especially vulnerable to persistent symptoms or uncontrolled asthma affecting learning, wellness, and overall quality of life.^{2,3} Community Asthma Care and Education (CACE) Hubs are designated, contiguous multi-county regions identified through Medicaid claims data as having disparate rates of uncontrolled pediatric asthma (i.e., high acute care utilization and medications). These Hubs establish partnerships and implement interventions to improve pediatric asthma control. The South Central CACE Hub includes 12-counties (Figure 1).

Figure 1

South Central Community Asthma Care and Education (CACE) Hub counties, Missouri, 2024



Christian County is the most populous county in the South Central CACE Hub region followed by Taney, Howell, and Webster counties (Table 1).⁴ Children aged 0 to 17 years account for approximately 1 in 4-5 people in each county with the exception of the Ozark County which is a little less. African-Americans comprise a small proportion in each county with Texas County having the largest proportion (3.8%). Taney County has the largest Hispanic/Latino population (6.2%). Among persons younger than age 65 without health insurance ranges from a low in Douglas County (7.7%) to Ozark and Texas Counties (19.4% each). Four counties (Dallas, Oregon, Ozark, and Texas) have approximately one in five persons (> 20%) living in poverty. Ozark County (20.7%) has the largest proportion of households without a computer followed by Douglas (17.9%) and Wright (15.1%) counties.

Table 1

Characteristics and Select Indicators for the South Central Community Asthma Care and Education (CACE) Hub Counties and Missouri, 2021

County	Population	Age			Race ^a / Ethnicity			No Health Insurance	Persons in Poverty	Households without computer ^b
		0-17 Percent	18-64 Percent	≥ 65 Percent	White Percent	Black Percent	Hispanic Percent	Age ≤ 65 years Percent	Percent	Percent
Christian	91,499	25.1	58.8	16.1	95.6	0.9	3.1	12.0	8.8	6.2
Dallas	17,341	23.7	55.5	20.8	96.2	0.4	2.2	17.2	24.1	12.0
Douglas	11,732	22.1	53.0	24.9	96.1	0.5	1.8	7.7	7.8	17.9
Howell	39,975	23.9	56.0	20.1	96.0	0.6	2.2	16.1	18.4	13.3
Laclede	36,133	24.7	57.5	17.8	95.5	0.9	2.6	14.2	16.3	11.6
Oregon	8,631	22.4	53.9	23.7	95.4	0.4	1.9	16.5	22.0	14.8
Ozark	8,782	19.2	51.5	29.3	96.4	0.2	2.0	19.4	20.3	20.7
Polk	32,043	22.7	59.0	18.3	95.5	1.0	2.5	16.0	15.6	13.3
Taney	56,387	20.9	57.0	22.1	93.5	1.8	6.2	18.0	15.6	8.2
Texas	24,987	21.3	57.2	21.5	92.8	3.8	2.2	19.4	20.3	13.7
Webster	39,735	26.8	57.5	15.7	95.7	1.2	2.2	14.8	15.0	13.5
Wright	18,610	25.7	54.7	19.6	96.5	0.6	2.3	19.0	18.3	15.1
Missouri	6,168,187	22.3	60.4	17.3	82.9	11.8	4.4	12.0	12.1	9.3

U.S. Census Bureau.

^a Others not shown.

^b 2016-2020

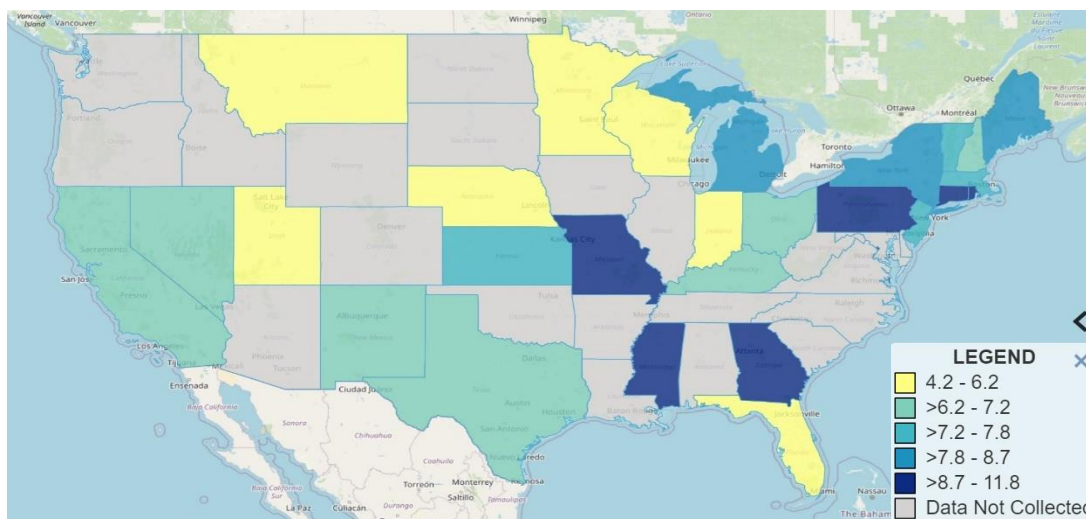
Asthma

Prevalence

The Behavioral Risk Factor Surveillance System (BRFSS) collects asthma prevalence information for children and adults.⁵ According to the 2021 data, the prevalence of adults living with asthma in Missouri is 9.4%, which is similar to the U.S. (9.7%).⁶ For children, the prevalence of current asthma in Missouri (7.1%) is 9.2% higher than the U.S. (6.5%) (2021). Missouri is among the states in the highest tier for the prevalence of childhood asthma (Figure 2).

Figure 2

Prevalence of Current Asthma among Children ≤ 17 years of age, United States, 2018-2020

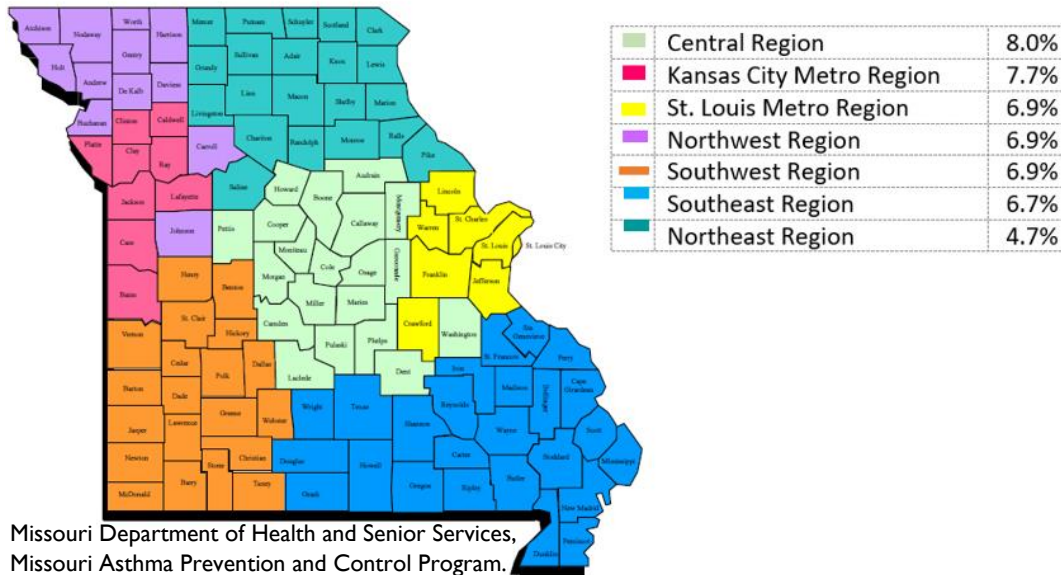


Centers for Disease Control and Prevention. Environmental Public Health Tracking Network. Asthma Prevalence among Children.

The South Central CACE Hub counties are dispersed in three Missouri BRSS regions: 1. Southwest (Christian, Dallas, Polk, Taney, and Webster); 2. Southeast (Douglas, Howell, Oregon, Ozark, Texas, and Wright); and 3. Central (Laclede) (Figure 3). Among these three Missouri BRSS regions, children in the Central Region have the highest rank in prevalence of current asthma.

Figure 3

Prevalence of Current Asthma among Children aged 0 to 17 years by BRSS Region, Missouri, 2021



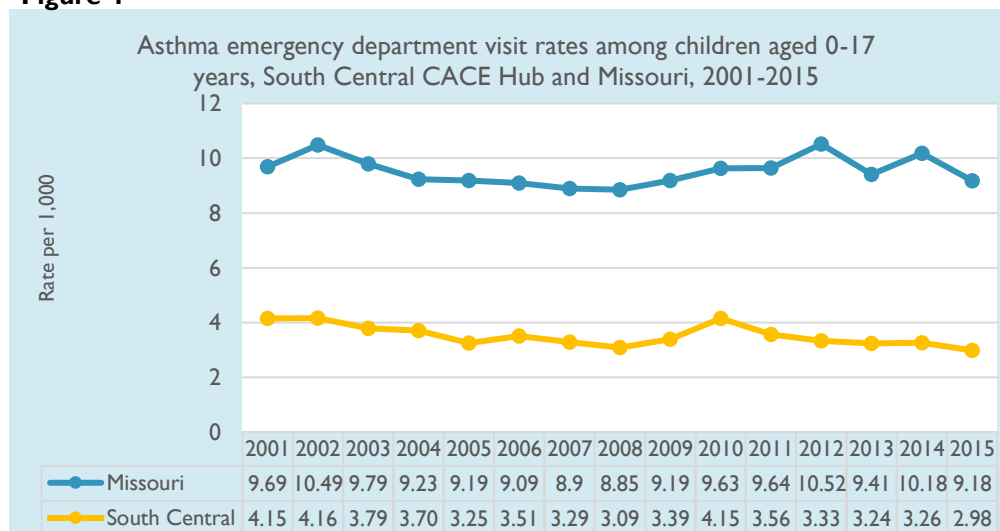
Control

In Missouri, more than one-half million people currently have asthma with an estimated 91,000 being children (2021).⁶ While asthma occurs among all population groups, it is particularly a health issue among children and teens and is more common among African-Americans and in households with lower incomes and education. While asthma cannot be cured, the goal is optimal control. Well-controlled asthma results in increased productivity and low morbidity and overall health costs. Approximately 47.9% of children with asthma in Missouri are uncontrolled (2018-2020).² This leads to frequent symptoms and urgent asthma attacks resulting in impairment (e.g., interference with sleep and normal activity), absenteeism from school, and a disproportionate share of emergency department (ED) visits and hospitalizations.

Emergency Department Visits and Hospitalizations

Figure 4

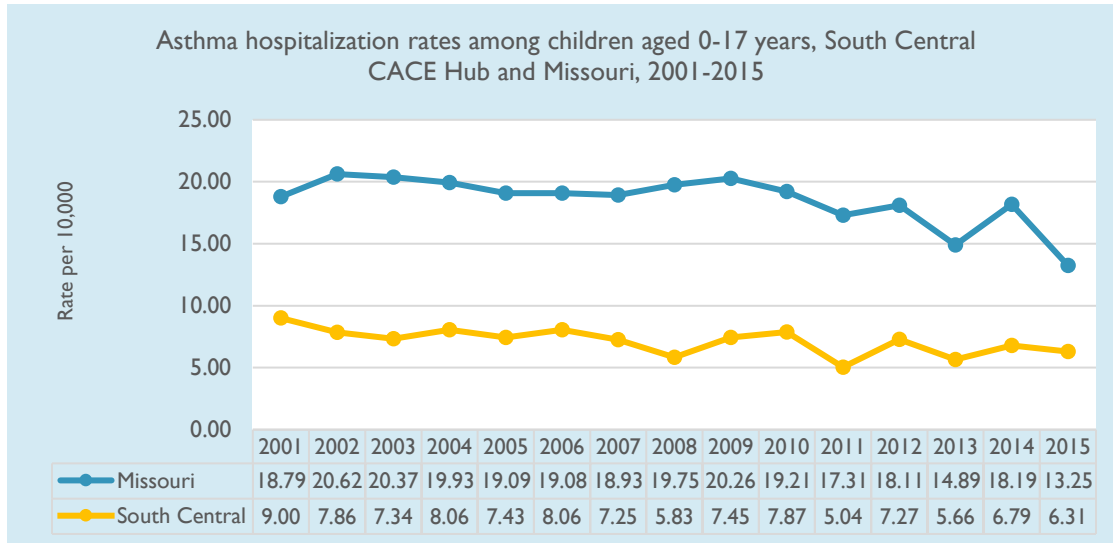
The emergency department visit rates for children with a primary diagnosis of asthma in the South Central CACE Hub have consistently been significantly lower than the state rates (Figure 4).



Missouri Department of Health and Senior Services. Missouri Public Health Information Management System (MOPHIMS), Inpatient Hospitalizations, Missouri Information for Community Assessment (MICA).

Similar to ED visits, asthma hospitalizations for children living in the South Central CACE Hub have also been consistently significantly lower than the state rates (Figure 5). The asthma hospitalization rates for children in the South Central Hub shows a 30% decline comparing 2001 (9.0%) to 2015 (6.3%). The Missouri asthma hospitalization rates for children also showed a decline of 29.5% comparing the same years.

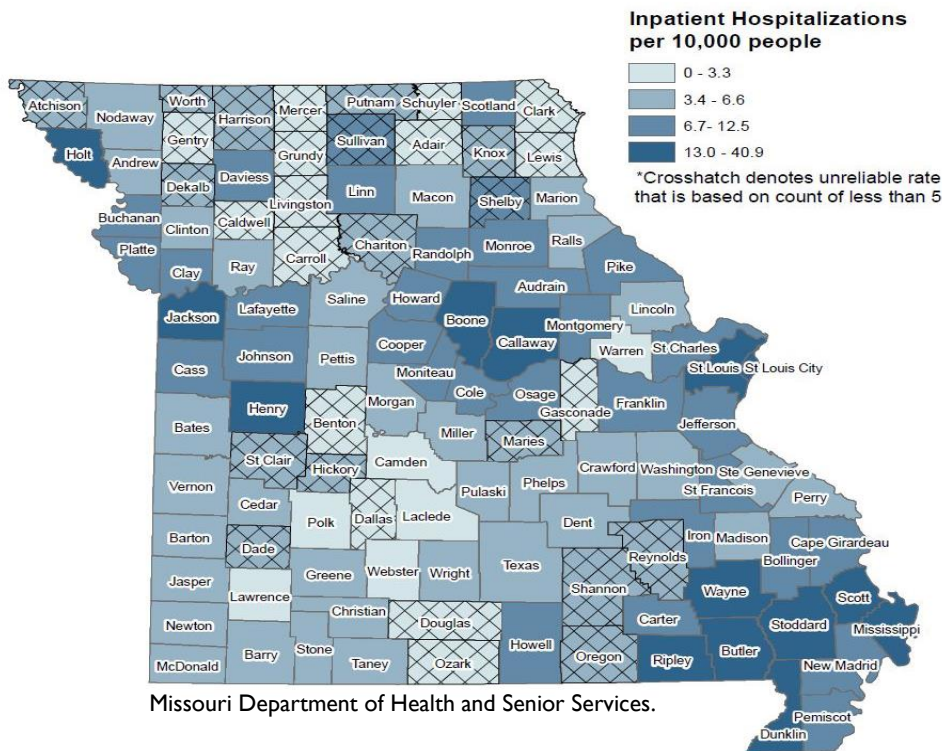
Figure 5



More recent hospitalization data continue to show low asthma hospitalization rates for the South Central CACE Hub counties (Figure 6). These counties are in the lower two tiers for the rate of hospitalizations among children younger than age 18, with the exception of Howell County, which is in the third tier.

Figure 6

Asthma Inpatient Hospitalizations under Age 18, Missouri, 2016 – 2019



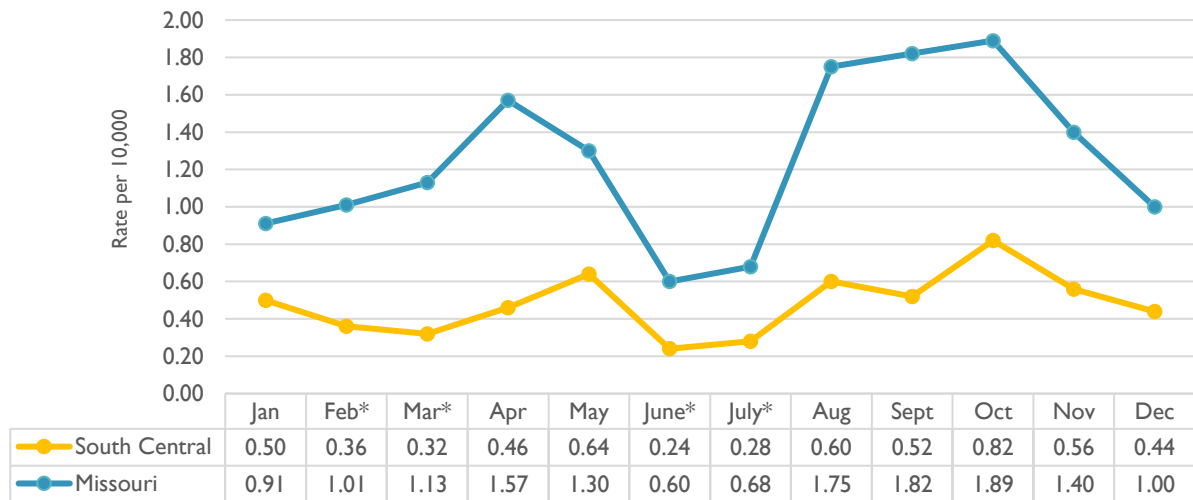
In Missouri, among children and teens aged 0 to 17 with asthma as the primary diagnosis, hospital charges totaled \$20.8 million and children / teens from the South Central CACE Hub 12-county area accounted for about 2.7% (\$552 thousand) of these charges (2015).⁷ Medicaid accounted for the largest source cited (78.1%) followed by commercial insurance (17.1%) for asthma hospital charges among children in the South Central Hub area. Self-pay or no charges accounted for approximately 4.1% of the asthma hospitalization charges among children in the South Central CACE Hub. As these data indicate, asthma continues to be a heavy financial weight on children and families enrolled in Medicaid.

Seasonality

Asthma ED visits and hospitalizations have seasonal patterns. For children and teens aged 0 to 19, the asthma hospital admissions rates by month for Missouri show a bimodal distribution indicating two peak periods, April and October (Figure 7).⁵ For the South Central CACE Hub, the inpatient hospital admission rate for children and increase April through May and peak in October. Both Missouri and the South Central Hub show substantial low rates in asthma hospital admissions for children and teens June-July.

Figure 7

Asthma inpatient hospital admission rates for children aged 0 to 19 years by month, South Central CACE Hub and Missouri, 2011-2015



*Rate is unreliable; numerator less than 20

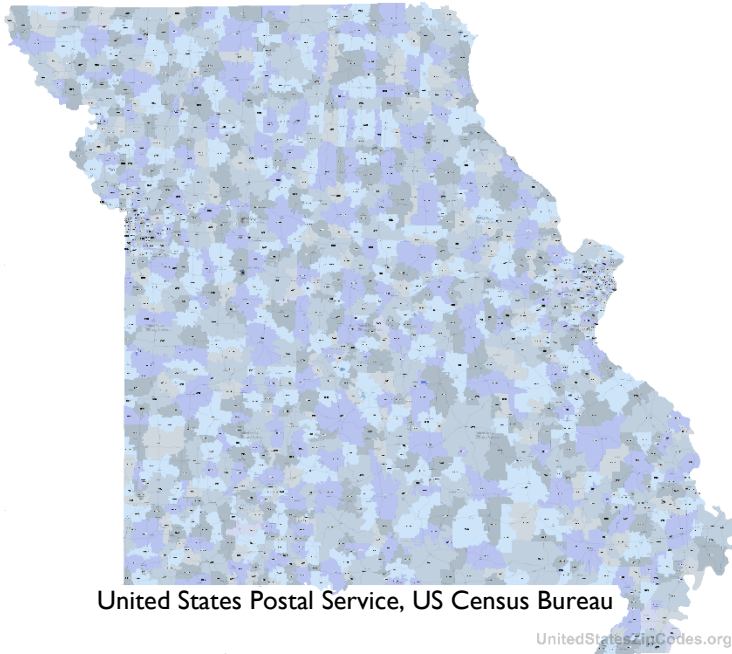
Source: Missouri Department of Health and Senior Services. Missouri Public Health Information Management System (MOPHIMS). Environmental Public Health Tracking



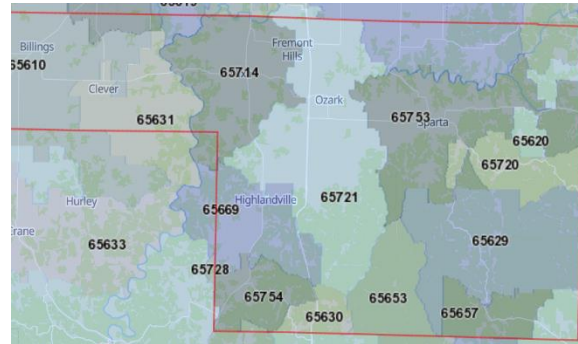
Zip Codes

Figure 8.

Missouri County Zip Codes, 2022



The Missouri Zip Codes Map (Figure 8), using the ZIP Code Tabulation Areas (ZCTAs) as specified by the United States Census Bureau, approximate the area covered by a ZIP code.⁸ The South Central 12-county area has more than 180 ZIP codes. Most are residential (96.2%), but a small number (7 or 3.8%) are PO boxes with low or no residential populations (Table 2). Counties with large numbers of Zip codes are shown.



Christian County, MO

County	Number of Residential Zip Codes	PO Boxes	Most Populous Zip Code	Percent of County Population %
Christian	20	0	65714	38
Dallas	13	0	65622	49
Douglas	15	0	65608	67
Howell	12	1	65775	61
Laclede	11	0	65536	80
Oregon	12	0	65791	42
Ozark	19	1	65655	33
Polk	17	1	65613	56
Taney	19	3	65616	45
Texas	19	0	65542	26
Webster	9	1	65706	40
Wright	11	0	65711	41
Total	177	7	--	--
*Less than 2; --not applicable.				

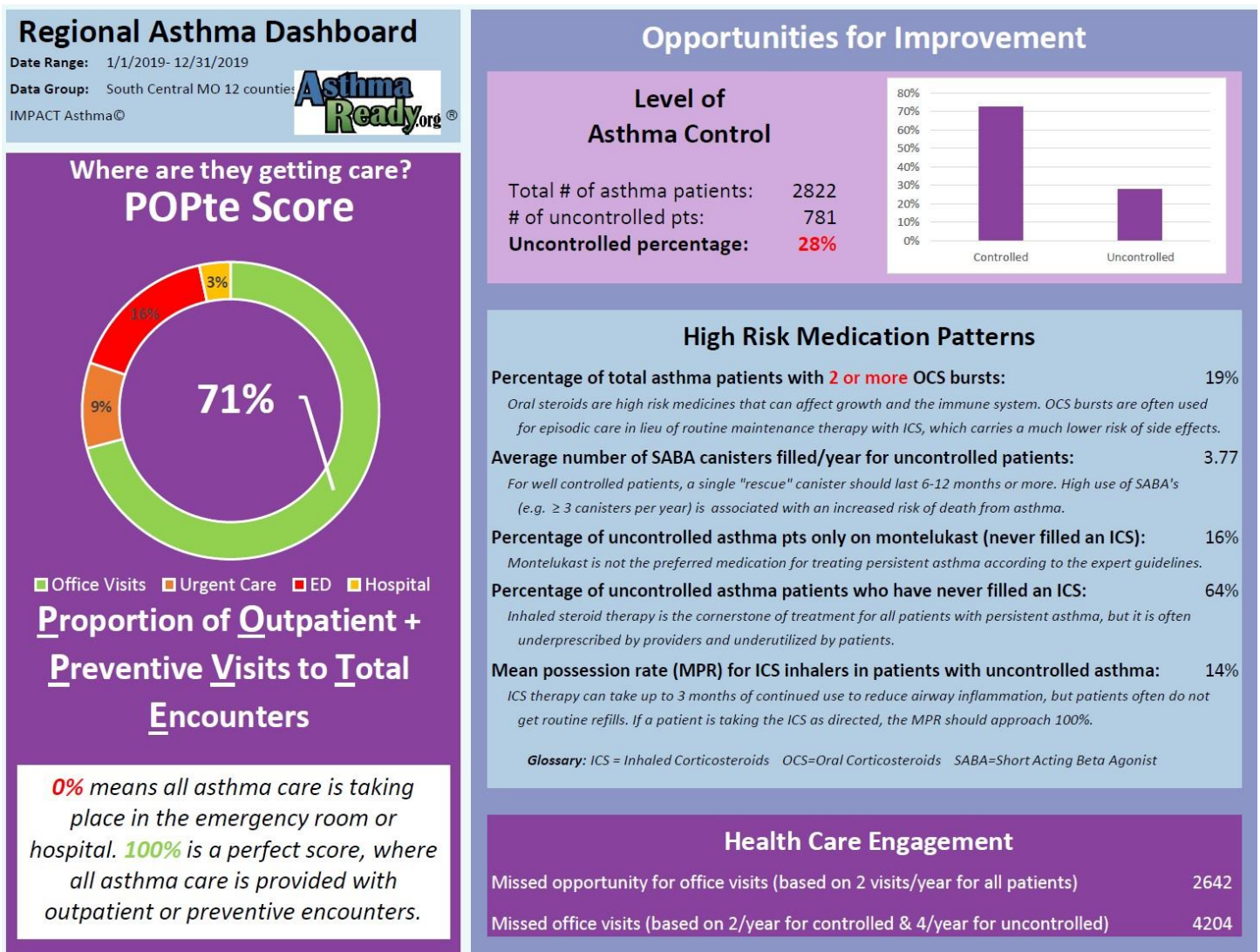
Table 2

Number of Zip Codes, Most Populous, and Percent of County Population for listed Zip Code, South Central CACE Hub, Missouri

Programs

To focus programs in areas of greatest need, Medicaid administrative claims data are used to generate de-identified population-based asthma risk panel reports (ARPRs) and maps to identify children with uncontrolled asthma in Missouri. Risk indicators such as frequent asthma acute care visits (i.e., emergency visits and hospitalizations) and medication overuse (i.e., short acting beta agonists or systemic oral steroids) or underuse (low control medication use) are used. This information is translated for clinicians, school nurses, and care managers as an asthma risk population panel report. These reports inform care management and practices. The baseline asthma risk panel report dashboard for children, teens and young adults (< 21 years) with asthma in the South Central CACE Hub for 2019 indicates 28.0% had uncontrolled asthma and a proportion sought care through the emergency room (16%) (Figure 9). Only 3% had been hospitalized for asthma. The proportion of outpatient and preventive visits to total care encounters (POPte) score of 71% indicates that 7 in 10 asthma care encounters are occurring as outpatient and preventive visits.

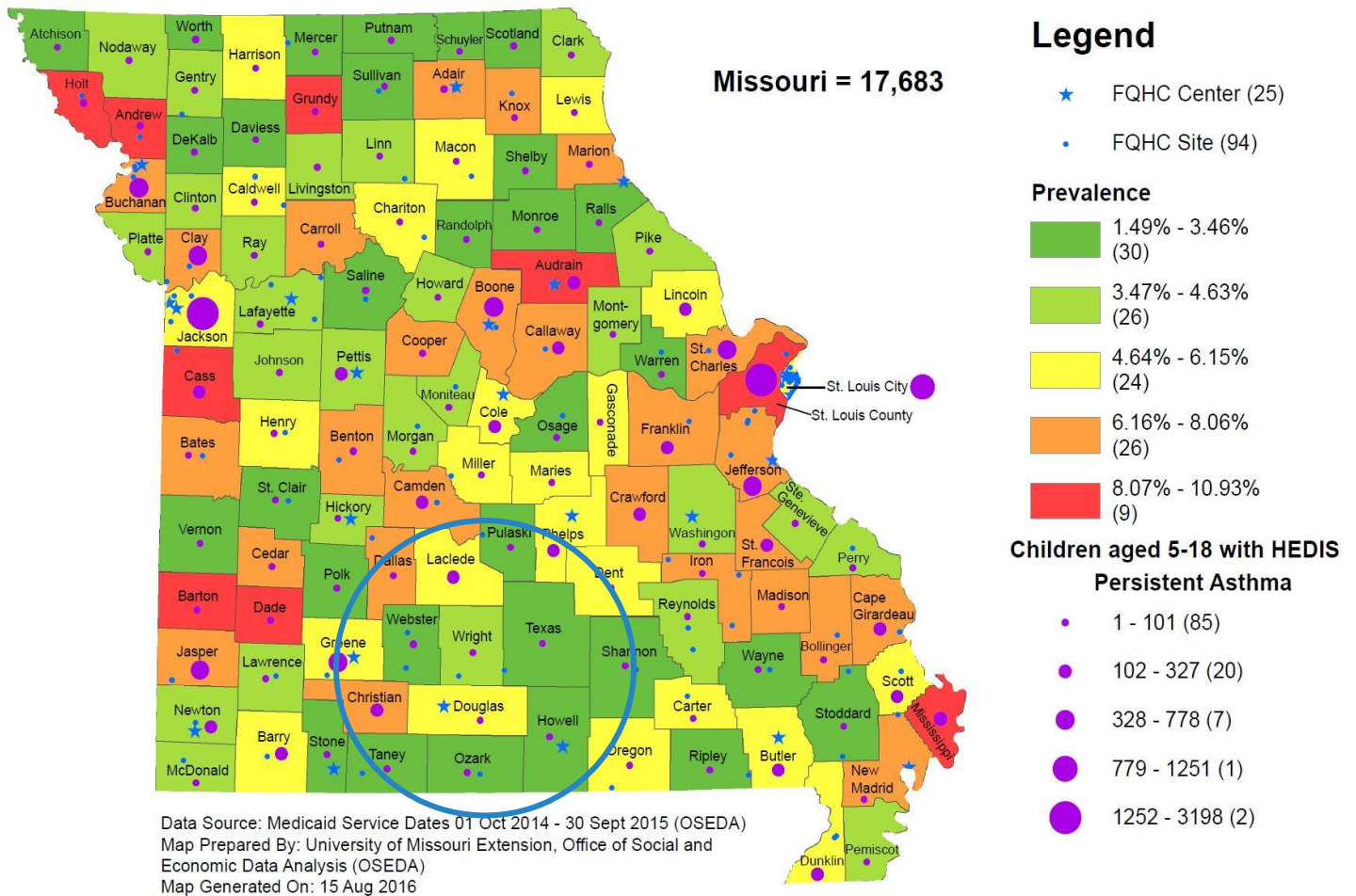
Figure 9



A map shows children throughout the South Central CACE Hub with persistent asthma (Figure 10). Persistent asthma was defined by the legacy Healthcare Effectiveness Data and Information Set (HEDIS) criteria: One asthma inpatient admission; or ED visit, or four asthma medication dispensing events, or four outpatient asthma visits and at least 2 asthma medication dispensing events. This criterion was applied for children with a primary or second diagnosis of asthma. Christian and Laclede Counties in the South Central Hub had high percentages of Medicaid enrolled children with persistent asthma.

Figure 10

Children with Medicaid with Persistent Asthma by County, Missouri, 2014-2015



The Asthma Ready® Communities (ARC) database contained 487 activity records for the South Central CACE Hub (Table 3). The activity records spanned March 2007 – February 2023. Legacy interventions such as, Asthma Ready® trainings for clinics, hospitals, and clinicians; Asthma ECHOs; and Becoming an Asthma Educator & Care Manager (BAECM) are leading interventions that have been implemented in the South Central CACE Hub counties. Other activities and interventions have included school interventions (TUAC), presentations, partner meetings, and early childhood initiatives.

Table 3

Key interventions to reduce pediatric asthma risk and improve control, South Central CACE Hub area, Missouri, March 2007 - February 2023

Intervention	Activity Records Number	Percent of participation records %
All	487	100.0
<i>Asthma Ready Clinic Training (ARCT) and Hospitals, Physicians Asthma Care Education (PACE), Intro to AR Clinics, Asthma Update, and CHW training</i>	160	32.9
<i>Extension for Community Healthcare Outcomes (ECHO)</i>	114	23.4
<ul style="list-style-type: none"> • <i>Impact Asthma – Essentials (77)</i> 		
<ul style="list-style-type: none"> • <i>Asthma Care Accelerator – Quality Improvement / Maintenance of Certification (QIMOC) (13)</i> 		
<ul style="list-style-type: none"> • <i>Asthma Care & Education – Community (24)</i> 		
<i>Becoming an Asthma Educator & Care Manager (BAECM)</i>	96	19.7
<i>Teaming Up for Asthma Control and school activities</i>	46	9.4
<i>Presentations / Professional Organizations / Partner Meetings, Conferences, Workshops</i>	44	9.0
<i>Courses – Acting on Behalf of My Child (ABC) and Asthma Control Everyday (ACE)</i>	11	2.3
<i>Childhood Asthma Linkages in Missouri (CALM-2)</i>	9	1.8
<i>Asthma Academy / Asthma Day</i>	7	1.4
University of Missouri, Asthma Ready Communities (ARC). South Central CACE Hub activity records.		

Community Agencies

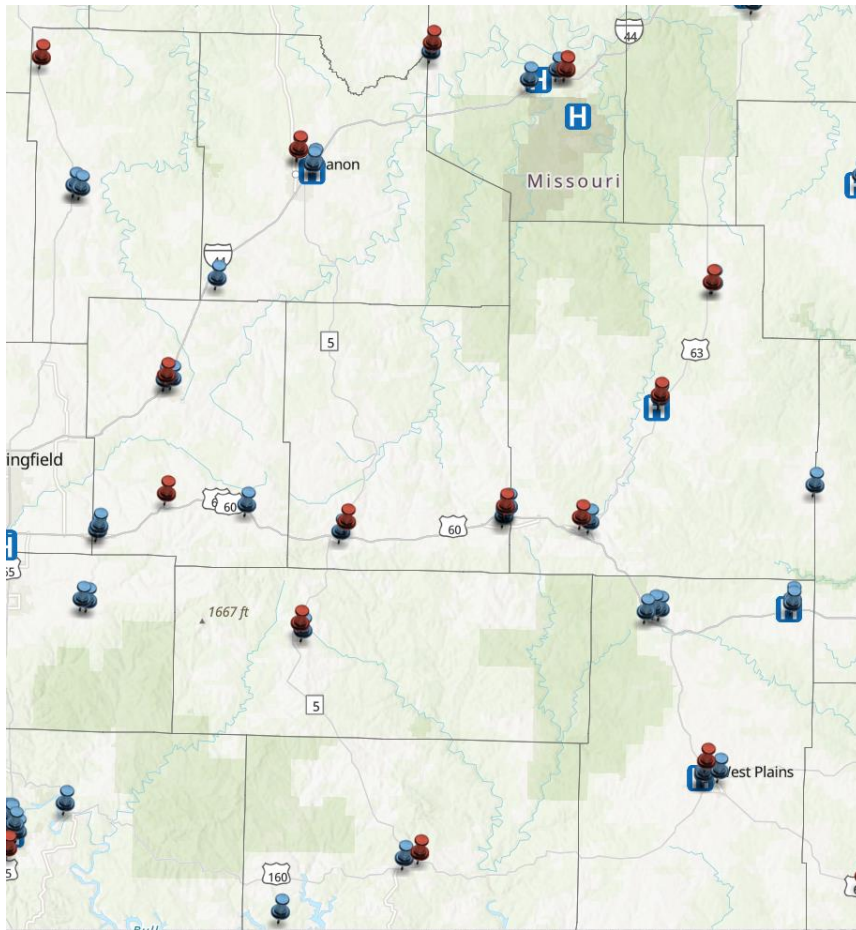
There are community resources available in the South Central CACE Hub and neighboring areas to assist children with asthma and their families. Resources include public health systems, departments, and social services, and assistance programs. The following provides some of the available resources:

- Christian County Health Department <https://www.christiancountyhealth.com/>
- Christian County Department of Social Services <https://mydss.mo.gov/>
- Community Partnership of the Ozarks: One Door referrals for housing and shelter services. <https://cpozarks.org/programs/one-door/>
- Least of These, Inc. Christian County food pantry. <https://leastofthesefoodpantry.org/>
- Ozarks Area Community Action Corporation services include housing assistance, energy programs, and weatherization <https://oac.ac/>
- Catholic Charities of Southern Missouri, disaster, housing, veteran and other services. <https://ccsomo.org/>
- OATS Transit, transportation services, <https://www.oatstransit.org/christian>
- Christian County Library, Ozarks Region Community Resource Directory <https://christiancountylibrary.org/community-resources/>
- United Way <https://www.211helps.org/> and Resource Directory <https://uwgkc.myresourcedirectory.com/>
- Dallas County, Buffalo Area Chamber of Commerce, Useful Community Links <https://buffaloareachamber.org/community-links>
- Douglas County Health Department <http://www.dchd.org/>
- Family Support Division: Douglas County <https://uwgkc.myresourcedirectory.com/index.php/component/cpx/?task=resource.view&id=2961460>
- West Plains RV-II Community Resource List 2021-2022 <https://www.zizzers.org/cms/lib/MO01001590/Centricity/Domain/33/2021-2022%20Community%20Resource%20List.pdf>
- Howell County Health Department <https://ccoazarks.org/resources/howell-county-health-department/>
- Ozarks Healthcare Community Resources <https://www.ozarkshealthcare.com/services/behavioral-health/httpswwwwozarkshealthcarecomservicesbehavioral-healthcommunity-re/>
- Laclede County Health Department <https://lacledecountyhealth.com/>
- Laclede County Community Resources Directory <https://lacledecountyhealth.com/wp-content/uploads/2021/03/Laclede-County-Community-Resource-Guide.pdf>
- Missouri Ozark Community Action Inc. <https://www.mocaonline.org/index.html>
- Missouri Department of Natural Resources, Weatherization <https://dnr.mo.gov/energy/weatherization>
- Polk County Health Center, Community Resource Directory, <https://polkcountyhealthcenter.org/community-resource-directory/>
- Taney County Health Department <https://taneycohealth.org/resources/>
- Resources to the Rescue, serving Stone and Taney Counties, <https://www.resourcestotherescue.org/resources>
- Elevate Branson Area Resources https://elevatebranson.org/wp-content/uploads/2022/03/EB_Area-Resources_March-2022.pdf
- Environmental Services <https://www.taneycounty.org/index.php?section=departments&department=28>
- Texas County Health Department, Resource Directory <https://www.texascountyhealth.org/resource-directory>
- Texas County Food Pantry Inc. Emergency Services <https://texascountyfoodpantry.org/emergency-services>
- Resources for Webster County <https://www.wcpartners.net/recources>
- Webster County Health Unit <http://webstercohealth.com/community-health/community-partnership/>
- Webster, Wright, Douglas, and Laclede County assistance programs https://www.needhelpayingbills.com/html/webster- wright- douglas_ and_ l.html
- Wright County Health Department <https://wrightcohealth.com/>

Health Systems

The health care system is comprised of primary care providers, hospitals, clinics, community health centers, public health, mental health services, school nurses, Medicaid and care management services, and community partners. In addition, there are several primary and mental health care, many rural, facilities designated as Health Professional Shortage Areas (HPSAs) in the South Central CACE Hub including federally qualified health centers, rural health clinics, and family care centers.⁹ The South Central CACE Hub area has several health care systems that participate in asthma interventions and activities including Cox Health, Compass Health, Jordan Valley, Mercy health system, Ozarks Community Health Centers, and others. Locations of the South Central hospitals, federally qualified health centers, and rural clinics are shown in Figure 11.

Figure 11



Hospitals, Federally Qualified Health Centers, and Rural Clinics, South Central CACE Hub counties, Missouri

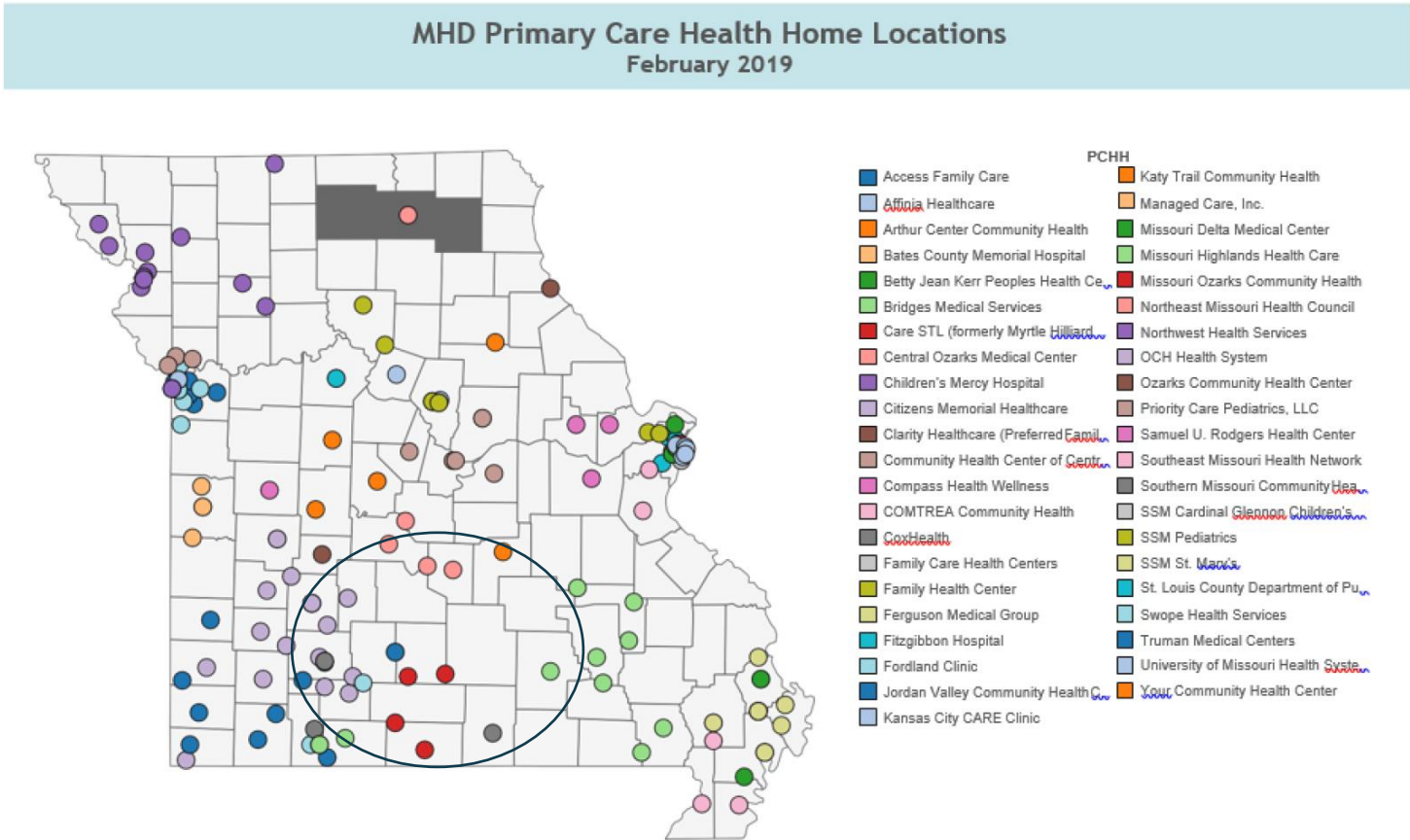


Missouri Department of Health and Senior Services, Rural Health



There are Primary Care Health Home providers in the South Central CACE Hub Area (Figure 12). Local Public Health Agencies are also located throughout the South Central Hub.

Figure 12



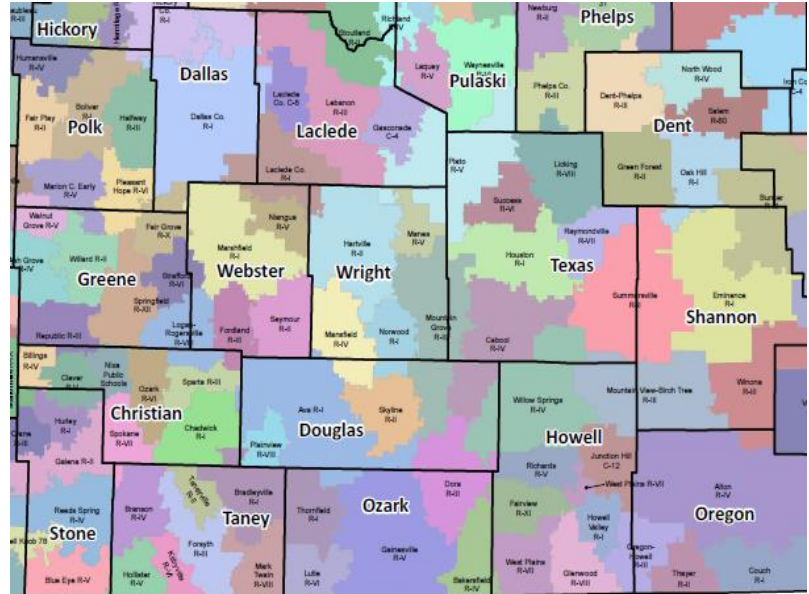
Missouri Department of Social Services. Missouri Primary Care Health Home Initiative. 2019.



Schools

Figure 13

South Central CACE Hub school districts, Missouri



There are 61 school districts in the South Central CACE Hub 12-county area (Figure 13).¹⁰ These students are located in elementary, middle and high schools as well as preschools and technical, career, and learning centers. Combined, the South Central CACE Hub has more than 58,000 total students (Table 4), representing approximately 7% of the current enrollment in public schools in Missouri.¹¹

Table 4

South Central CACE Hub School Districts by Number of Students, Missouri

Districts		Number	Percent of Total
County	12-county Area	58,922	100.0
Christian	Nixa Public Schools	6,396	10.9
Christian	Ozark R-VI	5,811	9.9
Taney	Branson R-IV	4,647	7.9
Laclede	Lebanon R-III	4,461	7.6
Webster	Marshfield R-I	2,997	5.1
Polk	Bolivar R_I	2,779	4.7
Howell	West Plains R-VII	2,631	4.5
Dallas	Dallas County R-I	1,702	2.9
Wright	Mountain Grove R-III	1,560	2.6
Taney	Hollister R-V	1,376	2.3
Douglas	Ava R-I	1,372	2.3
Christian	Clever R-V	1,286	2.2
Howell	Willow Springs R-IV	1,260	2.1
Howell	Mountain View – Birch Tree R-III	1,254	2.1
Taney	Forsyth R-III	1,204	2.0
Texas	Houston R-I	1,014	1.7
Texas	Licking R-VIII	797	1.4
Laclede	Laclede County R-I	773	1.3
Christian	Sparta R-III	745	1.3
Polk	Pleasant Hope R-VI	737	1.3
Webster	Seymour R-II	708	1.2
Texas	Cabool R-IV	703	1.2
Christian	Spokane R-VII	693	1.2
Wright	Hartville R-II	685	1.2
Oregon	Thayer R-II	674	1.1
Wright	Mansfield R-IV	637	1.1
Ozark	Gainesville R-V	626	1.1
	All other Districts	9,394	15.9

27 school districts have 84% of the total South Central Hub public school student population

Missouri Department of Elementary and Secondary Education. School Directory April 22, 2022.

Churches

There is an abundance of churches in the South Central CACE Hub Area including Baptist, Catholic, Christian, Methodist, and many others. The location of many of the churches may be found through online search portals such as [Church Finder](#) and [Catholic Charities of Southern Missouri](#). Faith-based asthma control initiatives and partnerships have the potential for a broad health impact, ranging from the individual to the community and have shown promise in improving asthma control.

The combined impact of simultaneously supporting clinicians, school nurses, and care managers while implementing effective interventions and linking with community resources (i.e., schools, churches, pharmacies, etc.) in areas with known asthma burden will likely have substantial impact and significantly improve population-level asthma control.

Acknowledgment

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