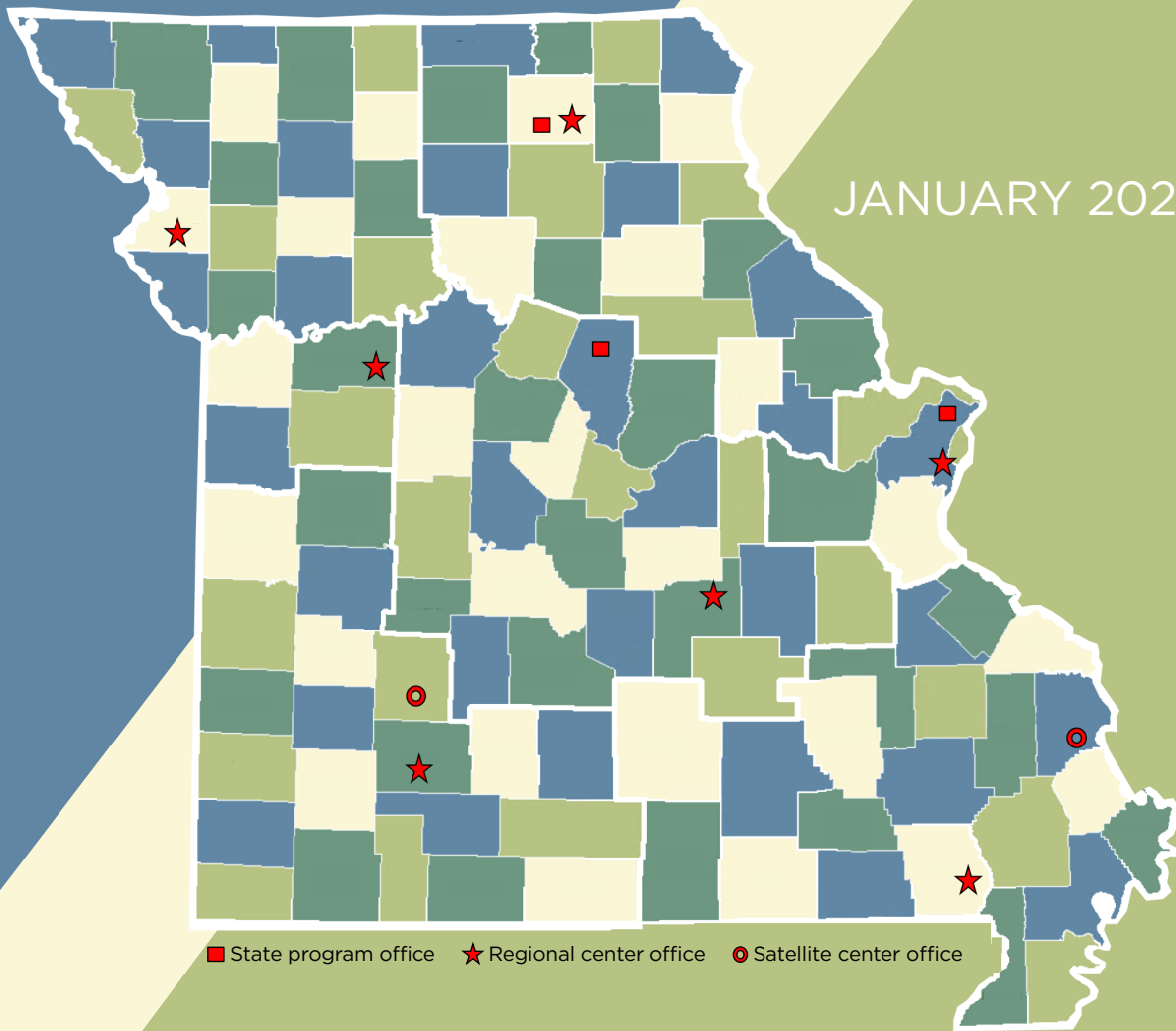


Missouri Area Health Education Centers Needs Assessment and Gap Analysis



By the University of Missouri Center for Health Policy and Missouri AHEC Program Office
at A.T. Still University-Kirksville College of Osteopathic Medicine



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Introduction

During Fall 2020, the Missouri Area Health Education Centers (MAHEC) began meeting with the University of Missouri Center for Health Policy (CHP) to develop a needs assessment. The purpose of the needs assessment is to scan Missouri's health care landscape, focusing on population health needs as well as health care workforce and infrastructure. The resulting report provides an analysis of two sides of Missouri's health care system, identifying gaps between health needs and health services available in the state, as well as MAHEC current efforts to address these gaps.

By better understanding the current gaps between needs and services, this report will inform MAHEC's application for funding from the US Department of Health and Human Services Health Resources & Services Administration Area Health Education Centers Program in April 2022.

The analysis of population health in Missouri focuses on the social determinants of health, and indicates that Missouri's health disparities are largely influenced by geography (i.e. rural and urban) and socioeconomic indicators, particularly income, education and housing. Demographic factors like race and age also play an important role in Missouri, where people of color have higher rates of some chronic illnesses as well as poverty, food insecurity and housing insecurity, and the population is aging. Demand for health care services is likely to increase with changes to the Affordable Care Act that expand coverage as well as Missouri's recent Medicaid expansion.

Analysis of the supply of health care services is drawn from the Missouri Health Care Workforce Project (MHCWP), housed at CHP, as well as HRSA resources on workforce projections and provider shortages. The analysis focuses on primary care, oral health, and mental and behavioral health, as well as additional professions such as nursing, pharmacy, physical therapy, and community health workers. In general, the analysis finds shortages of health care providers throughout Missouri for each of the professions reviewed. With few exceptions, such as licensed practical nurses (LPNs), shortages are more acute in rural areas. Current MAHEC activities meant to ameliorate these shortages, including clinical training rotations and K-12 pipeline activities are summarized. Community Health Workers may provide an important bridge connecting the uninsured and newly insured to health care services in their communities.

Finally, the report provides an overview of health care infrastructure, including Federally Qualified Health Centers (FQHCs), Rural Health Clinics (RHCs), hospitals, long-term care facilities, along with a discussion of telehealth and broadband access in Missouri.

Any analysis of health care supply and demand in 2022 would be remiss to ignore the impact of the ongoing COVID-19 pandemic. While data sources always lag real-time conditions in health care, the impacts of the lag are more apparent during a pandemic. Health care supply and demand are changing quickly in unexpected ways. This report uses the most recent data available, but many sources, including the 2015-2019 ACS 5-year population estimates and the base years for HRSA workforce projections, predate the start of the pandemic. One exception are data from MHCWP, which utilize Missouri Division of Professional Registration data from December 2021.

Population Health in Missouri

Missouri underperforms in population health and has fewer health care services than needed. Missouri's population faces geographic, socioeconomic, and cultural obstacles that result in health disparities, particularly for rural counties. Despite six medical schools and nearly 1,000 medical graduates per year, Missouri struggles with physician shortages and maldistributions in rural and underserved areas. Shortages are due, in part, to the cap placed on the number of residencies within a state imposed by Congress; Missouri is capped at 725 residencies statewide.¹ In addition, the physician workforce is not reflective of the diversity of the overall population. Similar patterns exist for other health care professions, including those providing nursing, oral care, and mental and behavioral health care. Mindful of this, Missouri AHEC (MAHEC) seeks to enhance Missouri's workforce to fit the needs of the population for improved access to comprehensive and coordinated care. MAHEC has a long history of working to address these needs, and AHEC programming has made a positive impact on recruiting students into health professions, rural training opportunities, and provider education.

Population Demographics, Including Regional Challenges/Barriers

Rural Versus Urban Disparities and Unique Challenges

Missouri's population and health care workforce needs are both rural and urban. Social determinants of health (SDOH) (conditions in which people are born, live, learn, work, play, worship, and age, that affect a wide range of health, functioning, and quality-of-life outcomes and risks²) play a fundamental role in rural and urban population health, but their patterns are distinct, rates varied, and solutions must be tailored. Rural residents experience disparities in socioeconomic status, standard health markers, and geographic challenges at greater rates than their urban counterparts, except for specific high-need urban populations. Conversely, urban areas have more diverse populations and a higher number of people needing health care services. Table 1 summarizes Missouri's population demographics and subsets of rural and urban as defined by HRSA,³ utilizing 2015-2019 American Community Survey population estimates to account for small populations within some categories. Of Missouri's 115 counties (including St. Louis City, which functions as its own county), 13 are completely urban, 96 are completely rural and six contain both rural and urban Census tracts. Just over one-third of Missouri's population is rural (33.7%). Nearly two-thirds of Missouri's population (66.3%) live in urban areas.

¹ Nielsen, M., D'Agostino, D., & Gregory, P. (2017). Addressing rural health challenges head on. *Missouri medicine*, 114(5), 363. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6140198/>

² Social Determinants of Health. (n.d.) *Healthy People 2020*. Retrieved from <https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health>

³ Health Resources and Services Administration. (n.d.) *Defining Rural Population*. Retrieved from <https://www.hrsa.gov/rural-health/about-us/definition/index.html>

Table 1: Summary of Demographics by State, Urban, and Rural Counties⁴

Criterion	Missouri		MOE ⁵	Rural	% of MO	MOE	Urban	% of MO	MOE ⁵
Est. 2015-2019 Pop.	6,104,910		0.24%	2,055,390	33.67%	0.72%	4,049,520	66.33%	0.37%
Land Area (mi ²)	68,742			59,591	86.69%		9,150	13.31%	
Pop. Density/mi ²	89			34			443		
Counties ⁶	115			102			19		
Race/Ethnicity	Missouri	%	MOE	Rural	% of Rural	MOE	Urban	% of Urban	MOE
White	5,015,904	82.16%	0.27%	1,906,204	92.74%	0.72%	3,109,700	76.79%	0.44%
Black/Afr. American	701,334	11.49%	1.17%	60,716	2.95%	13.48%	640,618	15.82%	1.28%
Native American	27,084	0.44%	5.59%	13,020	0.63%	11.63%	14,064	0.35%	10.77%
Asian	120,654	1.98%	2.99%	13,664	0.66%	26.40%	106,990	2.64%	3.37%
Pacific Islander	8,231	0.13%	14.52%	2,507	0.12%	47.66%	5,724	0.14%	20.87%
Other	71,335	1.17%	5.17%	14,884	0.72%	24.80%	56,451	1.39%	6.54%
Multi-Racial	160,368	2.63%	2.60%	44,395	2.16%	9.38%	115,973	2.86%	3.59%
Hispanic/Latinx ⁷	254,791	4.17%	2.22%	71,321	3.47%	7.92%	183,470	4.53%	3.08%
Age Cohorts	Missouri	%	MOE	Rural	% of Rural	MOE	Urban	% of Urban	MOE
Children (<18)	1,381,612	22.63%	0.60%	466,198	22.68%	1.78%	915,414	22.61%	0.91%
Seniors (65+)	1,006,725	16.49%	0.47%	382,257	18.60%	1.24%	624,468	15.42%	0.76%
SDOH	Missouri	%	MOE	Rural	% of Rural	MOE	Urban	% of Urban	MOE
Persons in Poverty ⁸	810,045	13.68%	1.29%	330,838	16.81%	3.15%	479,207	12.12%	2.18%
Children in Poverty	252,071	18.65%	1.72%	105,296	23.21%	4.12%	146,775	16.35%	2.95%
HS Graduate + (>24)	3,731,783	89.92%	0.35%	1,201,893	85.91%	1.09%	2,529,890	91.96%	0.52%
Bachelor Deg + (>24)	1,212,562	29.22%	0.60%	243,674	17.42%	2.99%	968,888	35.22%	0.75%
No Health Ins. (<65)	555,130	10.89%	1.19%	230,380	13.77%	2.88%	324,750	9.48%	2.04%
Disability (<65)	518,371	10.17%	0.74%	210,870	12.60%	1.81%	307,501	8.98%	1.26%
Cost Burdened Households	616,342	26.37%	0.91%	181,285	24.14%	3.09%	435,057	27.43%	1.29%
Households w/o Vehicle	165,906	6.87%	1.68%	47,735	6.07%	5.83%	118,171	7.26%	2.35%

⁴ Missouri Census Data Center. (2021). *ACS Profiles* [dataset application]. Retrieved from <https://mcdc.missouri.edu/applications/acs/profiles/>.

⁵ MOE: Margin of error.

⁶ Six Missouri counties contained both urban and rural census tracts, therefore the number of urban and the number of rural counties in this row total more than 115.

⁷ Includes Hispanic or Latinx of any race.

⁸ Denominator includes persons for whom poverty status is determined.

Socioeconomic Challenges

Socioeconomic factors affect health—those with less education and lower incomes often experience poor health outcomes. Life expectancy for adults without a bachelor’s degree decreased nationally from 2011 to 2018⁹—a fact that is significant for the 83% of Missouri residents in rural areas and 65% in urban areas who lack a bachelor’s degree. Also concerning are the 14% of rural and eight percent of urban Missourians without a high school diploma.¹⁰ Poverty is also associated with premature mortality and increased morbidity. In general, those in poorer communities have shorter lives.¹¹ Missouri’s high rate of poverty is even higher among rural residents. In rural areas, 16% of the population lives in poverty compared to 12% in urban areas. The rates are even greater for rural children—23% of whom live in poverty in Missouri.¹² A higher rate of rural residents die from diseases such as heart disease, possibly due to socioeconomic inequalities along with lack of access to primary care and hospital treatment for these diseases.¹³ Missouri counties with the highest poverty rates have a high prevalence of diabetes and other poor health outcomes measures.¹⁴ Table 2 below includes the ten counties with the highest poverty rates in Missouri. All ten counties are rural and all but one are in the MAHEC Southeastern and Southwest regions.

Table 2. Ten Missouri Counties with Highest Poverty Rates¹⁵

County	AHEC Region	Individuals living in Poverty	Poverty Rate	MOE ¹⁶
Ozark	Southwest	2,686	29.57%	13.48%
Shannon	Southeastern	2,217	27.45%	16.78%
Pemiscot	Southeastern	4,480	27.39%	10.51%
Dunklin	Southeastern	7,505	25.70%	9.11%
Ripley	Southeastern	3,406	25.39%	15.68%
Texas	Southeastern	6,111	25.32%	14.33%
Mississippi	Southeastern	2,985	25.27%	16.55%
Wright	Southwest	4,339	24.24%	15.63%
Wayne	Southeastern	3,115	24.14%	15.67%
Adair	Northeast	5,421	23.82%	12.78%

⁹ Missouri Department of Health and Senior Services. (n.d.) *Health in Rural Missouri, Biennial Report 2020-2021*. Retrieved from <https://health.mo.gov/living/families/ruralhealth/pdf/biennial2020.pdf>.

¹⁰ Ibid 4.

¹¹ Missouri Community Action Network and Missourians to End Poverty. (n.d.) *Missouri Poverty Report 2020*. Retrieved from https://www.caastlc.org/wpsite/wp-content/uploads/2020/06/PovertyReport_2020-reduced-size.pdf.

¹² Ibid 4.

¹³ Ibid 9.

¹⁴ Ibid 11.

¹⁵ U.S. Census Bureau. (n.d.) *American Community Survey, 5-Year Estimates Detailed Tables, 2015-2019, Table B17001*. (December 2021). Retrieved from <https://data.census.gov/cedsci/>.

¹⁶ MOE: Margin of error

Additional health care access barriers tied to socioeconomic challenges include a lack of transportation and health insurance as well as housing and food insecurity. More than one in four (26%) Missouri households are housing cost burdened, with rent or mortgage and utilities accounting for more than 30% of the household income. While housing costs are often lower in rural areas than urban, so are incomes, resulting in relatively similar rates of housing cost burden in urban (27%) and rural (24%) households. Missouri has the 17th highest food insecurity rate in the nation,¹⁷ and rates are higher among Missouri's residents of color.¹⁸ Food insecure families are at a higher risk for weight gain and chronic disease, e.g., diabetes, hypertension.¹⁹ Food insecurity is also associated with psychological distress, anxiety, and depression among low-income women and children.²⁰ These physical and mental health effects are especially detrimental when there is the lack of access to proper medical care.²¹ In rural areas, individuals may drive 60+ miles to reach appropriate care. The distance in urban areas is less, but for those who are unwell and do not own a vehicle, transportation challenges are also difficult to overcome. More than 6% of rural Missouri households lack access to a vehicle.²² Further, 11% of Missourians lack health insurance, including 14% in rural counties and 9% in urban counties,²³ which impedes the ability of low-income individuals to access primary and preventive care. In a state where almost half of the population is unvaccinated from COVID-19²⁴ and nearly 27% of children have not received all recommended non-COVID vaccinations,²⁵ addressing these factors can make a real difference.

Aging Population

The US is experiencing massive growth in its senior population. Missouri's population of adults age 65+ has grown to more than one million (16% of the total population), a 20% increase since 2010. While a higher number of seniors live in urban areas (624,468), they represent a greater percentage of the population in rural areas (19%). An aging population affects the health sector in key ways: 1) retiring health professionals intensify workforce shortages²⁶ and 2) aging increases health care needs, thereby surging the demand for health professionals.

¹⁷ US Department of Agriculture Economic Research Service. (n.d.) *Key Statistics and Graphics*. Retrieved from <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/key-statistics-graphics.aspx>.

¹⁸ Calender, C. Barker, R. (editor). (December 2015). *Health Equity Series: Food Insecurity*. Missouri Foundation for Health. Retrieved from <http://mffh.org/wp-content/uploads/2016/04/Health-Equity-Series-Food-Insecurity.pdf>.

¹⁹ Liu Y., Njai R., Greenlund K., Chapman D., Croft J. Relationships Between Housing and Food Insecurity, Frequent Mental Distress, and Insufficient Sleep Among Adults in 12 US States, 2009. (nd.) *Preventing Chronic Disease*. 2014. Retrieved from <http://doi:10.5888/pcd11.130334>.

²⁰ Ibid 18.

²¹ Ibid 18.

²² Ibid 4.

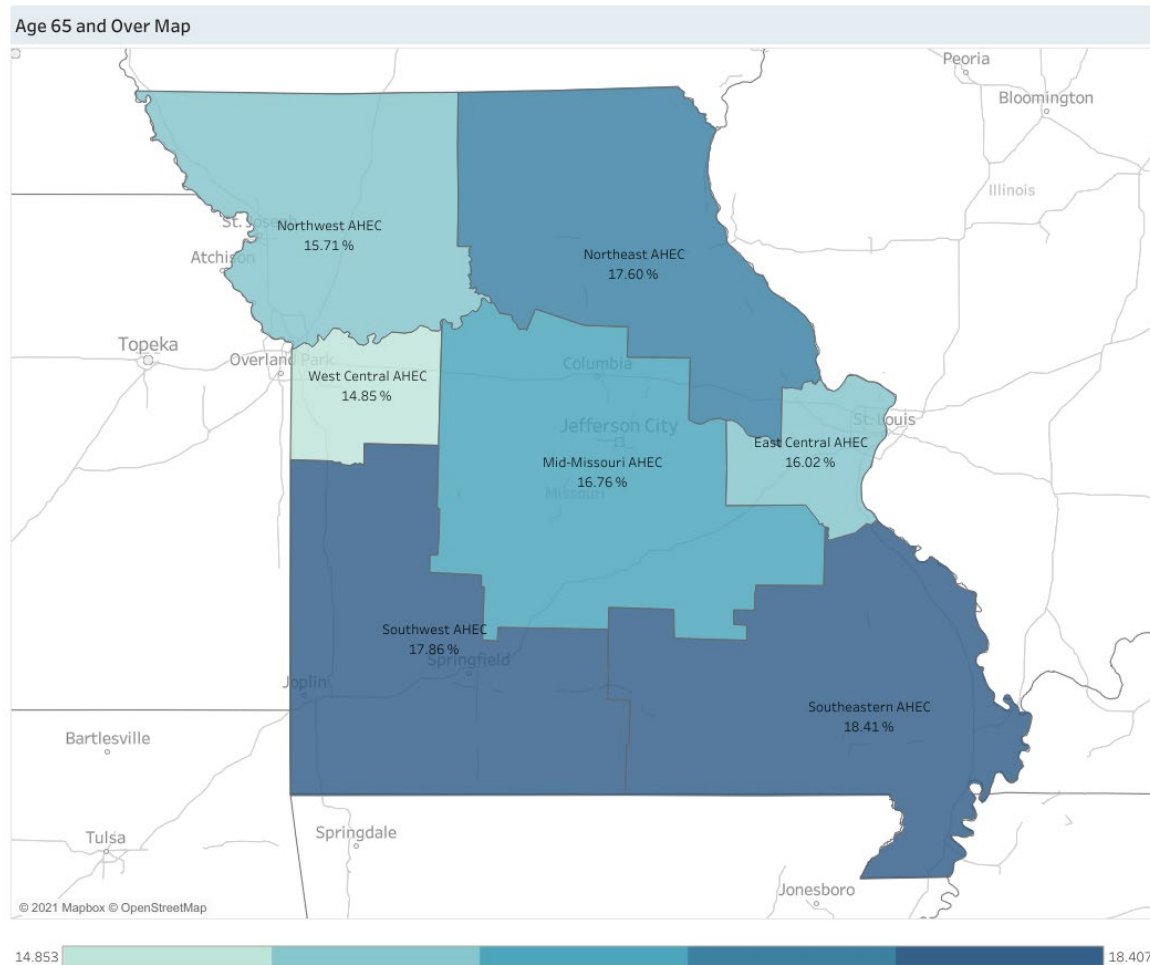
²³ Ibid 4.

²⁴ Missouri Department of Health and Senior Services. (n.d.) *Public Health – Vaccines Statewide*. Retrieved from <https://health.mo.gov/living/healthcondiseases/communicable/novel-coronavirus/data/public-health/vaccine.php>.

²⁵ KFF. (n.d.) *Percent of Children Aged 0-35 Months Who Are Immunized*. Retrieved from <https://www.kff.org/other/state-indicator/percent-of-children-aged-0-35-months-who-are-immunized>.

²⁶ Bolin J.N., Bellamy G.R., Ferdinand A.O., Vuong A.M., Kash B.A., Schulze A., Helduser J.W. (2015, Summer). *Rural Healthy People 2020*. Retrieved from: *New Decade, Same Challenges*. Journal of Rural Health. 31(3):326-33. doi: 10.1111/jrh.12116.

Figure 2: Percent Population Age 65 and Older by AHEC Region



Demand for Culturally Competent and Diverse Workforce

More than 82% of Missourians identify as white and more than 95% identify as non-Hispanic or Latinx, making the state less diverse in these respects than national averages.²⁷ Some minority populations are growing in Missouri. Since 2010, the Hispanic or Latinx population has grown 20%, and the Asian population has grown by 23%.¹⁶ As minority populations grow, the need for culturally competent health care also increases. At least 6% of the population speaks a language other than English at home.¹⁶

Health needs vary among demographic groups, largely due to disparities related to the social determinants of health. For example, poverty²⁸ and food insecurity rates²⁹ are higher for

²⁷ Ibid 4.

²⁸ KFF. (n.d.) *KFF estimates based on the Census Bureau's March Current Population Survey (CPS: Annual Social and Economic Supplements), 2017-2021*. Retrieved from <https://www.kff.org/other/state-indicator/poverty-rate-by-race-ethnicity-cps/>.

²⁹ Njenga, S., Herman-Nestor, A., Sisco, D. & Alvarez, L. (2020, March). *Integrating Social Determinants of Health in Care Delivery. Trajectories*. Retrieved from https://www.mhanet.com/mhaimages/SOI/Trajectories/Trajectories_March2020_SDOH.pdf.

Missourians of color. Non-white households in Missouri, particularly those with Black or African American or Hispanic or Latinx householders, have higher rates of housing cost burden and lower home ownership rates.³⁰ Asthma, cancer, diabetes, arthritis, and heart disease all affect Black Missourians at a higher rate than white Missourians.³¹ According to the Missouri Hospital Association’s Health Equity Dashboard, white Missourians in the state more frequently seek treatment for behavior disorders and are more likely to misuse prescribed opioids. Hispanic or Latinx and Black Missourians are more likely to be uninsured or enrolled in Medicaid than their white counterparts.³² In 2016, 19.1% of the state’s white population self-reported fair to poor general health status compared to 25.3% of Missourians who are Black.³³

The lesbian, gay, bisexual, transgender, and queer (LGBTQ+) community face stigma, systematic discrimination, and differential access to health insurance, which combined with a lack of culturally competent care results in poor health outcomes. The physical and mental health of LGBTQ+ individuals is compromised when economic and social influences lead to social isolation, psychological distress, anxiety, depression, low self-esteem, and the ailments tied to poor mental health status.³⁴ Many LGBTQ+ individuals do not receive the care they require—an issue that is particularly difficult for transgender people, especially given that the majority of health insurers, including Medicaid, Medicare, and Veteran plans do not cover transgender-specific care. Missouri explicitly excludes transition care from Medicaid benefits.³⁵ Data on the LGBTQ+ community are emerging. The Census Bureau began collecting information on sexual orientation and gender identity through their Household Pulse Survey in July 2021, and estimates 6.9% (+/- 0.9%) of Missourians identify as LGBT.³⁶

Missouri’s racial/ethnic minority and LGBTQ+ health disparities must be addressed by a workforce that reflects the population, a training focus in cultural proficiency for all health care trainees, and the addition of minority specific services as a part of practice transformation.

³⁰ Ibid 29.

³¹ Missouri Department of Health and Senior Services. (2011-2015) *DHSS-MOPHIMS Community Data Profiles – Chronic Disease Comparisons*. Retrieved from <https://health.mo.gov/data/index.php>.

³² Missouri Hospital Association. (n.d.) *MHA Health Equity Dashboards*. Retrieved from <https://web.mhanet.com/health-equity-dashboards/>.

³³ Ibid 31.

³⁴ United States Department of Health and Human Services. (n.d.) *Lesbian, Gay, Bisexual, and Transgender Health. Healthy People 2020*. Retrieved from <https://www.healthypeople.gov/2020/topics-objectives/topic/lesbian-gay-bisexual-and-transgender-health>.

³⁵ MO HealthNet. (2021, October 13) *State of Missouri MO HealthNet Physicians Manual*. Retrieved from http://manuals.momed.com/collections/collection_phy/print.pdf.

³⁶ Anderson, L., File, T., Marshall, J., McElrath, K., Scherer, Z. (2021). New Household Pulse Survey Data Reveals Differences between LGBT and Non-LGBT Respondents During COVID-19 Pandemic. Retrieved from <https://www.census.gov/library/stories/2021/11/census-bureau-survey-explores-sexual-orientation-and-gender-identity.html>.

Medicaid Expansion

Starting July 1, 2021, all Missourians aged 19 to 64 earning up to 138% of the federal poverty level became eligible for Medicaid.³⁷ Missouri began processing applications on October 1, 2021.³⁸ Prior to expansion, just over one million Missourians (n=1,029,000) were enrolled in the MO HealthNet program.³⁹

Observations of Medicaid expansion in other states offer guidance for Missouri, preparing regional health care systems to support new enrollees and to proactively plan for the future. Washington University CHEP estimates indicate that more than three out of five new enrollees (61.9%) will have been previously uninsured, and three out of ten (29.3%) will be transferring to Medicaid from private/non-group insurance. Among the expected new enrollees will be a greater proportion of young adults ages 18-24 (27.5% compared to 17.8% of current enrollees). About half of new Medicaid recipients (52%) will be under the age of 35, and more than half never married (54.4%). More than two-thirds of new adult enrollees will not be parents (68.1%) and will live in families with no children (65.4%).⁴⁰

New Medicaid expansion enrollees in Missouri will likely be disproportionately non-Hispanic white (79.7%). New enrollees are estimated to be more likely to live in rural areas (41%) than the rest of Missouri's population (34%). Enrollees are projected to have a higher level of educational attainment than those currently receiving Medicaid.⁴¹

Because income levels covered by Medicaid expansion are much higher than most of Missouri's existing Medicaid-eligible populations, new adult enrollees are more likely to be employed with income above 75% of the federal poverty level than current enrollees. Those with income 100-138% of federal poverty level (31.3%) are expected to comprise the largest income group of new enrollees. However, a higher percentage of new enrollees are also expected to be very low-income individuals, with 27.2% expected to be less than the 25% federal poverty level compared to 17.4% of current enrollees.

Washington University Center for Health Economics and Policy (CHEP) estimates 275,000 Missourians are eligible to enroll through Medicaid expansion. Within Missouri's seven AHEC regions, CHEP estimates that eligibility for expansion ranges from 2.9% to 5.3% of each region's total population.⁴² Highest enrollments are expected in southern portions of

³⁷ HHS Press Office. (2021). *Missouri Medicaid Expansion Brings Quality Essential Health Coverage to More than 275,000 Missourians*. Retrieved from <https://www.hhs.gov/about/news/2021/10/04/missouri-medicaid-expansion-brings-quality-essential-health-coverage.html>.

³⁸ Norris, L. (2021). *Missouri and the ACA's Medicaid Expansion*. Retrieved from <https://www.healthinsurance.org/medicaid/missouri/>.

³⁹ Missouri Foundation for Health. (2021). *Medicaid expansion enrollment and eligibility update: Characteristics of expansion enrollees*. Retrieved from https://cpb-us-w2.wpmucdn.com/sites.wustl.edu/dist/1/2391/files/2020/04/FactSheet_NewEnrolleeDemographics_final.pdf.

⁴⁰ Ibid 39.

⁴¹ Ibid 39.

⁴² Hernandez, E. (2019). *Estimated new enrollees as percent of county population*. Retrieved from <https://public.tableau.com/app/profile/emily.hernandez6106/viz/DRAFTv2-EstimatedMedicaidEnrolleesbyCounty2019Data/PercentofEnrollees>.

the state. Southwest AHEC region is expected to have the highest enrollment increase at 5.3%, with an estimated 51,343 residents to enroll in the 21-county area, followed by the Southeastern AHEC region (5.1%; 26,989 residents). Mid-Missouri (4.8%), Northeast (4.4%) and West Central (4.3%) regions are projected to enroll slightly more residents than the state average (4.0%), while Northwest AHEC counties are expected to enroll less (3.3%).

East Central AHEC region has the lowest projected enrollment at 2.9%, but the largest number of estimated regional enrollees with 58,829. Some residents within the East Central region are currently eligible for the Gateway to Better Health program, which offers low-income participants from St. Louis County and St. Louis City coverage for primary care, limited dental, urgent care visits, non-emergency transportation, prescriptions and substance abuse treatment.⁴³ Medicaid expansion will provide additional insurance coverage to this population, including emergency and hospital care.

Table 3: Medicaid Expansion Estimates by AHEC Region

AHEC Region	Percent of Region's Population to Enroll (%)	Regional Enrollee Estimate (#)	Regional Population Estimate (#)
East Central	2.9%	58,829	2,025,851
Mid-Missouri	4.8%	37,340	783,453
Northeast	4.4%	14,403	328,749
Northwest	3.3%	20,276	618,639
Southeastern	5.1%	26,989	525,060
Southwest	5.3%	51,343	960,115
West Central	4.3%	38,818	895,561
Total	4.0%	247,498	6,137,428

Medically Underserved Areas/Populations (MUA/Ps)

Introduction

Missouri's specific population health needs are addressed through a number of federal health care and health care workforce initiatives. Medically Underserved Areas/Populations (MUA/Ps) are areas or populations which HRSA designates as having a shortage of primary care providers, high incidence of infant mortality, high poverty or a concentration of older adult residents.⁴⁴ Programs like the Health Center Program and CMS Rural Health Clinic Program utilize MUA/Ps to allocate federal resources to areas of greatest need.

⁴³ Gateway to Better Health. (2021). Retrieved from <https://stlgbh.com/programoverview>.

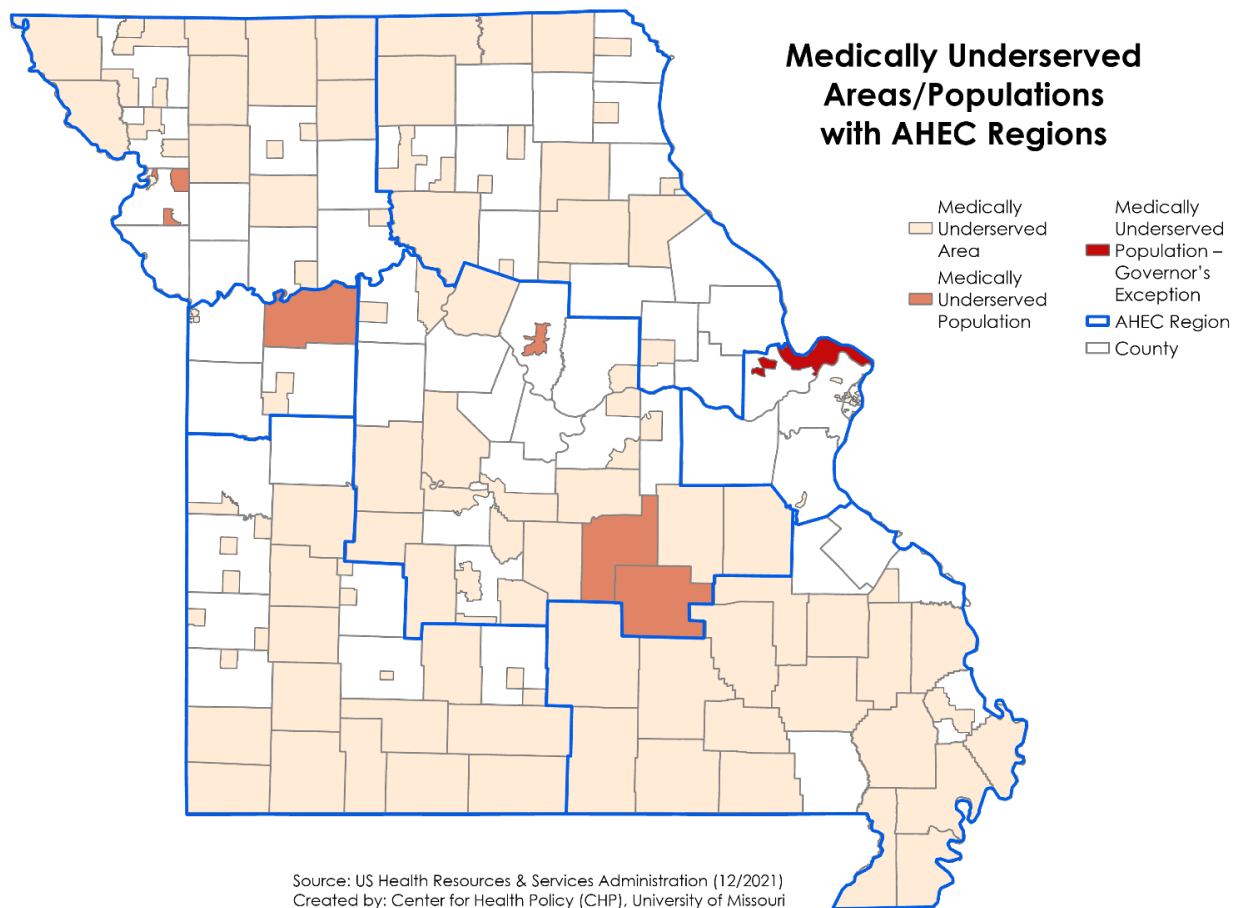
⁴⁴ Health Resources and Services Administration. (2021). *What is a shortage designation?* Retrieved from <https://bhwr.hrsa.gov/workforce-shortage-areas/shortage-designation>.

Table 4: Medically Underserved Areas/Populations (MUA/P) in Missouri⁴⁵

MUA/P Type	Rural	Partially Rural	Urban	Total
Governor-designated - all or partially in the area	0	0	2	2
MUA - all or partially in the area	81	5	29	115
MUP - all or partially in the area	2	1	2	5
Total Missouri MUA/Ps	83	6	33	122

Medically Underserved Areas have been designated in all seven Missouri AHEC regions, clustering in the northern and southern parts of the state and most prevalent along the state’s borders. Three AHEC regions (Northwest, West Central, and Mid-Missouri) have Medically Underserved Populations which include three entire counties (Lafayette, Dent, and Phelps) and portions of two other counties (Buchanan and Boone). The East Central region has two Medically Underserved Populations in St. Charles County identified by the state’s governor as having a provider shortage (Governor’s Exception).

Figure 3: Medically Underserved Areas/Populations (MUA/Ps)



⁴⁵ Health Resources and Services Administration. (2021). *MUA Find*. Retrieved from <https://data.hrsa.gov/tools/shortage-area/mua-find>.

Figure 4 displays regional distribution and rates of Federally Qualified Health Centers per 100,000 population for AHEC regions. Southeastern (6.81) and Northeast (5.52) regions have higher rates than other regions, providing much needed health care. East Central (1.88) and West Central (2.60) have comparably fewer FQHCs for their population bases. Driving distances to centers are a factor throughout rural regions, across the northernmost part of the state and in numerous pockets of the Mid-Missouri, Southwest, and Southeastern regions. FQHCs are important safety net providers for primary care, and often dental and mental and behavioral health.

Figure 4: Federally Qualified Health Centers (FHQCs) per 100,000 Population

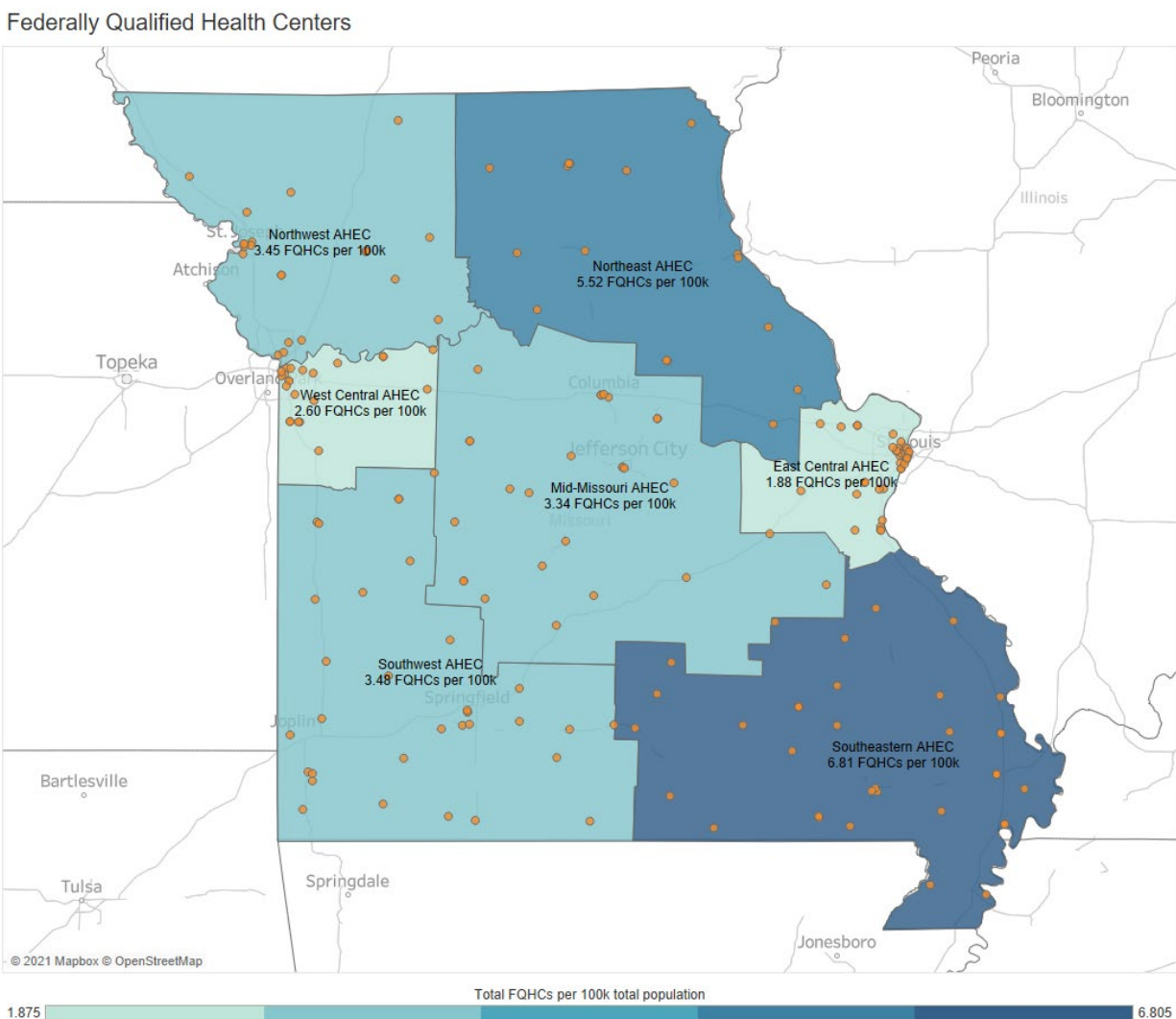
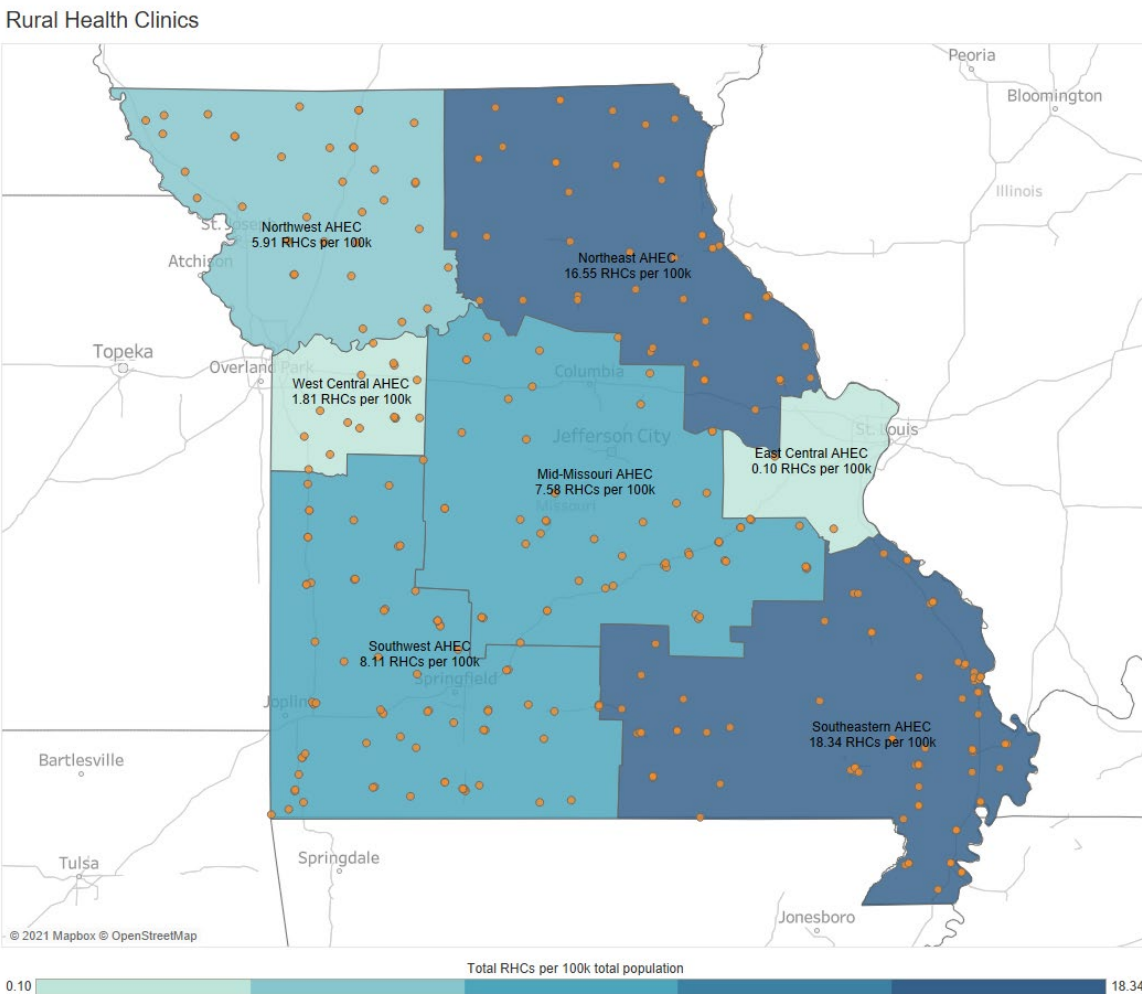


Figure 5 displays Rural Health Clinics and rates of clinics per 100,000 population in each region. Like FQHCs, RHC rates in the Southeastern (18.34) and Northeast (16.55) regions are higher than in other parts of the state. East Central (1.81) and West Central (0.10) regions, home to St. Louis and Kansas City, respectively, have the fewest RHCs for their population bases. Rural Health Clinics fill important gaps in primary care, dental care, and mental and behavioral health in rural areas. However, the distribution of RHCs across the state reveal holes in access, most noticeably for residents living in the Southeastern region (i.e. Iron County High Need Geographic HPSA designation).

Figure 5: Rural Health Clinics (RHCs) per 100,000 Population



Missouri's Health Care Workforce Landscape

Analysis of Missouri's health care workforce is drawn from the Missouri Health Care Workforce Project (MHCWP), housed at the University of Missouri Center for Health Policy, as well as HRSA resources on workforce projections and provider shortages. HRSA provides projections of the supply and demand of health care professionals at state and national levels to help states plan for future health care needs. HRSA also designates Health Professional Shortage Areas (HPSAs) to address population health needs as well as health care shortages and maldistribution.

The analysis focuses on primary care, oral health, and mental and behavioral health, as well as additional professions such as nursing, pharmacy, physical therapy, and community health workers.

In general, the analysis finds shortages of health care providers throughout Missouri for each of the professions reviewed. With few exceptions, such as licensed practical nurses (LPNs), shortages are more acute in rural areas.

Primary Care

Importance

A high-quality primary care workforce providing sufficient statewide coverage is key to healthy individuals, families and communities. Primary care providers are on the front lines as the first source of non-emergency care. Through education to manage daily health, treatment for sickness, and linkages to specialized care, primary care providers help people live healthier lives and incur fewer medical costs over time.⁴⁶

Missouri's Primary Care Physician Workforce

Table 5 below summarizes the number of primary care physicians (PCPs) in Missouri by AHEC region according to the 2021 public release licensure data from the Missouri Division of Professional Registration. The Missouri Health Care Workforce Project⁴⁷ defines primary care specialties as family medicine, internal medicine, general practice, obstetrics and gynecology, and pediatrics. Providers are assigned to a county based on their address in the Missouri Division of Professional Registration licensure data. HRSA definitions of rural and urban, based on Census tracts, are used to categorize counties.⁴⁸ Partially rural counties include both urban and rural tracts.

The data show that there is a pattern of distribution of primary care providers that favors urban locations over rural. Distribution of available PCPs is skewed toward the more urban AHEC regions, Northwest, East Central, and West Central. The highest PCP to population ratios are

⁴⁶ Cleveland Clinic. (2021). *The importance of having a primary care doctor*. Retrieved from <https://my.clevelandclinic.org/health/articles/16507-the-importance-of-having-a-primary-care-doctor>.

⁴⁷ Missouri Health Care Workforce Project database. University of Missouri Center for Health Policy.

⁴⁸ Ibid 3.

found in the most rural AHECs: Northeast with 1 PCP for every 1,279 residents and Southeastern with 1 PCP for every 1,197 residents. However, Table 5 provides the ratios of primary care to AHEC region population and there is evidence of primary care physician shortages throughout the state.

Table 5: Number and Percent of Rural, Partially Rural, and Urban Primary Care Physicians by AHEC Region

AHEC Region	Rural # (%)	Partially Rural # (%)	Urban # (%)	Total Primary Care	Total Population	Ratio Primary Care to Population
East Central	97 (2%)	0 (0%)	4,428 (98%)	4,525	2,026,525	1 to 448
Mid-Missouri	246 (25%)	581 (60%)	141 (15%)	968	778,698	1 to 804
Northeast	255 (100%)	0 (0%)	0 (0%)	255	326,208	1 to 1,279
Northwest	81 (11%)	0 (0%)	624 (89%)	705	609,093	1 to 864
Southeastern	264 (60%)	0 (0%)	178 (40%)	442	529,002	1 to 1,197
Southwest	258 (23%)	256 (23%)	600 (54%)	1,114	949,292	1 to 852
West Central	23 (1%)	10 (1%)	1,782 (98%)	1,815	886,092	1 to 488
State	1,224	847	7,753	9,824	6,104,910	1 to 621

There are several supply-related influences on the adequacy of primary care workforce. Of particular interest are the effects of COVID-19 on primary care workforce supply in Missouri. Results of a 2020 Missouri Hospital Association survey found increased vacancies and turnover rates across most health care positions surveyed, including an all-time high turnover rate of 21.5%. While the survey was among hospital systems, high turnover rates are likely happening in primary care settings as well.⁴⁹ Among Missouri's top 10 hospital professions with the highest employee vacancy rates were positions also found in primary care settings, including Licensed Practical Nurses (LPNs) (17%), Nurses Assistants (15%), and Staff Registered Nurses (12%). Nurses Assistants (36.9%) and LPNs (21.4%) also were among the state's top 10 hospital professions with the highest employee turnover during 2020. Registered nurse vacancies (12%) and turnover (18.1%) were also noteworthy results during 2020. Staff nurse numbers grew 2%, and at 35,735 nurses and 4,894 vacancies, were the highest annual figures in 20 years. For more information on the MHA survey results, visit <https://web.mhanet.com/media-library/2021-workforce-report/>.

⁴⁹ Williams, J. (2021). 2021 *Workforce Report*. Missouri Hospital Association. Retrieved from https://www.mhanet.com/mhaimages/Workforce/2021/2021_WF_report.pdf.

Additional influences on the supply of primary care include aging in the health care workforce, the expanding role of Advanced Practice Registered Nurses (APRNs) in providing care, the evolution of various care delivery models including telehealth, and the impact of Affordable Care Act on individuals with health insurance, including the newly implemented Medicaid expansion in Missouri.⁵⁰

According to the Association of American Medical Colleges, 68% of physicians who finish all training within one state remain to practice in that state.⁵¹ However, in Missouri only 21.5% of students graduating medical school remain in the state.⁵² Limited residency slots have not kept pace with medical school enrollments, creating a bottleneck in the pipeline of medical students to practicing providers.

HRSA Primary Care Workforce Projections

HRSA has a slightly different definition of the primary care workforce, including physicians, physician assistants (PAs), and nurse practitioners (NPs) who practice in primary care specialties: family medicine, general pediatric medicine, general internal medicine, and geriatric medicine. The primary care workforce does not include hospital-based physicians.⁵³

HRSA primary care workforce projections are based on modeling of workforce supply and demand for each health profession category. While projections can be useful tools for planning, it's important to remember that these are estimates based on data from 2018, well before the COVID-19 pandemic and its implications for the health care workforce supply as well as health care demand. In primary care specifically, the pandemic has had a profound impact on the supply and demand for nurse practitioners.

Supply modeling includes estimating number and characteristics of current supply, number and characteristics of entrants, workforce attrition (mortality, retirement, or career change), and workforce participation behaviors including work hour patterns and state-level migration. Demand modeling includes estimating demand for services with methods specific to each discipline. For example, primary care demand is based on population data and utilization patterns for hospital, ambulatory, and post-acute/long-term institutional care; and other employment settings serving specific populations -- public, school clinic, academia, criminal justice system, and others.⁵⁴

⁵⁰ Becker, M. (2018). *Primary Care Physicians — Missouri Workforce Update*. <https://web.mhanet.com/media-library/2018-primary-care-physicians-missouri-workforce-update/>

⁵¹ *National Residency Matching Program, Results and Data: 2018 Main Residency Match*®. (2018, April). Retrieved from <http://www.nrmp.org/wp-content/uploads/2018/04/Main-Match-Result-and-Data-2018.pdf>.

Becker, M. (2018). *Primary Care Physicians — Missouri Workforce Update*. <https://web.mhanet.com/media-library/2018-primary-care-physicians-missouri-workforce-update/>.

⁵² Ibid 50.

⁵³ Health Resources and Services Administration. (2021). *Workforce projections*. Retrieved from <https://data.hrsa.gov/topics/health-workforce/workforce-projections>.

⁵⁴ Health Resources and Services Administration. (2021). *Technical documentation for health resources and services administration's health workforce simulation model*. Retrieved from https://bhw.hrsa.gov/sites/default/files/bureau-health-workforce/data-research/technical-documentation-health-workforce-simulation-model_092921.pdf.

Supply and Demand

HRSA projects changes in the U.S. and Missouri primary care workforce supply and demand between 2018 and 2030. Table 6 below highlights changes in supply and demand across primary care workforce categories, followed by a discussion of adequacy rates for areas where Missouri's workforce differs from national estimates.

Table 6: U.S. and Missouri Primary Care Workforce Supply and Demand

Primary Care Category	MO US	2018 supply (#)	2018 demand (#)	2018 adequacy rate (%)	2030 supply (% change)	2030 demand (% change)	2030 adequacy rate (%)
Family Medicine	MO	1,950	2,240	87%	2,010 (3%)	2,310 (3%)	87%
	US	105,400	113,840	93%	111,720 (6%)	128,640 (13%)	87%
General internal	MO	1,310	1,670	78%	1,380 (5%)	1,830 (10%)	75%
	US	81,760	90,180	91%	92,390 (13%)	110,020 (22%)	84%
Geriatric ⁵⁵	MO	-	-	-	-	-	-
	US	8,220	8,220	100%	7,610 (-7%)	12,330 (50%)	61%
Pediatric	MO	1,150	1,120	103%	1,250 (9%)	1,080 (-4%)	116%
	US	60,840	60,840	100%	62,060 (2%)	63,880 (5%)	97%
Nurse practitioner	MO	1,560	1,230	127%	3,200 (105%)	1,280 (4%)	250%
	US	64,490	64,490	100%	133,490 (107%)	74,810 (16%)	178%
Physician assistant	MO	250	650	38%	470 (88%)	670 (3%)	70%
	US	33,400	33,400	100%	47,430 (42%)	38,410 (15%)	123%
Total ⁵⁶	MO	6,220	6,910	90%	8,310 (34%)	7,160 (4%)	116%
	US	354,110	370,970	95%	454,700 (28%)	428,090 (15%)	106%

United States

In 2018, the United States had approximately 256,220 full-time equivalent (FTE) primary care providers.⁵⁷ This included:

- 105,400 FTE family physicians (projected demand was 113,840)
- 81,760 FTE general internal physicians (projected demand was 90,180)
- 8,220 FTE geriatric physicians (same as projected demand)
- 60,840 FTE pediatric physicians (same as projected demand)
- 64,490 FTE primary care nurse practitioners (same as projected demand)
- 33,400 FTE primary care physician assistants (same as projected demand)

⁵⁵ HRSA workforce projections do not include geriatric physician data for Missouri.

⁵⁶ Total includes physicians, nurse practitioners, and physician assistants providing primary care.

⁵⁷ Health Resources and Services Administration. (2021). *Primary care workforce projections*. Retrieved from <https://bh.w.hrsa.gov/data-research/projecting-health-workforce-supply-demand/primary-health>

By 2030, the projected changes in U.S. supply of and demand for primary care service providers include:

- Family physicians – 6% increase in supply, 13% increase in demand
- General internal physicians – 13% increase in supply, 22% increase in demand
- Geriatric physicians – 8% decrease in supply, 50% increase in demand
- Pediatric physicians – 2% increase in supply, 5% increase in demand
- Nurse practitioners in primary care – 107% increase in supply, 16% increase in demand
- Physician assistants in primary care – 42% increase in supply, 15% increase in demand

Missouri

In 2018, Missouri had approximately 6,220 total primary care providers,⁵⁸ including:⁵⁹

- 1,950 FTE family physicians (projected demand was 2,240)
- 1,310 FTE general internal physicians (projected demand was 1,670)
- 1,150 FTE pediatric physicians (projected demand was 1,120)
- 1,560 FTE nurse practitioners in primary care (projected demand was 1,230)
- 250 FTE physician assistants in primary care for nurse practitioners and (projected demand was 650)

By 2030, projected changes in supply and demand for primary care service providers include:

- Approximately 8,310 total primary care physicians⁴⁵ in Missouri:
- Family physicians – 3.1% increase in supply, 2.7% increase in demand
- General internal physicians – 5.3% increase in supply, 9.6% increase in demand
- Pediatric physicians – 8.7% increase in supply, 3.6% decrease in demand
- Nurse practitioners in primary care – 105.1% increase in supply, 4.1% increase in demand
- Physician assistants in primary care – 88% increase in supply, 3.1% increase in demand

Implications/Summary

Adequacy rates provide an estimate of the degree to which workforce supply will meet demand. Rates greater than 100% indicate a surplus of workforce, while rates less than 100% imply a shortage. From Table 6, observations can be made which describe the expected status of primary care workforce in Missouri within the next 10 years.

HRSA projects that Missouri will see a surplus in two categories of care—nurse practitioners and pediatric physicians. By 2030, 2.5 nurse practitioners are projected for every 1 FTE position, resulting in a sizable surplus of providers (250% adequacy rate). As mentioned earlier, these

⁵⁸ Geriatric physician data for Missouri is not included with HRSA workforce projections.

⁵⁹ Health Resources and Services Administration. (2021). *Data downloads: Workforce projections*. Retrieved from <https://data.hrsa.gov/data/download?data=WorkforceProjections#WorkforceProjections>.

projections are based on data collected prior to the COVID-19 pandemic, which has significantly changed the landscape for nursing, including nurse practitioners. Pediatric physicians will also more than meet the demand (116% adequacy rate). Three categories of primary care are projected to have shortages by 2030: physician assistants (70% adequacy rate), general internal physicians (75%), and family physicians (87%). Primary care categories with the most improved adequacy rates between 2018 and 2030 include physician assistants (from 38% to 70% adequacy rate) and nurse practitioners (from 127% to 250%). The pediatric physician workforce will also improve 13 percentage points. Family physicians will remain static (87%) and general internal physicians will drop slightly (78% to 75%). While their shortage may appear alarming, physician assistants have only been licensed to practice in Missouri since 2009.⁶⁰

Missouri's estimated 8,310 primary care physicians in 2030 will make up about three percent of the national primary care workforce. The state's supply of family physicians and general internal physicians is expected to grow at faster rates than demand. However, state growth rates for these two areas of primary care will be less than the national growth rates (family physicians--MO 3.1% increased supply compared to U.S. six percent increase, and general internal physicians--MO 5.3% increased supply compared to U.S. 13% increase). Lower than national average growth rates in supply for Missouri will be offset somewhat by lower than national average growth rates in demand for family physicians and general internal physicians (family physicians—MO 13% increase in demand compared to U.S. 22% increase, and general internal physicians—MO 2.7% increase in demand compared to U.S. 9.6% increase).

The pediatric physician workforce supply in Missouri (8.7% increase) will grow at a rate more than four times that expected for the nation. As Missouri's population ages, demand for pediatric care will decrease in the state (-3.6%) while it grows by five percent across the nation. The net surplus of pediatric physician FTEs in Missouri may present an opportunity to incentivize students toward higher need specializations in the state.

Geriatric physicians are important to highlight, given the effects of a growing senior population on demand for health services and the workforce necessary to care for them. Geriatric physicians diagnose, treat, and prevent disability and disease in older adults. For the U.S. between 2018-2030, the supply of geriatric physicians will drop 610, while demand for services will grow 50% from 8,220 to 12,320 providers, resulting in an adequacy rate of just 62%.⁶¹

While HRSA projections do not include geriatric medicine in Missouri, the Missouri Division of Professional Registration data includes license data for physicians by specialty. Of 193 physicians with a geriatric specialty in Missouri, 152 specialize in geriatrics or geriatric medicine and 41 are geriatric psychiatrists.⁶²

⁶⁰ Missouri Revised Statutes: Title 22 334.735 (2019). Retrieved from <https://revisor.mo.gov/main/OneSection.aspx?section=334.735>.

⁶¹ Health Resources and Services Administration. (2021). *Workforce projections*. Retrieved from <https://data.hrsa.gov/topics/health-workforce/workforce-projections>.

⁶² Missouri Health Care Workforce Project database. University of Missouri Center for Health Policy.

Recent reports on Missouri's aging population, health status, rural poverty, and primary care workforce provide additional context. Census estimates predict by 2030 one in five Missourians, or 1.4 million total, will be over age 65; and the number of seniors will surpass the number of children for the first time.⁶³ Population health status influences demand for health care services, and primary care providers are key to managing chronic disease. Missouri rural residents are on average older and have a higher incidence of chronic disease than their urban counterparts. Seniors comprise 19% of the rural population compared to 15% of the urban population, and the rural poverty rate in Missouri is approximately 16% compared to the urban poverty rate of 12%.⁶⁴ The effects of aging population, declining health status, rural poverty and limited access to primary care combine for a scenario that requires heightened attention and urgency.

The supply of and demand for primary care providers varies across regions of Missouri and by rurality. General internal physicians in non-metropolitan areas are expected to decrease by 8% in supply and increase in demand by 9%, while metropolitan areas will see a 14% increase in supply and a 23% increase in demand by 2030. In the US, the gap between demand and supply is even further exacerbated for rural areas. Geriatric physician numbers are expected to drop by 200 (-37%), from 540 to 340 between 2018-2030, while demand is projected to grow from 340 to 970, an increase of 39%. This cumulative 76% change in supply and demand since 2018 results in just a 35% adequacy rate of geriatric physicians practicing in rural areas by 2030.

Health Professional Shortage Areas (HPSAs)

A Health Professional Shortage Area (HPSA) designates an area, population, or facility as having an insufficient number of primary, dental or mental health care providers. HPSAs are utilized by federal programs such as National Health Service Corps, Nurse Corps, Indian Health Service (IHS) Loan Repayment Program, and Rural Health Clinic Program, to allocate resources to designated areas of shortage.⁶⁵

Primary Care HPSAs are assigned a score between 0-25 which determines level of priority for resources.⁶⁶ (Scores are a composite of population-to-provider ratio, percent of population below 100% federal poverty level, an infant health index based on infant mortality and low birth weight rates, and travel time to nearest source of care outside HPSA area). The HPSE FTE Short Score represents how many full-time equivalent (FTE) primary care practitioners are needed to achieve a target population-to-practitioner ratio, based on the type of HPSA. Missouri currently

⁶³ Ibid 50.

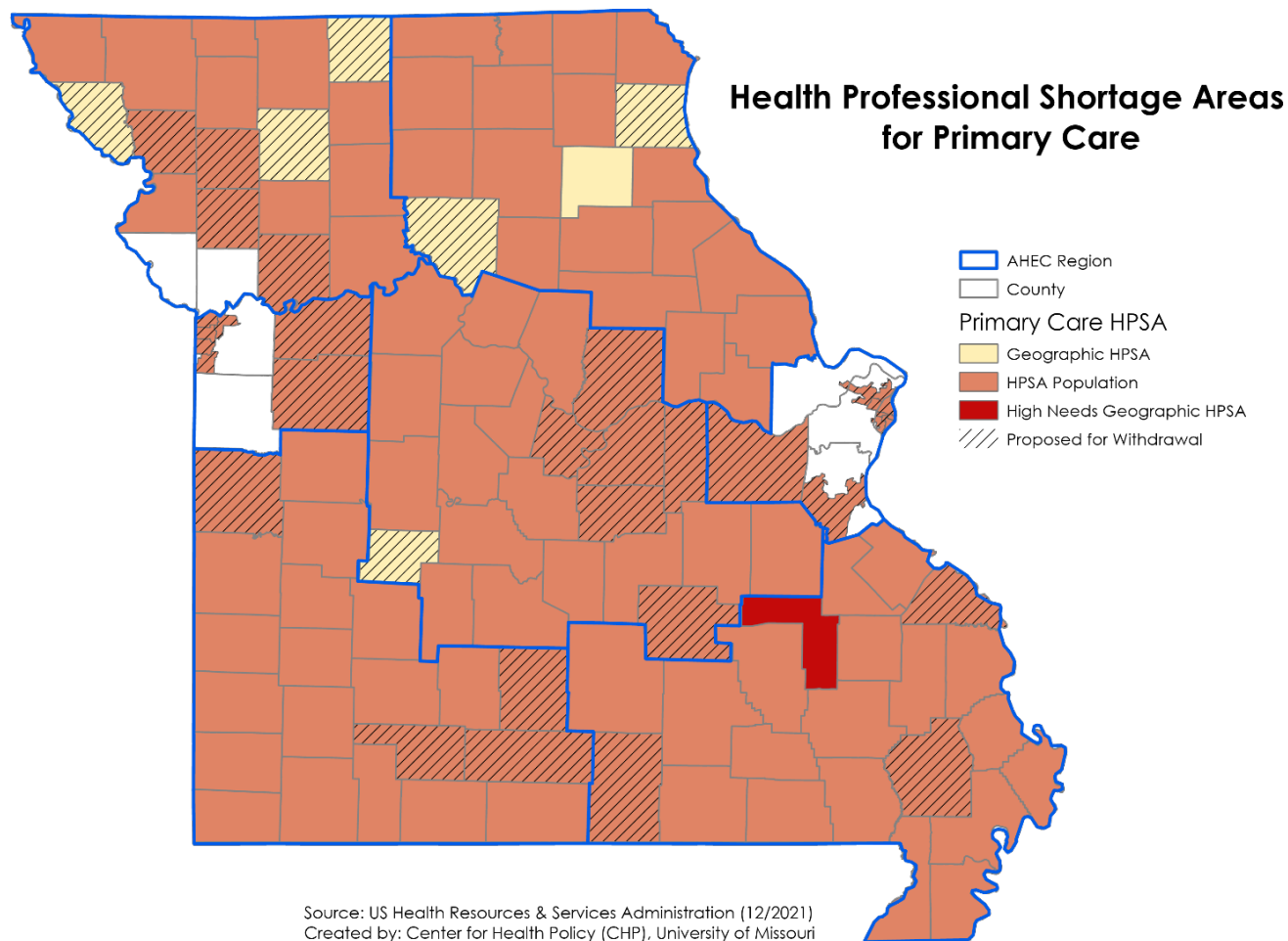
⁶⁴ Ibid 4.

⁶⁵ Health Resources and Services Administration. (2021). *What is a shortage designation?* Retrieved from <https://bhw.hrsa.gov/workforce-shortage-areas/shortage-designation>.

⁶⁶ Health Resources and Services Administration. (2021). *Scoring shortage designations*. Retrieved from <https://bhw.hrsa.gov/workforce-shortage-areas/shortage-designation/scoring>.

has 327 primary care HPSA designations displayed in the maps below;⁶⁷ and more than three-quarters are in rural areas.⁶⁸

Figure 6: Primary Care HPSA with AHEC Regions



A **geographic HPSA** represents an entire population of people from a specific geography such as a county or a state who are experiencing a shortage of health care providers. A geographic HPSA can be marked as having unusually high needs if more than 20% of the population is at or below 100% federal poverty level, more than 100 births per year per 1,000 women ages 15-44, more than 20 infant deaths per 1,000 live births, or two or more criteria are met for insufficient capacity in the designated area.

⁶⁷ Health Resources and Services Administration. (2021). HPSA Find. Retrieved from <https://data.hrsa.gov/tools/shortage-area/hpsa-find>.

⁶⁸ Office of Rural Health and Primary Care. (2021). Health in rural Missouri: Biennial report 2020-2021. Retrieved from <https://health.mo.gov/living/families/ruralhealth/pdf/biennial2020.pdf>.

The state currently has seven geographic HPSAs for primary care, including Chariton, Daviess, Hickory, Holt, Lewis, Mercer and Shelby Counties. Iron County is the only high needs geographic HPSA, and was designated in 2013. Geographic HPSA designations were updated in 2021, and all but Shelby County are proposed for withdrawal.

A population HPSA represents a specific group of people within a defined geographic area like a county or a state who are experiencing a shortage of health care providers. Specific groups may include low-income persons, migrant workers, Medicaid eligible persons, and others.

Most of the state -- including the all of rural Missouri and several regional urban centers -- is designated as a HPSA population area where residents are experiencing a shortage of primary care health services. At present, only 7 of Missouri's 115 geographies (114 counties plus the City of St. Louis) are outside a population HPSA for primary care. These non-HPSA population areas include 7 suburban counties that surround Kansas City and St. Louis.

Thirty low-income population primary care HPSAs are proposed for withdrawal, including the entirety of 26 Missouri counties, three partial county areas, and portions of the City of St. Louis.

Proposed withdrawals of geographic or low-income population primary care HPSAs would affect counties in all seven AHEC regions but would be most pronounced in the Northwest and Mid-Missouri regions, each with seven counties proposed for withdrawal.

Oral Health

Importance

Oral health is foundational to overall health and well-being. Oral health is linked to the overall health of the body, including susceptibility to oral cancer, lung disease, pregnancy and birth complications, pneumonia, stroke, heart attack and diabetes.⁶⁹ Access to quality dental education, prevention, treatment of disease, replacement and repair is crucial for all. In 2019, Missouri ranked 40th among states in dentist to population ratio (49.4 per 100,000), a slight improvement over 2018 (45.8 per 100,000), but less than half of the number one ranking (Massachusetts, 82 per 100,000). 2020 Missouri licensure statistics show significant growth across categories of dentists (12.2%), specialists (25.5%), and hygienists (77%) since 2002. However, a 2020 workforce analysis survey of dental professionals found that nearly 70% of respondents (N=357) do not practice in federally designated health shortage areas. Transition should be anticipated within the next 5 years as over 30% of respondents indicated they plan to exit dental practice in the state and over 40% do not intend to remain in their current practice in that timeframe.⁷⁰

⁶⁹ Mayo Clinic. (2021). *Oral health: A window to your overall health*. Retrieved from <https://www.mayoclinic.org/healthy-lifestyle/adult-health/in-depth/dental/art-20047475>.

⁷⁰ Dane, J. (2020). *Missouri oral health and community health: Status, challenges, and work in progress*. Retrieved from https://www.oralhealthmissouri.org/images/1010/document/dane-presentation-to-mo-coalition-6march2020_1089.pdf.

Missouri Oral Health Providers

Missouri oral health providers include dentists, dental hygienists, and dental assistants, as well as a small number of MD/DO oral surgeons (n=16). The 2021 data on these providers are from the Missouri Division of Professional Registration public release licensure data. Tables 7, 8, and 9 show the number and percent of oral health providers by rural, partially rural, and urban within each AHEC region. These data clearly indicate a shortage of dentists.

Geographic distribution of all oral health provider types is skewed toward urban areas with more severe provider shortages for all rural areas of the state. The Northeast and Southeastern AHEC Regions have the most drastic ratios of dentists to region population at 1:3,883 and 1:3,023 respectively; however, no AHEC region appears to be appropriately supplied with dentists. This not only causes issues for patient access to dental care, but also for the overburdened and possibly burned-out providers.

With over 3,500 dental hygienists and 6,000 dental assistants in Missouri's oral care workforce, the shortages of dentists may not be as severe as it seems. A single dentist working with a team of hygienists and assistants could serve more patients than a dentist alone. There are gaps in the hygienist and assistant workforces, however. In particular, the Southeastern AHEC region has a ratio of dental hygienists to population of 1 to 2,568. The dental assistant workforce is more sparse in the Northeast and Southeastern AHEC Regions with a ratios of dental assistants to population of 1 to 3,883 and 1 to 3,023 respectively. The Northeast and Southeastern AHEC Regions are the most concerning with the fewest dentists and dental assistants per population.

Table 7: Number and Percent of Rural, Partially Rural, and Urban Dentists by AHEC Region

AHEC Region	Rural # (%)	Partially Rural # (%)	Urban # (%)	Total Dentists	Total Population ⁷¹	Ratio Dentists to Population
East Central	42 (3%)	0 (0%)	1318 (97%)	1,360	2,026,525	1 to 1,490
Mid-Missouri	148 (45%)	138 (42%)	42 (13%)	328	778,698	1 to 2,374
Northeast	84 (100%)	0 (0%)	0 (0%)	84	326,208	1 to 3,883
Northwest	43 (13%)	0 (0%)	287 (87%)	330	609,093	1 to 1,846
Southeastern	119 (68%)	0 (0%)	56 (32%)	175	529,002	1 to 3,023
Southwest	89 (21%)	74 (18%)	253 (61%)	416	949,292	1 to 2,282
West Central	12 (2%)	10 (2%)	496 (96%)	518	886,092	1 to 1,711
State	537	222	2,452	3,211	6,104,910	1 to 1,902

⁷¹ American Community Survey (ACS) 1-year 2019 population estimates.

Table 8: Number and Percent of Rural, Partially Rural, and Urban Dental Hygienists by AHEC Region

AHEC Region	Rural # (%)	Partially Rural # (%)	Urban # (%)	Total Dental Hygienists	Total Population ⁷²	Ratio Dental Hygienists to Population
East Central	73 (6%)	0 (0%)	1229 (94%)	1,302	2,026,525	1 to 1,556
Mid-Missouri	211 (56%)	131 (35%)	33 (9%)	375	778,698	1 to 2,077
Northeast	164 (100%)	0 (0%)	0 (0%)	164	326,208	1 to 1,989
Northwest	73 (17%)	0 (0%)	348 (83%)	421	609,093	1 to 1,447
Southeastern	165 (80%)	0 (0%)	41 (20%)	206	529,002	1 to 2,568
Southwest	187 (28%)	160 (24%)	333 (49%)	680	949,292	1 to 1,396
West Central	20 (4%)	20 (4%)	440 (92%)	480	886,092	1 to 1,846
State	893	311	2,424	3,628	6,104,910	1 to 1,683

Table 9: Number and Percent of Rural, Partially Rural, and Urban Dental Assistants by AHEC Region

AHEC Region	Rural # (%)	Partially Rural # (%)	Urban # (%)	Total Dental Assistants	Total Population ⁷³	Ratio Dental Assistants to Population
East Central	145 (11%)	0 (0%)	1,175 (89%)	1,320	2,026,525	1 to 1,535
Mid-Missouri	597 (55%)	294 (27%)	193 (18%)	1,084	778,698	1 to 718
Northeast	333 (100%)	0 (0%)	0 (0%)	333	326,208	1 to 980
Northwest	113 (19%)	0 (0%)	467 (81%)	580	609,093	1 to 1,050
Southeastern	325 (84%)	0 (0%)	63 (16%)	388	529,002	1 to 1,363
Southwest	652 (34%)	173 (9%)	1,080 (57%)	1,905	949,292	1 to 498
West Central	33 (5%)	40 (7%)	534 (88%)	607	886,092	1 to 1,459
State	2,198	507	3,512	6,217	6,104,910	1 to 981

⁷² Ibid 71.

⁷³ Ibid 71.

HRSA Oral Health Workforce Projections

Definitions

HRSA defines the oral health workforce as dentists and dental hygienists. Dentistry specializations include general dentists, pediatric dentists, endodontists, orthodontists, periodontists, and oral surgeons.⁷⁴

HRSA projections are based on modeling of workforce supply and demand for each health profession category. While projections can be useful tools for planning, it's important to remember that these are estimates based on data from 2017, well before the COVID-19 pandemic and its implications for the health care workforce supply as well as health care demand.

Supply modeling includes estimating number and characteristics of current supply, number and characteristics of entrants, workforce attrition (mortality, retirement, or career change), and workforce participation behaviors including work hour patterns and state-level migration. Demand modeling includes estimating demand for services with methods specific to each discipline. For example, oral health demand is modeled from population characteristics and annual visits to oral health providers, and translation of national provider-to-visit ratios.⁷⁵

Supply and Demand

This section highlights U.S. supply and demand estimates for oral health workforce from 2017-2030. The most recent Missouri estimates are based on data for 2012-2025, so state and national estimates are not directly comparable.⁷⁶ Tables 10 and 11 below highlight changes in supply and demand across oral health care workforce categories in the United States and in Missouri, followed by a discussion of adequacy rates for categories where Missouri's supply is expected to be lower, or demand higher, than national estimates.

⁷⁴ Health Resources and Services Administration. (2021). Technical documentation for health resources and services administration's health workforce simulation model. Retrieved from <https://bhw.hrsa.gov/data-research/projecting-health-workforce-supply-demand/oral-health>.

⁷⁵ Health Resources and Services Administration. (2021). *Oral Health Workforce Projections*. Retrieved from https://bhw.hrsa.gov/sites/default/files/bureau-health-workforce/data-research/technical-documentation-health-workforce-simulation-model_092921.pdf.

⁷⁶ U.S. Department of Health and Human Services, Health Resources and Services Administration, National Center for Health Workforce Analysis. (2015). *National and State-Level Projections of Dentists and Dental Hygienists in the U.S., 2012-2025*. Retrieved from <https://bhw.hrsa.gov/sites/default/files/bureau-health-workforce/data-research/national-state-level-projections-dentists.pdf>.

Table 10: U.S. Oral Health Workforce Supply and Demand

Oral Health Category	2017 supply (#)	2017 demand (#)	2017 adequacy rate (%)	2030 supply (% change)	2030 demand (% change)	2030 adequacy rate (%)
General	151,170	151,170	100%	160,680 (6%)	165,490 (10%)	97%
Pediatric	7,320	7,320	100%	10,970 (50%)	7,470 (2%)	147%
Endodontist	5,390	5,390	100%	6,300 (17%)	5,750 (7%)	110%
Oral surgeons	7,070	7,070	100%	7,960 (13%)	7,590 (7%)	105%
Orthodontists	9,990	9,990	100%	11,610 (16%)	9,890 (-1%)	117%
Periodontists	5,480	5,480	100%	5,490 (0%)	6,080 (11%)	90%
Other dentists	4,090	4,090	100%	4,920 (20%)	4,580 (12%)	107%
Total dentists	190,510	190,510	100%	207,930 (9%)	206,850 (9%)	101%
Dental hygienists	147,470	147,470	100%	176,660 (20%)	157,240 (7%)	112%

Note: HRSA projections for U.S. oral health workforce report equal numbers for base year supply and demand

Table 11: Missouri Oral Health Workforce Supply and Demand

Oral Health Category	2012 supply (#)	2012 demand (#)	2012 adequacy rate (%)	2025 supply (% change)	2025 demand (% change)	2025 adequacy rate (%)
Dentists	2,826	3,107	91%	2,657 (-6%)	2,802 (-10%)	95%
Dental hygienists	2,932	2,932	100%	3,072 (5%)	2,914 (-1%)	105%

United States

In 2017, the United States had 190,510 full-time dentists across all specializations, and an estimated 147,470 full-time dental hygienists.

By 2030, the dentist workforce supply is projected to increase by 9% overall to 207,930 total dentists, including growth in the following specializations:

- Pediatric dentists -- 50% increase
- Endodontists -- 17% increase
- Orthodontists -- 16% increase
- Oral surgeons -- 13% increase

On the demand side, 2030 projections include an overall 9% increase in demand for full-time dentists (to overall 206,850), most notably for:

- Periodontists -- 11% increase
- General dentists -- 9% increase
- Oral surgeons -- 7% increase
- Endodontists -- 7% increase
- Pediatric dentists -- 2% increase
- Orthodontists -- slight decrease

By 2030, dental hygienist supply is expected to grow by 20% to 176,660, offset by a 7% increase in demand for full-time dental hygienists at 157,240.

Altogether, changes in oral health workforce will result in a 101% adequacy rate for dentists and a 112% adequacy rate for dental hygienists. A national surplus of oral health providers in the United States suggests professionals may be seeking out new regions of the country to practice.

Missouri

In Missouri, the number of full-time equivalent dentists was approximately 2,826 in 2012. Dental Health Care Professional Shortage Areas (DHPSA) captured a shortage of 281 dentists, which when combined with supply result in total demand for services at 3,107 dentists.

By 2025, HRSA projects the supply of Missouri dentists to drop 6% from 2,826 to 2,657, while the demand for oral care is projected to decline from 3,107 to 2,802 dentists. The adequacy rate for dentists in Missouri is expected to increase from 91% to 95% between 2012 and 2025.

However, considering supply, demand, and DHPSA estimate shortages together, the state will have 426 fewer dentists than the optimal number within the next four years.

When matched against projections for all the United States, Missouri estimates indicate widening differences in supply and demand. Oral health workforce supply will decrease by 6% in Missouri and by 7% across all Midwest region states, while US supply will grow by 6%. Demand in Missouri will decrease at a faster rate than supply (-10%), declining six percentage points more than the Midwest (-4%). Conversely, demand nationally will increase 7%.

Turning to dental hygienists in Missouri, 2012 demand and supply both registered at 2,932 care providers. By 2025, supply is expected to grow by almost 5% to 3,072 hygienists, more than fulfilling the state demand for 2,914 full-time equivalent workers in this category. This surplus of 158 dental hygienists yields an adequacy rate of 105%.

Summary/Implications

Many of the adverse effects of oral health workforce shortage are borne by Missouri rural residents. Compared to urban areas, rural counties have lower oral hygiene and higher need for urgent dental care in children. Thirty-six rural Missouri counties lack fluoridated water systems, which lower the incidence of cavities in children. Eleven rural counties are without a licensed dentist.⁷⁷

The Missouri Oral Health Plan 2020-2025 prioritizes support for the development of the state's oral health workforce.⁷⁸ Potential strategies include incentive programs for work in rural and underserved areas, recruitment and retention support, partnership with MAHEC on pipeline programs for underrepresented students to pursue careers, expanding access to care through teledentistry, broader deployment of existing oral health professionals to the full extent of their training, and assessment of oral health workforce involving an integrated statewide database.

The Oral Health 'Burden' Report also calls for "improvements to the distribution and availability of oral health professionals, especially those that serve low-income individuals...in order to decrease tooth loss in adults and reduce the use of hospitals for non-traumatic dental complaints."⁷⁹

While the adequacy rate for dentists in Missouri is expected to improve slightly from 91% to 97% by 2025, the decrease in FTE dentist supply will fall short of matching increases in demand. This shortage of dentists can be expected to exacerbate access problems for underserved populations due to limited oral health literacy, inability to pay, and/or lack of proximity to providers.

Dental hygienists are one bright spot where an excess supply is estimated. The increase in supply of hygienists in Missouri is expected to produce a surplus of 158 FTEs by 2025.

One issue to watch is the evolving and expanding role of dental hygienists in oral health delivery, as a possible offset to the shortage of dentists. Policies that extend the scope of practice or range of care dental hygienists can provide are being explored. Some states are in the early stages of providing additional training for advanced dental hygienists that would expand their roles to the maximum allowable under state laws.

⁷⁷ Missouri Department of Health and Senior Services. (2020). *Oral Health in Missouri – 2020*. Retrieved from <https://health.mo.gov/living/families/oralhealth/pdf/oral-health-burden-report.pdf>

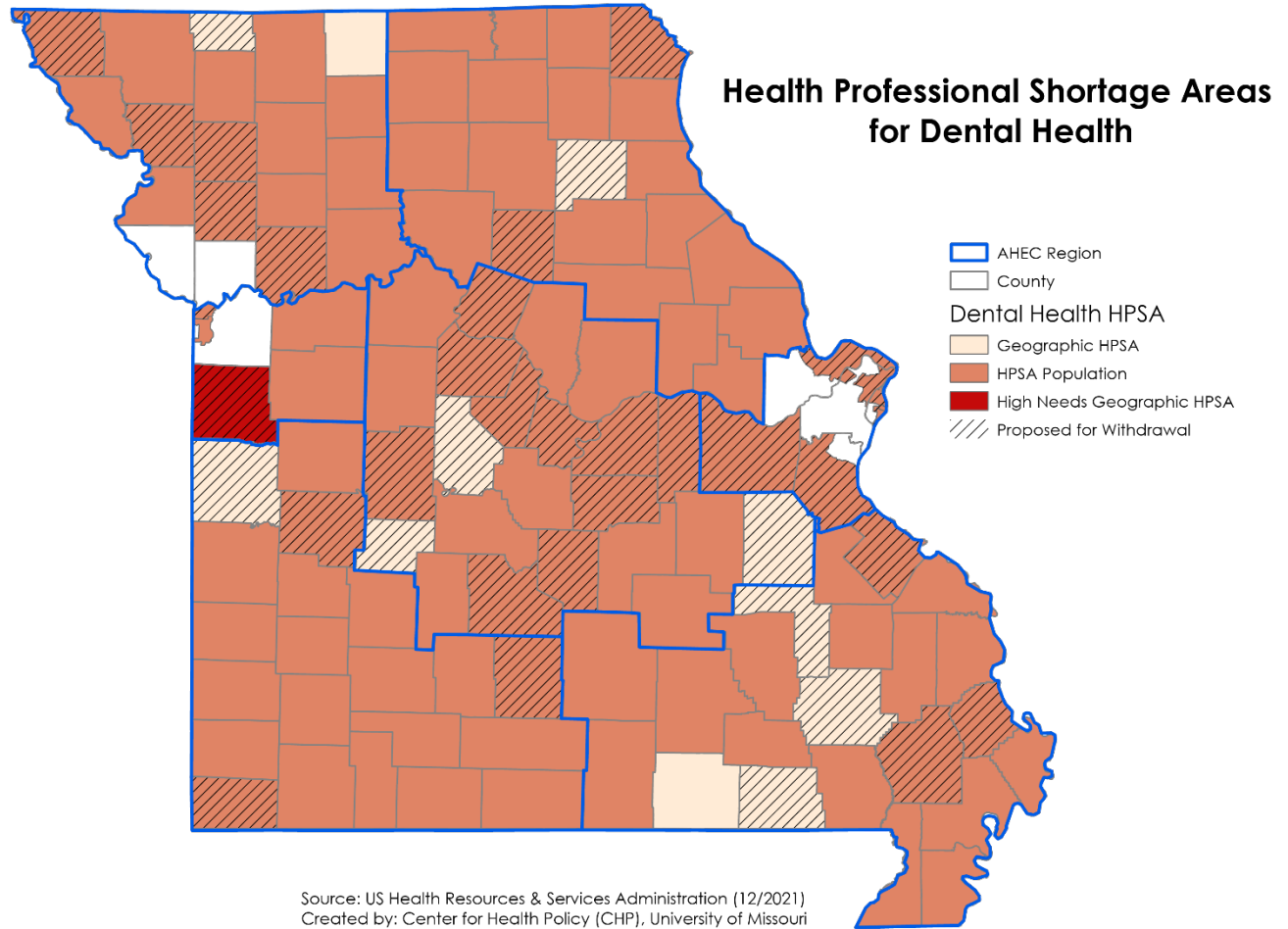
⁷⁸ Missouri Department of Health and Senior Services. (2020). *Missouri Oral Health Plan 2020-2025*. Retrieved from <https://health.mo.gov/living/families/oralhealth/pdf/oral-health-plan-2020-2025.pdf>

⁷⁹ Ibid 77.

Health Professional Shortage Areas (HPSAs)

Missouri has 317 dental health HPSAs (79 of 95 Oral Health geographic and population based HPSAs are in rural areas of Missouri).⁸⁰

Figure 7. Health Professional Shortage Areas for Dental Health



Missouri has ten **geographic HPSAs for oral health**, including Bates, Hickory, Mercer, Morgan, Oregon, Ripley, Shelby, Wayne, and Worth Counties, and the two-county region of Washington and Iron. All but two geographic HPSAs, Mercer and Oregon, are proposed for withdrawal. Mercer County was designated as a geographic HPSA in 1985 (HPSA FTE Short 0.72)⁸¹. Oregon County was identified as a geographic HPSA in 2012 (HPSA FTE Short 0.95)⁶⁴. In 2017, Cass County, Missouri was designated as a High Needs Geographic HPSA (HPSA FTE Short 1.89)⁶⁴ but is proposed for withdrawal.

⁸⁰ Office of Rural Health and Primary Care. (2021). *Health in rural Missouri: Biennial report 2020-2021*. Retrieved from <https://health.mo.gov/living/families/ruralhealth/pdf/biennial2020.pdf>

⁸¹ The HPSE FTE Short Score equals the number of full-time equivalent (FTE) practitioners it would take to attain the target ratio of population-to-practitioner for that type of HPSA.

Nearly every county in Missouri is designated as a **low-income population HPSAs for oral health**. The exceptions are all of Platte and Clay Counties and portions of Jackson County in the Kansas City metropolitan area; portions of St. Louis City and Jefferson, St. Louis and St. Charles Counties in the St. Louis metropolitan area; and the eleven counties that are designated as geographic HPSAs.

Twenty-seven low-income population HPSAs are proposed for withdrawal, including 24 full counties and five partial county areas. Some HPSAs proposed for withdrawal are comprised of two or more counties.

HPSA withdrawals would affect counties in all seven AHEC regions but would be most apparent in the Mid-Missouri region with thirteen counties proposed to change HPSA status.

Mental and Behavioral Health

Importance

Mental and behavioral health care helps people identify how behaviors influence physical and mental health, and how to adopt positive behaviors to replace unhealthy ones. Mental illness and substance use disorders are key factors in disability, mortality, and health care costs. The prevalence of opioid addiction and related deaths is a crisis that continues. Mental and behavioral health professionals bring a holistic approach to wellness, helping patients manage mental and behavioral issues that allow them to lead happier, healthier, and more productive lives.⁸²

Missouri Mental and Behavioral Health Workforce

This section includes a summary of counts of Missouri Mental and Behavioral Health providers for 2021 provided by the Missouri Division of Professional Registration. Mental health providers include counselors, psychologists, social workers, marriage and family therapists, behavior analysts and assistant behavior analysts by AHEC Region. Table 12 is a summary of the 2021 data and shows the ratio of mental health providers to AHEC region population. Population data was retrieved from the 2019 ACS. As is typical for other professions within the Missouri health care workforce, mental health providers tend to practice in urban over rural areas, but shortages exist across the state. The ratio of providers to AHEC region population are concerning due to increased access to insurance coverage due to Medicaid expansion and ACA, as well as the increased need for mental health services due to trauma and PTSD from pandemic-related issues.⁸³

⁸² Medline Plus. (2015). *Mental Health*. Retrieved from <https://medlineplus.gov/mentalhealth.html>.

⁸³ Grimm, Christi A. "Hospitals Reported That the COVID-19 Pandemic Has Significantly Strained Health Care Delivery." (2021). Retrieved from <https://oig.hhs.gov/oei/reports/OEI-09-21-00140.pdf>.

Table 12: Number of Rural, Partially Rural, and Urban Missouri Mental and Behavioral Health Providers by AHEC Region

AHEC Region	Rural # (%)	Partially Rural # (%)	Urban # (%)	Total Providers	Total Population ⁸⁴	Ratio Providers to Population
East Central	149 (2%)	0 (0%)	6,380 (98%)	6,529	2,026,525	1 to 310
Mid-Missouri	579 (36%)	855 (53%)	171 (11%)	1,605	778,698	1 to 485
Northeast	314 (100%)	0 (0%)	0 (0%)	314	326,208	1 to 1038
Northwest	157 (14%)	0 (0%)	958 (86%)	1,115	609,093	1 to 546
Southeastern	589 (75%)	0 (0%)	193 (25%)	782	529,002	1 to 676
Southwest	408 (23%)	289 (16%)	1,086 (61%)	1,783	949,292	1 to 532
West Central	87 (4%)	40 (2%)	1,921 (94%)	2,048	886,092	1 to 432
State	2,283	1,184	10,709	14,176	6,104,910	1 to 431

HRSA Mental and Behavioral Health Workforce Projections

Definitions

HRSA defines mental and behavioral health workforce as adult psychiatrists, child and adolescent psychiatrists, psychiatric nurse practitioners, psychiatric physician assistants, psychologists, social workers, marriage and family therapists, addiction counselors, mental health counselors and school counselors.

HRSA projections are based on modeling of workforce supply and demand for each health profession category. While projections can be useful tools for planning, it's important to remember that these are estimates based on data from 2016 and 2017, well before the COVID-19 pandemic and its implications for the health care workforce supply as well as health care demand.

Supply modeling includes estimating number and characteristics of current supply, number and characteristics of entrants, workforce attrition (mortality, retirement, or career change), and workforce participation behaviors including work hour patterns and state-level migration. Demand modeling includes estimating demand for services with methods specific to each discipline.⁸⁵

⁸⁴ American Community Survey (ACS) 1-year 2019 population estimates.

⁸⁵ Health Resources and Services Administration. (2021). *Technical documentation for health resources and services administration's health workforce simulation model*. Retrieved from

Supply and Demand

This section highlights U.S. supply and demand estimates for the mental and behavioral health workforce from 2017-2030. Missouri estimates are for 2016-2030, so comparisons between state and national estimates are not exact.⁸⁶ Table 13 summarizes shifts in supply and demand across mental and behavioral health workforce occupations in the United States and in Missouri. This is followed by commentary on adequacy rates, focusing on discrepancies between Missouri and U.S. supply and demand.

HRSA projections for mental and behavioral health care are calculated differently than for primary care and oral health. Mental and behavioral health care estimate tables provide two different scenarios for forecasting supply and demand: 1) equilibrium, and 2) unmet needs. Equilibrium estimates are smaller more conservative figures (and are included in Table 13 and in this gap analysis), while unmet needs estimates are higher figures.

Table 13: U.S. and Missouri Mental and Behavioral Health Workforce Supply and Demand

Mental and Behavioral Health Category	MO US	2016/17 supply (#) ^{87, 88}	2016/17 demand (#) ^{69, 70}	2016/17 adequacy rate (%) ^{69, 70}	2030 supply (% change) ^{69, 70}	2030 demand (% change) ^{69, 70}	2030 adequacy rate (%) ^{69, 70}
Adult psychiatrists	MO	630	870	72%	430 (-32%)	860 (-1%)	50%
	US	33,650	38,410	88%	27,020 (-20%)	39,550 (3%)	68%
Child and adolescent psychiatrists	MO	100	150	67%	140 (40%)	140 (-7%)	100%
	US	8,090	9,240	88%	9,830 (22%)	9,190 (-1%)	107%
Psychiatric nurse practitioners	MO	260	220	118%	370 (42%)	250 (14%)	148%
	US	10,450	10,450	100%	16,900 (62%)	12,050 (15%)	140%
Psychiatric physician assistants	MO	20	30	67%	50 (150%)	30 (0%)	167%
	US	1,550	1,550	100%	2,890 (87%)	1,670 (8%)	173%
Psychologists	MO	1,520	1,850	82%	2,030 (34%)	1,870 (1%)	109%
	US	91,440	91,440	100%	103,440 (13%)	95,600 (5%)	108%
Social workers	MO	3,890	4,640	84%	7,750 (99%)	5,060 (9%)	153%
	US	239,410	239,410	100%	513,370 (114%)	268,750 (12%)	191%

https://bhw.hrsa.gov/sites/default/files/bureau-health-workforce/data-research/technical-documentation-health-workforce-simulation-model_092921.pdf

⁸⁶ Health Resources and Services Administration. (2021). *Behavioral Health Workforce Projections*. Retrieved from <https://bhw.hrsa.gov/data-research/projecting-health-workforce-supply-demand/behavioral-health>, and Health Resources and Services Administration. (2021). *State-Level Projections of Supply and Demand for Behavioral Health Occupations: 2016-2030*. Retrieved from <https://bhw.hrsa.gov/sites/default/files/bureau-health-workforce/data-research/state-level-estimates-report-2018.pdf>

⁸⁷ U.S. supply and demand estimates are for 2017-2030; Missouri supply and demand estimates are for 2016-2030.

⁸⁸ HRSA projections include estimates for supply and demand based on two different scenarios: 1) equilibrium, and 2) unmet needs. Status quo extrapolates current levels of care to future populations. The unmet needs scenario assumes a health care system that continues trending toward improved access and comprehensiveness of care. Table 13 uses equilibrium estimates for supply and demand (a more conservative estimate).

Mental and Behavioral Health Category	MO US	2016/17 supply (#) ^{87, 88}	2016/17 demand (#) ^{69, 70}	2016/17 adequacy rate (%) ^{69, 70}	2030 supply (% change) ^{69, 70}	2030 demand (% change) ^{69, 70}	2030 adequacy rate (%) ^{69, 70}
Marriage and family therapists	MO	880	1,060	83%	1,040 (18%)	1,160 (9%)	90%
	US	53,080	53,080	100%	72,650 (37%)	57,970 (9%)	125%
Addiction counselors	MO	1,750	1,870	94%	1,340 (-23%)	2,200 (17%)	61%
	US	91,340	91,340	100%	93,880 (3%)	105,410 (15%)	89%
Mental health counselors	MO	2,860	2,930	98%	2,600 (-9%)	3,330 (14%)	78%
	US	140,760	140,760	100%	164,320 (17%)	158,850 (13%)	103%
School counselors	MO	2,720	2,050	133%	4,610 (70%)	2,010 (-2%)	229%
	US	116,080	116,080	100%	218,130 (88%)	119,140 (3%)	183%
Total	MO	14,630	15,670	93%	20,360 (39%)	16,910 (8%)	120%
	US	785,850	791,760	99%	1,222,430 (55%)	868,180 (10%)	141%

United States

In 2017, the mental and behavioral health workforce supply in the United States included an estimated 785,850 care providers. The distribution of providers across categories included:

- 33,650 adult psychiatrists
- 8,090 child and adolescent psychiatrists
- 10,450 psychiatric nurse practitioners
- 1,550 psychiatric physician assistants
- 91,440 psychologists
- 239,410 social workers
- 53,080 marriage and family therapists
- 91,340 addiction counselors
- 140,760 mental health counselors
- 116,080 school counselors

By 2030, expected increases in the supply of mental and behavioral health workers include:

- 20% decrease to 27,020 adult psychiatrists
- 22% increase to 9,830 child & adolescent psychiatrists
- 62% increase to 16,900 psychiatric nurse practitioners
- 86% increase to 2,890 psychiatric physician assistants
- 13% increase to 103,440 psychologists
- 114% increase to 513,370 social workers
- 37% increase to 72,650 marriage & family therapists
- 3% increase to 93,880 addiction counselors
- 17% increase to 164,320 mental health counselors
- 88% increase to 218,130 school counselors

Projected changes include substantial growth in social workers, school counselors, and physician assistants. Conversely, the decrease in adult psychiatrists presents a significant decrease in care and coverage that may have adverse effects on regions throughout the country, particularly related to prescriptions for mental and behavioral health conditions.

Demand for mental and behavioral health care providers by 2030 includes the following projections:

- 3% increase to 39,550 for adult psychiatrists
- 1% decrease to 9,190 for child & adolescent psychiatrists
- 15% increase to 12,050 for psychiatric nurse practitioners
- 8% increase to 1,670 for psychiatric physician assistants
- 5% increase to 95,600 for psychologists
- 12% increase to 268,750 for social workers
- 9% increase to 57,970 for marriage & family therapists
- 15% increase to 105,410 for addiction counselors
- 13% increase to 158,850 for mental health counselors
- 3% increase to 119,140 for school counselors

Estimated supply-to-demand comparisons for the United States indicate a coming surplus of mental and behavioral health workers in most categories of care by 2030. Surpluses are estimated to be most pronounced among specializations with adequacy rates well above 100%: social workers (191% adequacy rate), school counselors (183%), psychiatric physicians assistants (173%), psychiatric nurse practitioners (140%), and marriage and family therapists (125%). Adult psychiatrists (68% adequacy rate) and addiction counselors (89%) are categories where shortages in the nation's workforce are expected.

Missouri

In 2016, the mental and behavioral health workforce supply in Missouri included an estimated 14,630 care providers, or roughly 1.9% of the national workforce. The distribution of providers across categories included:

- 630 adult psychiatrists
- 100 child and adolescent psychiatrists
- 260 psychiatric nurse practitioners
- 20 psychiatric physician assistants
- 1,520 psychologists
- 3,890 social workers
- 880 marriage and family therapists
- 1,750 addiction counselors
- 2,860 mental health counselors
- 2,720 school counselors

By 2030, Missouri's mental and behavioral health workforce will grow to approximately 20,360 total providers, an increase of 39% over 2016. Expected changes in supply and demand by provider category include:

- Adult psychiatrists – 31.7% decrease in supply, 1% decrease in demand
- Child and adolescent psychiatrists – 40% increase in supply, 7% decrease in demand
- Psychiatric nurse practitioners – 42.3% increase in supply, 13.6% increase in demand
- Psychiatric physician assistants – 150% increase in supply, no change in demand
- Clinical, counseling and school psychologists – 33.6% increase in supply, 1% increase in demand
- Social workers – 99.2% increase in supply, 9.1% increase in demand
- Marriage & family therapists – 18.2% increase in supply, 9.4% increase in demand
- Addiction counselors – 23% decrease in supply, 17% increase in demand
- Mental health counselors – 9.1% decrease in supply, 13.7% increase in demand
- School counselors – 69.5% increase in supply, 2% decrease in demand

As with U.S. projections, sharp increases are anticipated for several categories of mental and behavioral health workforce supply. Topping the list are psychiatric physician assistants with a 150% increase in supply and no change in demand, resulting in a 167% adequacy rate by 2030. (Psychiatric physician assistants make up the smallest proportion of all mental and behavioral health categories).

Supply decreases are expected in three important fields in Missouri, including adult psychiatrists, addiction counselors and mental health counselors. If supply decreases for these three fields follow HRSA's projections, Missouri would face alarming shortages, with adequacy rates anticipated to be just 50% for adult psychiatrists, 61% for addiction counselors and 78% for mental health counselors by 2030. Some of the demand for services may be filled through telehealth, but providers would still need to be licensed in Missouri.

Summary/Implications

Table 13 provides numerous insights into how Missouri's mental and behavioral health workforce is projected to change by 2030. Highlights include expected surpluses, shortages and adequacy rates across mental and behavioral health categories. Comparing Missouri to U.S. adequacy rates also provides a glimpse of how supply and demand will likely change over the next decade.

Overall, the estimated supply of mental and behavioral workforce will more than meet the state's demand for providers by 2030 (120% adequacy rate). However, a dichotomy is expected across various categories of care. Six mental and behavioral health categories expect a surplus (adequacy rates ranging from 100% to 229%), while four categories may face a shortage (adequacy rates between 50% to 90%). Despite a slight drop in expected demand for school counselors in Missouri (-2%), this category may grow by 70% (nearly 2,000 new workers), resulting in the highest adequacy rate of any category (229%).

Missouri has a small number of psychiatric physician assistants and psychiatric nurse practitioners, yet both groups are trending toward a strong surplus by 2030 (167% and 148% adequacy rates, respectively). Psychiatric physician assistants are projected to add 30 new professionals, bringing the total number in the state to 50 (an adequacy rate jump from 67% to 167%). Social workers are also expected to add an almost unprecedented 7,750 workers (99% increase). Combined with a 9% increase in demand, this results in a social worker adequacy rate of 153%. Psychologists (109% adequacy rate) and child and adolescent psychiatrists (107% adequacy rate) round out the other categories expecting a surplus.

In terms of workforce shortage, adult psychiatrists are projected to have the lowest adequacy rate (50%) among mental and behavioral health categories by 2030, a 32-percentage point loss since 2016. This is particularly alarming for those requiring prescriptions to manage their mental and behavioral health conditions. Likewise, addiction counselors are expected to shrink 23 percentage points to 1,340 total professionals across the state, lowering the 2016 adequacy rate of 94% to 61% in 2030, at a time when increased substance use disorder treatment is needed in Missouri and across the country.^{89, 90, 91} While Missouri's demand for mental health counselors shows a projected 14% increase in the next 10 years, the estimated number of licensed counselors will drop 9%, for a 78% adequacy rate that is 20 percentage points lower than 2016. The number of practicing marriage and family therapists is estimated to grow by 18%, narrowing the gap on adequate statewide workforce demand with an improved 90% adequacy rate.

Comparing Missouri to U.S. adequacy rates for 2016/2017, the state had better than national rates in only two of the ten mental and behavioral health care categories (school counselors and psychiatric nurse practitioners). By 2030, Missouri is expected to surpass the national adequacy rate for psychologists at 109%, an improvement of 27 percentage points over the 2016 adequacy rate. While 2030 Missouri adequacy rates were still lower than the U.S. in seven categories, five of these categories involve workforce surpluses.

In summary, sizable growth is forecast in several areas of mental and behavioral health care supply, including some categories of care where large surpluses will or already exist. The greatest mental and behavioral health workforce supply growth will be among psychiatric physician assistants (150%), social workers (99.2%), and school counselors (69.5%). Over the same period, Missouri is projected to lose providers in several areas of care that have growing demand and are critical to the health and well-being of the state's population. Missouri's workforce will face a shortage of 1,400 mental health counselors and 1,300 addiction counselors, and nearly 500 psychiatrists. Results of this gap analysis suggest Missouri's health care system,

⁸⁹ Khatri, U. G., Perrone, J. (2020). *Opioid Use Disorder and COVID-19: Crashing of the Crises*. Journal of addiction medicine, 14(4), e6–e7. Retrieved from <https://doi.org/10.1097/ADM.0000000000000684>

⁹⁰ Knopf, A. (2020) *CCAPP: Number of deaths from untreated addiction may rival those from COVID-19*. Alcoholism & Drug Abuse Weekly, 32: 1-5. Retrieved from <https://doi.org/10.1002/adaw.32729>

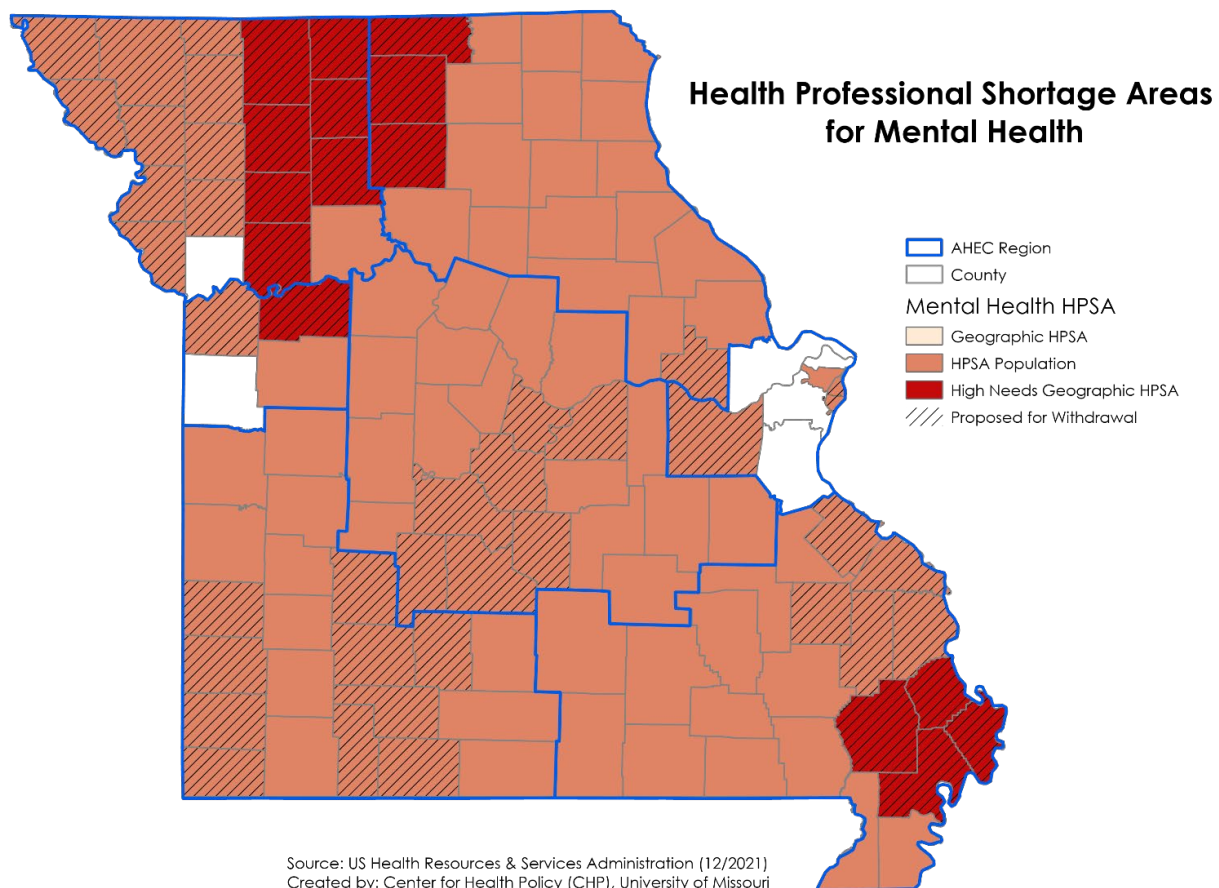
⁹¹ Lewis, L., Carpenter, C. R., Schwarz, E. S., Jotte, R. S., Waller, C., Winograd, R., Williams, R., Stenger, S., Rehder, H., Governick, S., Giuffra, L. (2017). *The Opioid Crisis in Missouri: A Call to Action for Physicians, Legislators, and Society*. Missouri Medicine, 114(6), 440–446.

professional training and pipeline programs identify strategies to incentivize students, attract out-of-state providers to relocate, and retain high-quality professionals to fill anticipated holes in coverage by 2030. Telehealth is one potential option to increase access for many mental and behavioral health care services. See more information on broadband access in Missouri in the Health Care Infrastructure section.

Health Professional Shortage Areas (HPSAs):

Nearly all of Missouri is covered by a mental health HPSA. These include three **high needs geographic HPSAs** covering all of 15 counties, and 20 **low-income population HPSAs** covering all of 96 counties as well as portions of St. Louis County. Nineteen of 23 Mental Health geographic and population based HPSAs are either partially or entirely in rural areas of Missouri.⁹²The only portions of Missouri that are not covered by a mental health HPSA are Cass and Clay Counties in the Kansas City metropolitan area, and Jefferson and St. Charles Counties and portions of St. Louis County in the St. Louis metropolitan area.

Figure 8. Health Professional Shortage Areas for Mental Health



⁹² Office of Rural Health and Primary Care. (2021). *Health in rural Missouri: Biennial report 2020-2021*. Retrieved from <https://health.mo.gov/living/families/ruralhealth/pdf/biennial2020.pdf>

All three high needs geographic HPSAs and ten low-population HPSAs are proposed for withdrawal, displayed in Figure 8 above as clusters of counties within the Northeast, Mid-Missouri, Southeastern, and Southwest AHEC regions. After withdrawals, mental health shortage areas would remain throughout most of the Northeast and Southeastern AHEC regions, as well as pockets of counties in the Mid-Missouri region's eastern and western counties, and in ribbons of counties in Southwest Missouri. HPSA withdrawals would affect all seven AHEC regions, most notably the Northwest region where 17 of 19 counties would change HPSA status.

Other Providers of Interest in Missouri

The tables in this section include 2021 data provided by the Missouri Division of Professional Registration. Tables 17, 18, 19, and 20 below show the same skewed distribution of providers in urban areas as well as statewide shortages. Provider shortages for pharmacists, pharmacy technicians, physical therapists, and physical therapy assistants are concerning for Missouri due to its aging population and the increased need for these services that will create. As seen on Table 1 (page 7), the population aged 65 and older in Missouri has grown steadily for the last decade to over 1,000,000 people in the age group. Figure 2 on page 10 shows that the Southwest and Southeastern AHEC regions have the highest percentage of population aged 65 and older.

Missouri's Nursing Workforce

The Missouri State Board of Nursing offers two license types: Licensed Practical Nurse (LPN) and Registered Nurse (RN). RNs who complete additional education and training to obtain national certification and recognition from the Missouri State Board of Nursing may practice as Advanced Practice Registered Nurses (APRNs) in Missouri.

Tables 14, 15 and 16 present 2021 nurse counts from Missouri Division of Professional Registration licensure data. These data demonstrate skewed geographic distribution of the APRN, RN, and LPN workforce toward urban areas when compared to rural.

The distribution of APRNs and RNs follows the pattern of other providers in that urban areas have a higher concentration of nurses than rural areas. While the ratio of APRNs-to-population indicate shortages of these providers, it is important to note the trends for RNs. The ratios of RNs-to-population in urban areas appears to be sufficient for the population but in rural areas is inadequate for the population. This indicates a geographic provider maldistribution between rural and urban areas. Rather than too few graduates, Missouri has enough nurses but they are not equitably dispersed throughout the state.

Table 14: Number and Percent of Rural, Partially Rural, and Urban Advanced Practice Registered Nurses (APRNs) by AHEC Region

AHEC Region	Rural # (%)	Partially Rural # (%)	Urban # (%)	Total APRN	Total Population ⁹³	Ratio APRN to Population
East Central	107 (3%)	0 (0%)	3,631 (97%)	3,738	2,026,525	1 to 542
Mid-Missouri	326 (37%)	422 (48%)	124 (14%)	872	778,698	1 to 893
Northeast	209 (100%)	0 (0%)	0 (0%)	209	326,208	1 to 1,561
Northwest	100 (17%)	0 (0%)	501 (83%)	601	609,093	1 to 1,013
Southeastern	452 (62%)	0 (0%)	275 (38%)	727	529,002	1 to 728
Southwest	281 (23%)	253 (21%)	681 (56%)	1,215	949,292	1 to 781
West Central	31 (2%)	22 (1%)	1,669 (97%)	1,722	886,092	1 to 515
State	1,506	697	6,881	9,084	6,104,910	1 to 672

Table 15: Number and Percent of Rural, Partially Rural, and Urban Registered Nurses (RNs) by AHEC Region

AHEC Region	Rural # (%)	Partially Rural # (%)	Urban # (%)	Total RN	Total Population ⁹⁴	Ratio RN to Population
East Central	843 (3%)	0 (0%)	29,044 (97%)	29,887	2,026,525	1 to 68
Mid-Missouri	2,469 (34%)	3,614 (50%)	1,121 (16%)	7,204	778,698	1 to 108
Northeast	1,741 (100%)	0 (0%)	0 (0%)	1,741	326,208	1 to 187
Northwest	1,030 (18%)	0 (0%)	4,632 (82%)	5,662	609,093	1 to 108
Southeastern	3,158 (67%)	0 (0%)	1,531 (33%)	4,689	529,002	1 to 113
Southwest	2,078 (21%)	1,953 (20%)	5,691 (59%)	9,722	949,292	1 to 98
West Central	275 (3%)	126 (1%)	10,306 (96%)	10,707	886,092	1 to 83
State	11,594	5,693	52,325	69,612	6,104,910	1 to 88

⁹³ American Community Survey (ACS) 1-year 2019 population estimates.

⁹⁴ Ibid 93.

Although there are significant numbers of nurses working in the primary care workforce, including 20.1% or 1,880 APRNs, the 2020 Missouri Nursing Workforce Report indicates that hospitals are the most common employment setting for RNs (58.5% or 45,807) and APRNs (43.6% or 2,173).⁹⁵ See Figure 12 (page 57) for the distribution of Trauma Centers and hospital beds by MAHEC region.

Unlike RNs and APRNs, LPN distribution does not follow the typical provider trends. LPNs tend to practice more often in rural areas than urban, likely due to differences in their employment setting. LPNs are most often working in long-term care settings such as nursing homes, extended care or assisted living facilities, where over one-third of LPNs (37.8% or 6,222) are employed. In Missouri, many of these facilities are located in rural areas.⁹⁶ See Figure 13 (page 58) for more information on long-term care facilities.

Table 16: Number and Percent of Rural, Partially Rural, and Urban Licensed Practical Nurse (LPN) by AHEC Region

AHEC Region	Rural # (%)	Partially Rural # (%)	Urban # (%)	Total LPN	Total Population	Ratio LPN to Population
East Central	260 (7%)	0 (0%)	3,517 (93%)	3,777	2,026,525	1 to 537
Mid-Missouri	1352 (53%)	835 (33%)	354 (14%)	2,541	778,698	1 to 306
Northeast	1,118 (100%)	0 (0%)	0 (0%)	1,118	326,208	1 to 292
Northwest	578 (35%)	0 (0%)	1,083 (65%)	1,661	609,093	1 to 367
Southeastern	1,603 (83%)	0 (0%)	330 (17%)	1,933	529,002	1 to 274
Southwest	765 (35%)	416 (19%)	1,015 (46%)	2,196	949,292	1 to 432
West Central	137 (7%)	125 (6%)	1,718 (87%)	1,980	886,092	1 to 448
State	5,813	1,376	8,017	15,206	6,104,910	1 to 401

⁹⁵ Missouri State Board of Nursing. (2021). *2020 Missouri Nursing Workforce Report*. Retrieved from <https://pr.mo.gov/boards/nursing/2020-workforce-report.pdf>.

⁹⁶ Ibid 95.

Missouri's Pharmacy Workforce

Tables 17 and 18 present 2021 pharmacist and pharmacy technician counts from Missouri Division of Professional Registration licensure data. These data also demonstrate skewed geographic distribution of the pharmacist workforce toward urban areas when compared to rural. This is especially concerning in Missouri due to the increasing number of residents aged 65+ in rural areas (see Figure 2 page 10). As Missourians age, they will require more access to pharmacists and pharmacy technicians. The Northeast AHEC region is impacted by pharmacist shortages with only 208 pharmacists licensed to provide services to an area population of 326,208. The licensed pharmacy technicians are better distributed between urban and rural areas of the state. The Southwest AHEC region offers an example of more equitable distribution of pharmacy technicians with 39% working in rural areas and 42% in urban. The US Bureau of Labor Statistics, Occupational Outlook Handbook provides data and trends for the Pharmacist profession. The need for pharmacists overall is expected to decrease by 2030; however, the pharmacist population is retiring and there are also expected to be 11,300 yearly job openings. The job market for pharmacy technicians is anticipated to grow by 2030, but the growth is much slower than for other health care professions.⁹⁷

Table 17: Number and Percent of Rural, Partially Rural, and Urban Pharmacists by AHEC Region

AHEC Region	Rural # (%)	Partially Rural # (%)	Urban # (%)	Total Pharmacists	Total Population ⁹⁸	Ratio Pharmacists to Population
East Central	90 (3%)	0 (0%)	3,009 (97%)	3,099	2,026,525	1 to 654
Mid-Missouri	302 (42%)	338 (48%)	71 (10%)	711	778,698	1 to 1,095
Northeast	208 (100%)	0 (0%)	0 (0%)	208	326,208	1 to 1,568
Northwest	119 (16%)	0 (0%)	645 (84%)	764	609,093	1 to 797
Southeastern	359 (73%)	0 (0%)	130 (27%)	489	529,002	1 to 1,082
Southwest	252 (27%)	162 (17%)	533 (56%)	947	949,292	1 to 1,002
West Central	20 (2%)	20 (2%)	850 (96%)	890	886,092	1 to 996
State	1,350	520	5,238	7,108	6,104,910	1 to 859

⁹⁷ US Bureau of Labor Statistics. (n.d.) *Occupational Outlook Handbook*. Retrieved from <https://www.bls.gov/ooh/>.

⁹⁸ American Community Survey (ACS) 1-year 2019 population estimates.

Table 18: Number and Percent of Rural, Partially Rural, and Urban Pharmacy Technicians by AHEC Region

AHEC Region	Rural # (%)	Partially Rural # (%)	Urban # (%)	Total Pharmacy Technicians	Total Population ⁹⁹	Ratio Pharmacy Technician to Population
East Central	362 (4%)	0 (0%)	8,184 (96%)	8,546	2,026,525	1 to 237
Mid-Missouri	1,295 (59%)	669 (31%)	226 (10%)	2,190	778,698	1 to 356
Northeast	1,019 (100%)	0 (0%)	0 (0%)	1,019	326,208	1 to 320
Northwest	480 (25%)	0 (0%)	1,460 (75%)	1,940	609,093	1 to 314
Southeastern	1,740 (85%)	0 (0%)	307 (15%)	2,047	529,002	1 to 258
Southwest	1,193 (39%)	553 (18%)	1,286 (42%)	3,032	949,292	1 to 313
West Central	115 (5%)	95 (4%)	2,076 (91%)	2,286	886,092	1 to 388
State	6,204	1,317	13,539	21,060	6,104,910	1 to 290

Missouri's Physical Therapy Workforce

Tables 19 and 20 present 2021 physical therapist (PT) and physical therapy assistant (PTA) counts from Missouri Division of Professional Registration licensure data. The distribution of PTs varies from AHEC region to AHEC region. East Central, Northwest, and West Central AHEC regions show definite skewing toward urban regions; however, both the Southeastern and Mid-Missouri AHEC regions indicate that their PTs tend to work in rural areas. At the state level, distribution of PTAs seems to follow the pattern of skewing toward urban areas; however, there are equitable numbers of PTAs distributed across the rural, partially rural, and urban areas of the Southwest AHEC region. Missouri's total PTs outnumber PTAs by a ratio of 2 to 1. According to the US Bureau of Labor Statistics Occupational Outlook Handbook, the need for both PTs and PTAs will grow faster than other occupations by 2030.¹⁰⁰ Analysis by the American Physical Therapy Association's (APTA) provide a contrasting view, projecting that there will be a surplus of PTs by 2030. The APTA did not make a projection for PTAs by 2030 and stated that there was insufficient data for their methodology.¹⁰¹

⁹⁹ American Community Survey (ACS) 1-year 2019 population estimates.

¹⁰⁰ US Bureau of Labor Statistics. (n.d.) *Occupational Outlook Handbook*. Retrieved from <https://www.bls.gov/ooh/>

¹⁰¹ American Physical Therapy Association. (December 2020) *APTA Physical Therapy Workforce Analysis*. Retrieved from <https://www.apta.org/contentassets/5997bfa5c8504df789fe4f1c01a717eb/apta-workforce-analysis-2020.pdf>

Two issues that may impact the need for PTs and PTAs are the opioid epidemic and the aging population. Figure 2 (page 10) shows the distribution of 65+ throughout the state. As the Missouri population ages, it is likely that their need for physical therapy services will increase. Additionally, there is also a widespread need for non-addictive alternatives to treat pain with one survey finding 78 percent of Americans they surveyed preferred drug-free pain management to opioids.¹⁰² Physical therapy is one such option that can provide education on pain and pain management as well as effective treatment.

Table 19: Number and Percent of Rural, Partially Rural, and Urban Physical Therapists by AHEC Region

AHEC Region	Rural # (%)	Partially Rural # (%)	Urban # (%)	Total Physical Therapists	Total Population ¹⁰³	Ratio Physical Therapists to Population
East Central	56 (4%)	0 (0%)	1,535 (96%)	1,591	2,026,525	1 to 1,274
Mid-Missouri	121 (30%)	206 (52%)	70 (18%)	397	778,698	1 to 1,961
Northeast	97 (100%)	0 (0%)	0 (0%)	97	326,208	1 to 3,363
Northwest	40 (13%)	0 (0%)	258 (87%)	298	609,093	1 to 2,044
Southeastern	143 (68%)	0 (0%)	67 (32%)	210	529,002	1 to 2,519
Southwest	105 (26%)	76 (19%)	229 (56%)	410	949,292	1 to 2,315
West Central	17 (3%)	14 (2%)	542 (95%)	573	886,092	1 to 1,546
State	579	296	2,701	3,576	6,104,910	1 to 1,707

¹⁰² Mintken, Paul E., Moore, Jeff R., Flynn, Timothy W. (April 30, 2018) *Physical Therapists' Role in Solving the Opioid Epidemic*. Retrieved from <https://www.jospt.org/doi/10.2519/jospt.2018.0606>

¹⁰³ American Community Survey (ACS) 1-year 2019 population estimates.

Table 20: Number and Percent of Rural, Partially Rural, and Urban Physical Therapy Assistants by AHEC Region

AHEC Region	Rural # (%)	Partially Rural # (%)	Urban # (%)	Total Physical Therapy Assistants	Total Population ¹⁰⁴	Ratio Physical Therapy Assistants to Population
East Central	14 (5%)	0 (0%)	295 (95%)	309	2,026,525	1 to 6,558
Mid-Missouri	74 (49%)	41 (27%)	35 (23%)	150	778,698	1 to 5,191
Northeast	58 (100%)	0 (0%)	0 (0%)	58	326,208	1 to 5,624
Northwest	54 (32%)	0 (0%)	113 (68%)	167	609,093	1 to 3,647
Southeastern	122 (80%)	0 (0%)	31 (20%)	153	529,002	1 to 3,458
Southwest	64 (33%)	56 (29%)	73 (38%)	193	949,292	1 to 4,919
West Central	9 (5%)	8 (5%)	157 (90%)	174	886,092	1 to 5,092
State	395	105	704	1,204	6,104,910	1 to 5,071

Missouri's Community Health Worker Workforce

Community Health Workers (CHWs) are a relatively new workforce in the US and Missouri. CHWs provide frontline public health services in their own communities and serve as liaisons between health care and social service providers and the communities they serve. CHWs serve in both formal and informal capacities and can be employees or volunteers.¹⁰⁵ In Missouri, CHWs can be credentialed through the Missouri Credentialing Board, and Table 21 presents the most current counts of credentialed CHWs in Missouri. Currently, there are 208 credentialed CHWs in the state. No AHEC Region appears to have sufficient CHWs to serve the people of their regions. The Missouri Department of Health and Senior Services (DHSS) lists eight educational programs that provide the CHW curriculum regulated by DHSS; educational access and pathways to certification may present one potential bottleneck for the shortage of CHWs in the state. Demand for CHWs is anticipated to grow due to expanding healthcare coverage through the Affordable Care Act and Medicaid expansion, as well as the growth in Missourians over the age of 65 (see Figure 2 page 10).

¹⁰⁴ American Community Survey (ACS) 1-year 2019 population estimates.

¹⁰⁵ National Institute for Healthcare Management Foundation. (April 7, 2021) *Community Health Workers: Their Important Role in Public Health*. Retrieved from <https://nihcm.org/publications/community-health-workers-infographic>.

Table 21: Number and Percent of Rural, Partially Rural, and Urban Community Health Workers (CHW) by AHEC Region

AHEC Region	Rural # (%)	Partially Rural # (%)	Urban # (%)	Total CHW	Total Population	Ratio CHW to Population
East Central	0 (0%)	2 (3%)	65 (97%)	67	2,026,525	1 to 30,247
Mid-Missouri	8 (42%)	11 (58%)	0 (0%)	19	778,698	1 to 40,984
Northeast	0 (0%)	12 (100%)	0 (0%)	12	326,208	1 to 27,184
Northwest	0 (0%)	0 (0%)	12 (100%)	12	609,093	1 to 50,758
Southeastern	0 (0%)	20 (100%)	0 (0%)	20	529,002	1 to 26,450
Southwest	6 (20%)	8 (27%)	16 (53%)	30	949,292	1 to 31,643
West Central	6 (13%)	0 (0%)	42 (88%)	48	886,092	1 to 18,460
State	20	53	135	208	6,104,910	1 to 29,351

Missouri’s Public Health Workforce

Based in a variety of organizations that are part of a diverse and complex system, the public health workforce promotes and protects the health of communities.¹⁰⁶ According to the American Public Health Association (APHA), there are ten essential public health services, including assessment and surveillance activities, education, information sharing, promoting community health and disease prevention, policy analysis, research and innovation, and maintaining a strong public health infrastructure.¹⁰⁷

These essential health services further define core competencies for public health professionals, organized into eight domains within public health, including data analytics and assessment, policy development and program planning, communication, health equity, community partnership, public health sciences, management and finance, and leadership and systems thinking.¹⁰⁸

Missouri has a decades-long history of efforts to transform the public health system, including recent grassroots efforts by the #HealthierMO Initiative (HealthierMO) to

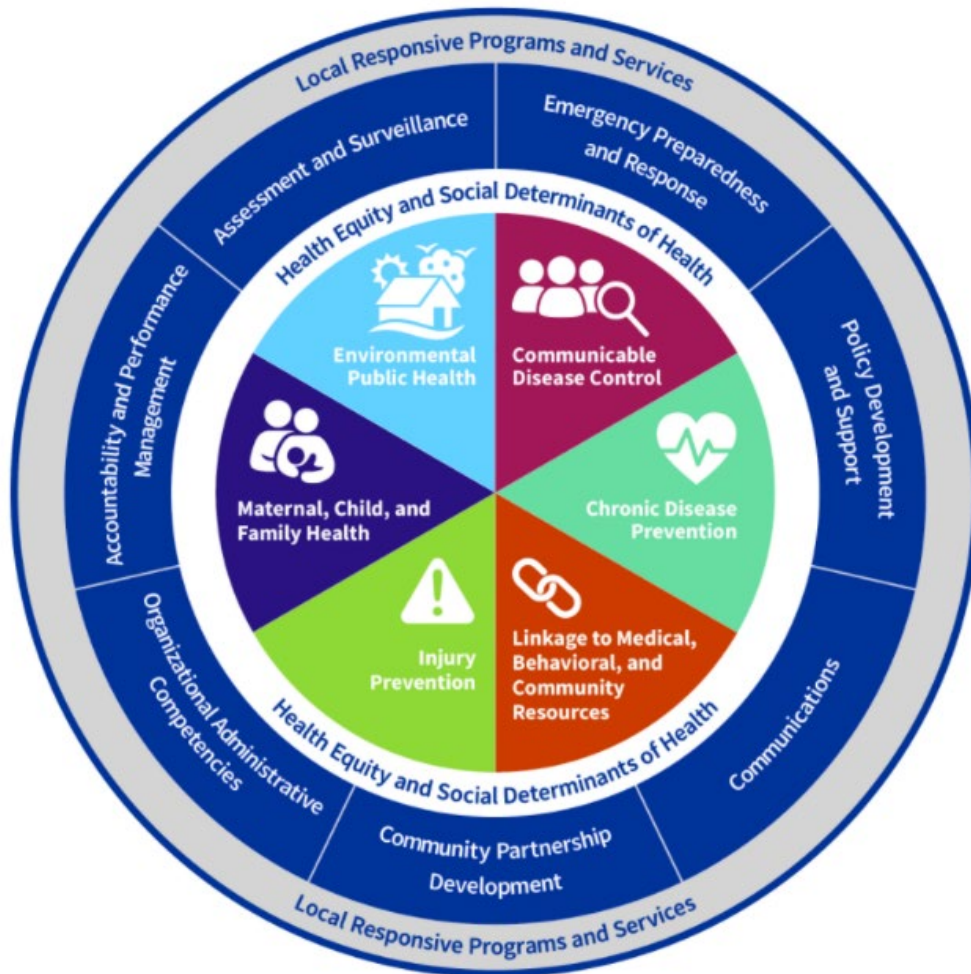
¹⁰⁶ American Public Health Association. (2022, February 17). *What Is Public Health*. Retrieved from APHA.org: <https://www.apha.org/What-is-Public-Health>.

¹⁰⁷ American Public Health Association. (2022, February 17). *10 Essential Public Health Services*. Retrieved from APHA.org: <https://www.apha.org/What-is-Public-Health/10-Essential-Public-Health-Services>.

¹⁰⁸ Public Health Foundation. (2022, February 17). *Core Competencies for Public Health Professionals: Domains*. https://www.phf.org/programs/corecompetencies/Pages/Core_Competerencies_Domains.aspx.

develop a Foundational Public Health Services (FPHS) model specifically for Missouri.¹⁰⁹ The resulting model includes six areas of expertise and seven capabilities, each defined by its own list of activities.¹¹⁰ See Figure 9 for a visual representation of the model. A report of Healthier MO’s model development process and assessment is available in *A Summary of Missouri’s Public Health System Capacity to Deliver the Missouri Foundational Public Health Services Model* https://www.healthiermo.org/files/ugd/9bd019_f678e32c6fa24128958b9280f5f03450.pdf.

Figure 9: The Foundational Public Health Services model.



Note: Areas are depicted in the pie slices in the middle section of the graphic, while capacities are represented in the outer, dark blue ring.

¹⁰⁹ Missouri Public Health Association. (2022, February 17). *Missouri's FPHS Model - An Overview*. Retrieved from HealthierMO: <https://clphs.health.mo.gov/lphs/pdf/fphs-overview.pdf>.

¹¹⁰ Daniel, T. (2021, June 11). *A Summary of Missouri’s Public Health System Capacity to Deliver the Missouri Foundational Public Health Services Model*. https://www.healthiermo.org/files/ugd/9bd019_f678e32c6fa24128958b9280f5f03450.pdf.

While the public health workforce can be found in settings as diverse as community organizations, health care systems and the private sector, workforce data are often focused on public employees at state departments of health or local public health agencies (LPHAs). Nationally, public health spending makes up a falling share of total health expenditures. Specifically, public health's share of total health spending fell from 3.18% in 2002 to 2.65% in 2014.¹¹¹ It is projected to continue to fall to 2.4% in 2023. In 2020, Missouri spent the lowest per person on public health among all states.¹¹²

One of the consequences of budget constraints is fewer staff members in state and local health departments. Nationally, state health departments shed 10,000 positions, a 10% decrease between 2012 and 2019.¹¹³ In the same time period, positions at Missouri Department of Health and Senior Services decreased by 6.5%, or about 118 jobs.¹¹⁴ Between 2018 and 2028, the overall state government workforce is projected to decrease by an additional 1.7 percent.¹¹⁵ Like state-level public health departments, LPHA staff throughout the United States are declining in numbers. From 2008 to 2018, local health departments eliminated more than 56,000 jobs.¹¹⁶ In a 2017 survey of public-health workers, almost half (47%) stated they planned to leave the workforce or retire in the next five years.¹¹⁷

The COVID-19 pandemic has led to further reduction in this workforce. For example, several LPHA directors in Missouri resigned or otherwise left their jobs in the wake of threats and harassment related to political controversies regarding the response to the pandemic.¹¹⁸ HealthierMO reported in June 2021 that 22 LPHA directors in Missouri retired or left their position (19% turnover), and one-quarter of LPHAs (25%) had a leadership change since the

¹¹¹ Himmelstein, D. U., & Woolhandler, S. (2016). Public Health's Falling Share of US Health Spending. *American journal of public health*, 106(1), 56–57. <https://doi.org/10.2105/AJPH.2015.302908>

¹¹² State Health Access Data Assistance Center, University of Minnesota. (2021, February 9). *SHADAC Analysis of Per Person State Public Health Funding*. Retrieved from State Health Compare: <http://statehealthcompare.shadac.org/>

¹¹³ Association of State and Territorial Health Officials. (2019). *Profile of State and Territorial Health*. Retrieved from Association of State and Territorial Health Officials: <https://www.astho.org/profile>

¹¹⁴ Ibid 113.

¹¹⁵ Center for State & Local Government Excellence. (2020, March). *How Does the Public Health Workforce Compare with the Broader Public Sector?* Retrieved from de Beaumont: <https://debeaumont.org/wp-content/uploads/2020/03/FINAL-SLGE.pdf>

¹¹⁶ National Association of County and City Health Officials. (2018). *Forces of Change Survey 2018*. Retrieved from National Association of County and City Health Officials: <https://www.naccho.org/uploads/downloadable-resources/2018-Forces-of-Change-Main-Report.pdf>

¹¹⁷ McKinsey & Company. (2022, February 2). *Building the US public-health workforce of the future*. Retrieved from McKinsey & Company: <https://www.mckinsey.com/industries/public-and-social-sector/our-insights/building-the-us-public-health-workforce-of-the-future>

¹¹⁸ See: Munz, M. (2020, October 30). *Health department directors across Missouri have left jobs, face threats and harassment*. Retrieved from St. Louis Post-Dispatch: https://www.stltoday.com/lifestyles/health-med-fit/coronavirus/health-department-directors-across-missouri-have-left-jobs-face-threats-and-harassment/article_fa61a8fb-80dc-55f0-90fa-5a226c054667.html; Patrick, R. (2021, April 4). *St. Charles County health director to leave in May*. Retrieved from St. Louis Post-Dispatch: https://www.stltoday.com/lifestyles/health-med-fit/coronavirus/st-charles-county-health-director-to-leave-in-may/article_184688ef-1930-510d-ab9f-f859774bf64b.html; KMBC. (2021, May 4). *Dr. Rex Archer, Kansas City's top health official, retiring on Aug. 1*. Retrieved from KMBC News: <https://www.kmbc.com/article/dr-rex-archer-kansas-citys-missouri-top-health-official-retiring/36332371#>

start of the COVID-19 pandemic.¹¹⁹ Missouri is not alone in the turnover of public health directors. A review of news accounts found at least 27 state and local health leaders in 13 different states resigned, retired or were fired between April and June of 2020.¹²⁰

The impacts of health director turnover may have long term consequences for public health. Regional analysis by HealthierMO found that LPHAs led by directors with less than two years of experience were less likely to self-identify as meeting the capabilities set out in Missouri’s FPHS model described above.¹²¹ Examples of capabilities include organizational administrative competencies, assessment and surveillance, and community partnership development. Possible mitigation strategies for new LPHA directors include training and mentoring.

Effects of funding and staff shortfalls may not yet be fully realized, as the pandemic presents potentially lasting effects on population health (such as mental health conditions) and setbacks in other public health priorities (such as addressing the opioid crisis).¹²² However, Missouri’s allocation from the American Rescue Plan Act of 2021, about \$2.68 billion in federal relief funding,¹²³ may help fill the gap. These funds can be used for several initiatives related to public health, including enhancing public health data systems and communication efforts.¹²⁴

Hiring additional staff at all levels was the highest need identified by LPHAs in their effort to meet every foundational area of capabilities and expertise included in Missouri’s FPHS model.¹²⁵ For example, “linkage to medical, behavioral and community resources” is one of the foundational areas of expertise in the model. Among LPHAs who report they are unable to assure their ability to link with other health care and community services, nearly two-thirds (62.6%) indicated that they needed to hire more people with this expertise. Training and support for existing staff on how to link to other healthcare and community services were identified as additional needs by 15.8% and 11.6%, respectively.¹²⁶

In conclusion, the expertise held by LPHAs to link with medical, behavioral and community resources highlights an important role for the public health workforce in Missouri’s health care workforce landscape. In the context of this needs assessment and gap analysis, this underscores the importance of integrating the public health workforce into MAHEC’s efforts to increase availability as well as Missourian’s access to high quality health care services throughout the state.

¹¹⁹ Ibid 109.

¹²⁰ Weber, L., Barry-Jester, A., & Smith, M. R. (2020, June 12). *Public Health Officials Face Wave Of Threats, Pressure Amid Coronavirus Response*. Retrieved from Kaiser Health News: <https://khn.org/news/public-health-officials-face-wave-of-threats-pressure-amid-coronavirus-response/>

¹²¹ Ibid 110.

¹²² DeSalvo, K., B. Hughes, M. Bassett, G. Benjamin, M. Fraser, S. Galea, N. Garcia, and J. Howard. (2021). *Public Health COVID-19 Impact Assessment: Lessons Learned and Compelling Needs*. *NAM Perspectives*. Discussion Paper, National Academy of Medicine, Washington, DC. <https://doi.org/10.31478/202104c>

¹²³ US Department of the Treasury. (2022, Feb 9). *Coronavirus State and Local Fiscal Recovery Funds: Allocation for States*. Retrieved from US Department of the Treasury: <https://home.treasury.gov/system/files/136/fiscalrecoveryfunds-statefunding1-508A.pdf>

¹²⁴ State of Missouri Office of Administration. (2022, February 9). *Public Health Funding Toolkit*. Retrieved from State of Missouri Office of Administration: <https://oa2.mo.gov/ARPAtoolkits/public-health>

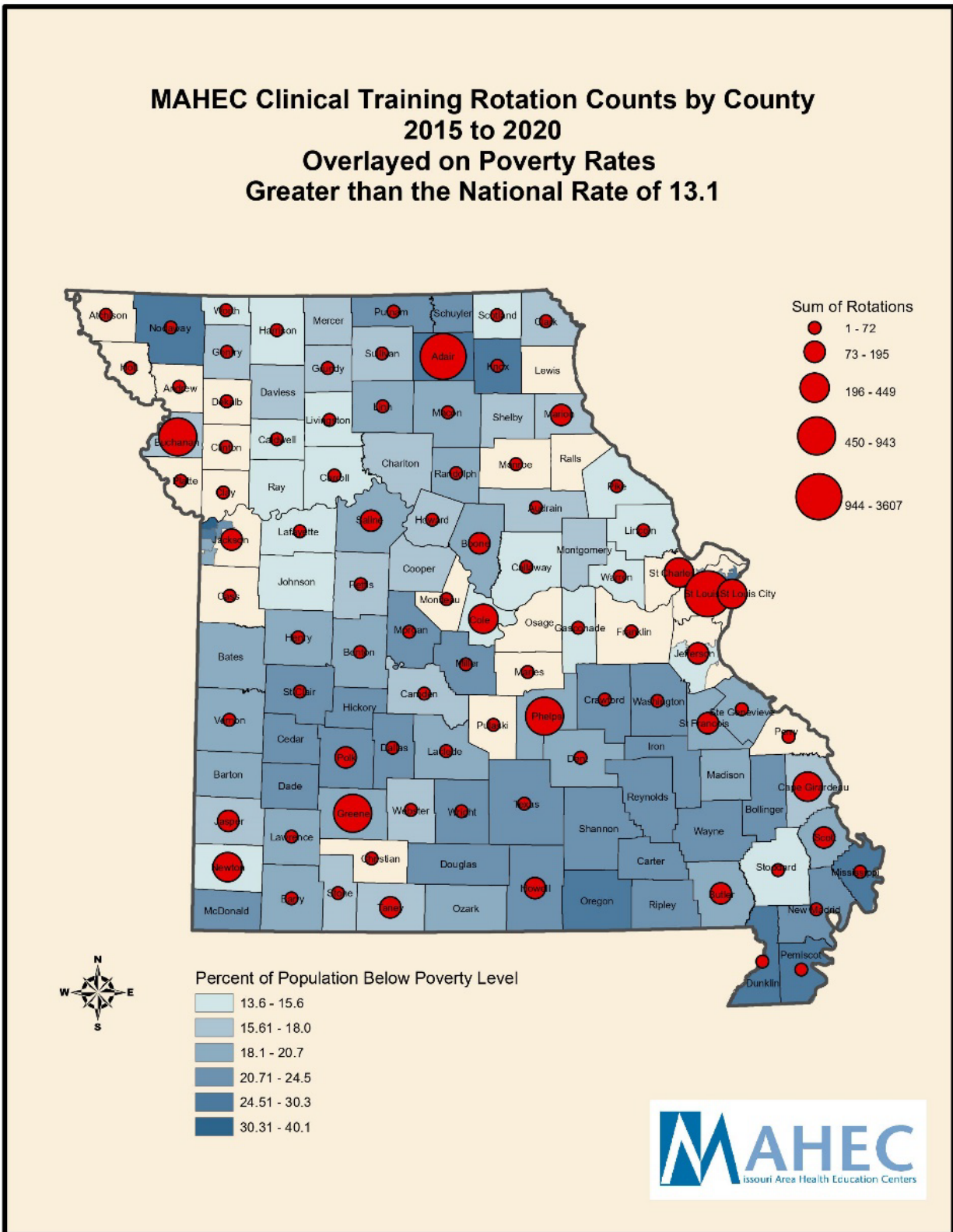
¹²⁵ Ibid 110.

¹²⁶ Ibid 110.

MAHEC Clinical Training and Pipeline Programs

Figure 10 presents the distribution of clinical training rotations that MAHEC staff coordinated for a variety of healthcare provider-types from 2015 to 2020. This map overlays a map of the distribution of the population by poverty level. It is important to note that the blue shaded counties represent poverty levels higher than (i.e., worse than) the national poverty rate of 13.1. The tan shaded counties have poverty levels lower than (i.e., better than) the national poverty rate of 13.1. Figure 10 highlights the importance placed on meeting the healthcare needs of all those living in Missouri especially the most vulnerable.

Figure 10: MAHEC Clinical Training Rotation Counts by County, 2015-2020



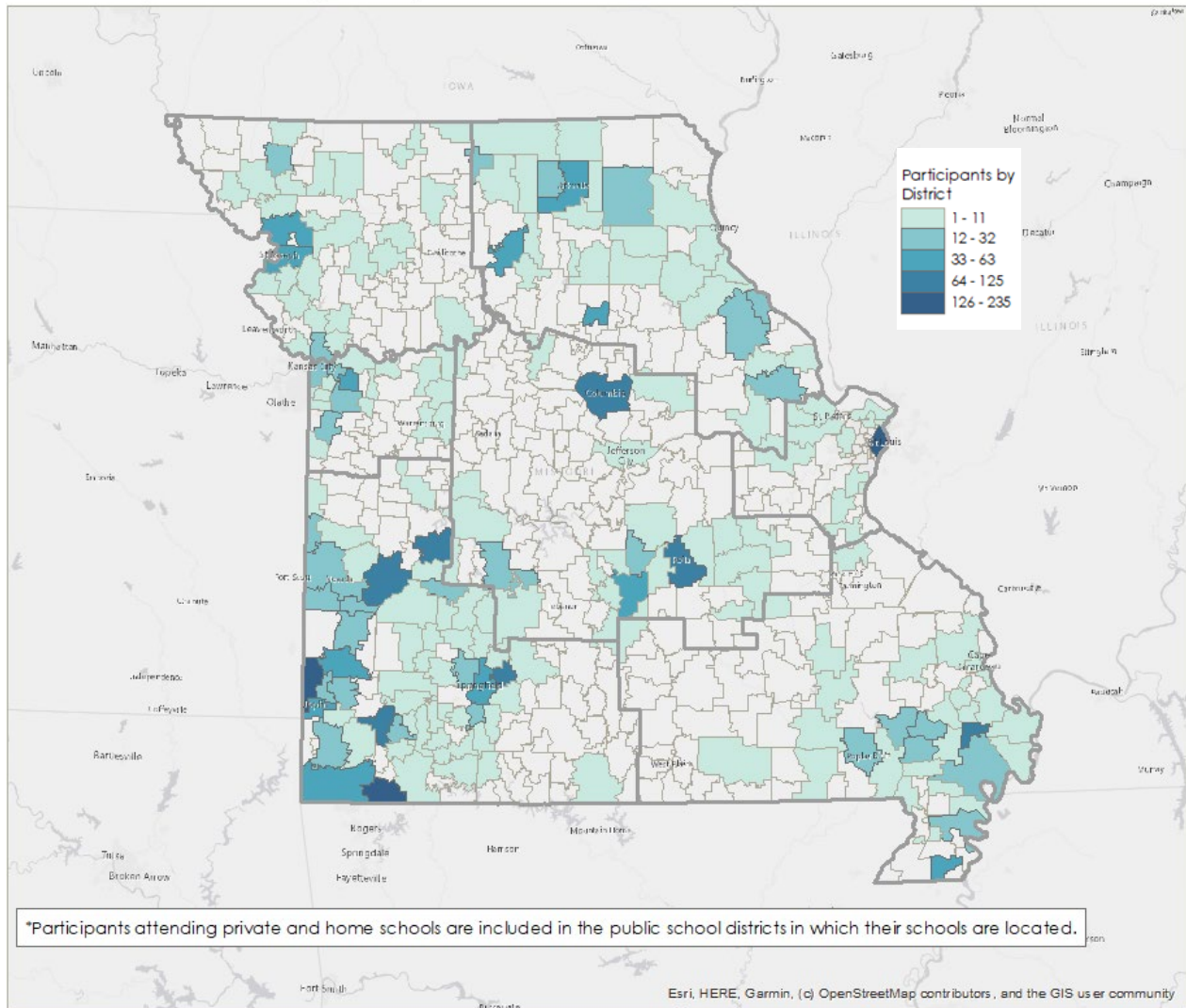
Building interest in health care careers during K-12 education is an important step in meeting future health care workforce needs, though HRSA limits spending on pipeline programming to no more than 10% of federal grant money. This greatly limits MAHEC's ability to reach additional students due to limitations on staff and travel costs to reach this age group.

Figure 11 displays the number of students by school district participating in AHEC-sponsored health care workforce pipeline programs since 2015. Missouri school districts across the state could benefit from more extensive programming to build student interest and readiness for health care careers. Over the past five years, vast rural portions of the state report no student participation in pipeline activities, including many rural communities with hospitals, RHCs, FHQCs, and other potential sites for career-oriented programming. For rural school districts that did have pipeline activity, participation was often extremely limited (under 12 students). Participation levels are greater in or around communities with AHEC regional offices and/or higher education campuses. Pipeline programs could be extended further throughout entire regions. The Southwest AHEC region presents the greatest pipeline activity among regions, while rural school districts throughout major portions of the Southeastern and Mid-Missouri regions had no activity.

Several Medically Underserved Areas/Populations could benefit from K-12 health care workforce pipeline programming. An absence of pipeline activity is noted within the state's only designated MUP-Governor's Exception territory (St. Charles County). As designated MUPs, Dent and Lafayette counties also had extremely limited or no student involvement. School districts in Phelps, Boone, and Buchanan counties with larger student populations report slightly more involvement, with between 33 and 63 students having some exposure to health care careers through AHEC pipeline activities.

High school and community college partnerships could provide pathways to entry level health care careers, including LPN and CHW programs.

Figure 11: MAHEC Pipeline Participants by School District, 2015-2020



Health Care Infrastructure

Primary care, oral health, and mental and behavioral health care, and the workforce needed to deliver services, are all important aspects of Missouri's health care landscape. Infrastructure is another important piece. FQHCs and Rural Health Clinics are covered earlier in the needs assessment, though it is also important to consider hospitals, long-term care facilities and even broadband access when examining Missouri's health care infrastructure.

Hospitals

Figure 12 displays the geographic location and distribution of hospitals across the Show-Me State, along with rates of total beds per 10,000 population. Trauma Level I hospitals serve as comprehensive tertiary care facilities for their region and offer the most specialized services for every aspect of injury care. Four metropolitan areas of the state (Kansas City, Columbia, St. Louis, and Springfield) have Level I hospitals. Three of the seven AHEC regions are without a Level I care hospital (Northwest, Northeast, and Southeastern regions). Level II hospitals are able to provide initial treatment for all injuries, though some patients may need to be transferred to a Level I facility. Three regions do not have a Level II care hospital (Northeast, Southeastern, and Mid-Missouri regions). Level III Trauma Centers have the ability to assess, resuscitate and stabilize patients, and have transfer agreements with Level I and II hospitals. Northwest is the only AHEC region without a Level III care hospital. Numerous "deserts" are visible throughout interior regions of the state, as rural residents face increased drive times and cost to access care, and emergency responders may need to cross two or more county lines to connect patients with life-saving care.

Rates of total hospital beds per 10,000 population differ by more than 30 beds between regions. East Central (48.27) and West Central (40.04) AHEC regions boast the highest bed rates, with Southeastern (38.85) and Southwest (36.87) regions following not far behind. Northeast AHEC region has the lowest rate at just 16.12 total beds for every 10,000 of the region's population. Mid-Missouri and Northwest region hospitals have between 20 and 30 beds for every ten thousand residents.

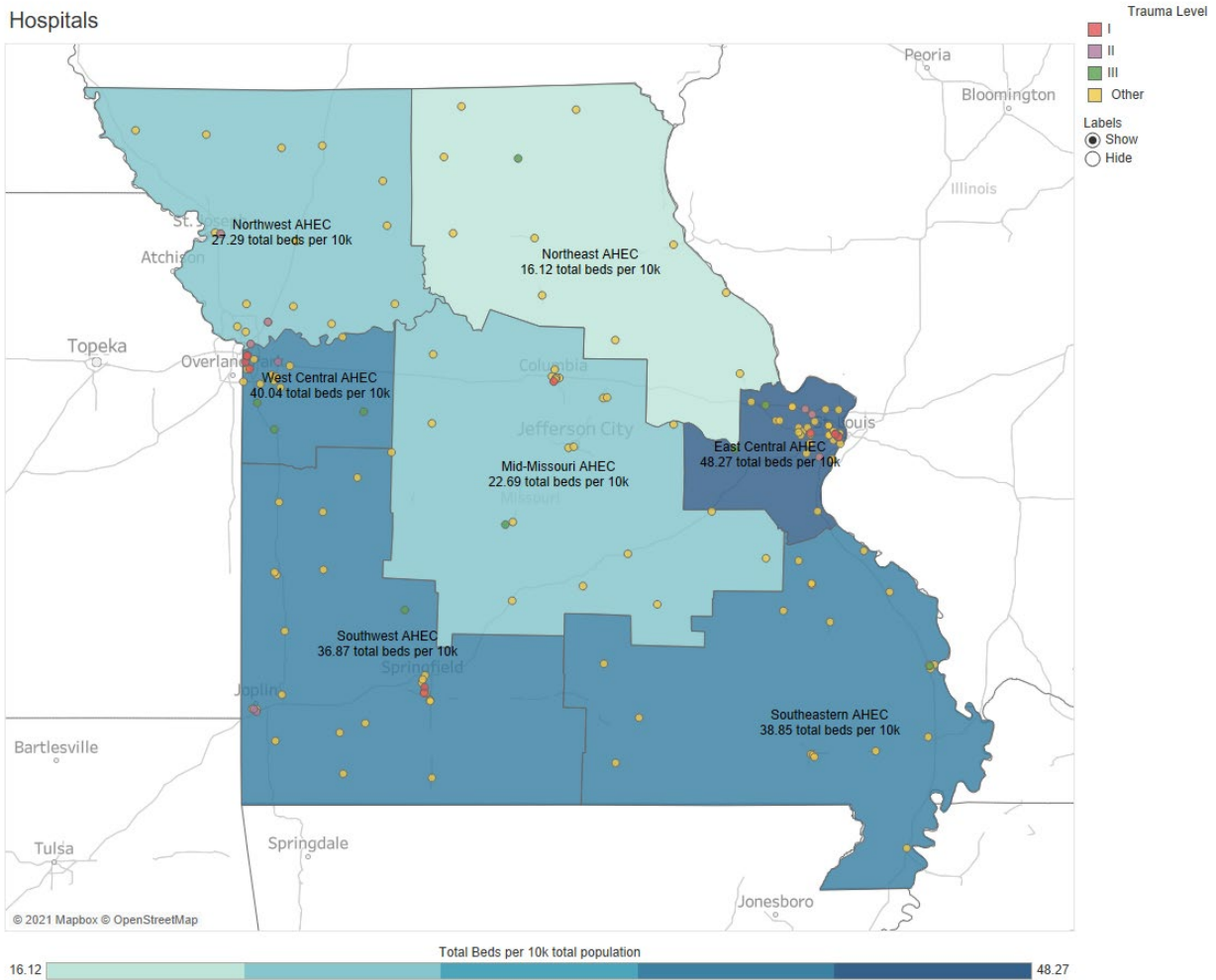
Critical access hospitals provide an important source of care, particularly in rural areas. Missouri currently has 35 critical access hospitals.¹²⁷

Missouri has been plagued with a significant number of hospital closures in the recent past. According to the Missouri Hospital Association, Missouri has closed 15 hospitals since 2014, including ten rural hospitals and nine acute care hospitals.¹²⁸

¹²⁷Missouri Department of Health and Senior Services. (January 3, 2022) *Critical Access Hospitals in Missouri*. Retrieved from <https://health.mo.gov/safety/healthservregs/pdf/CAHhosp.pdf>.

¹²⁸ Missouri Hospital Association. (January 2020) *15 Hospital Closures in Missouri*. Retrieved from https://www.mhanet.com/mhaimages/advocacy/Missouri-Hospital_Closures_0120.pdf.

Figure 12: Hospitals and Total Beds Per 10,000 Population by AHEC Region

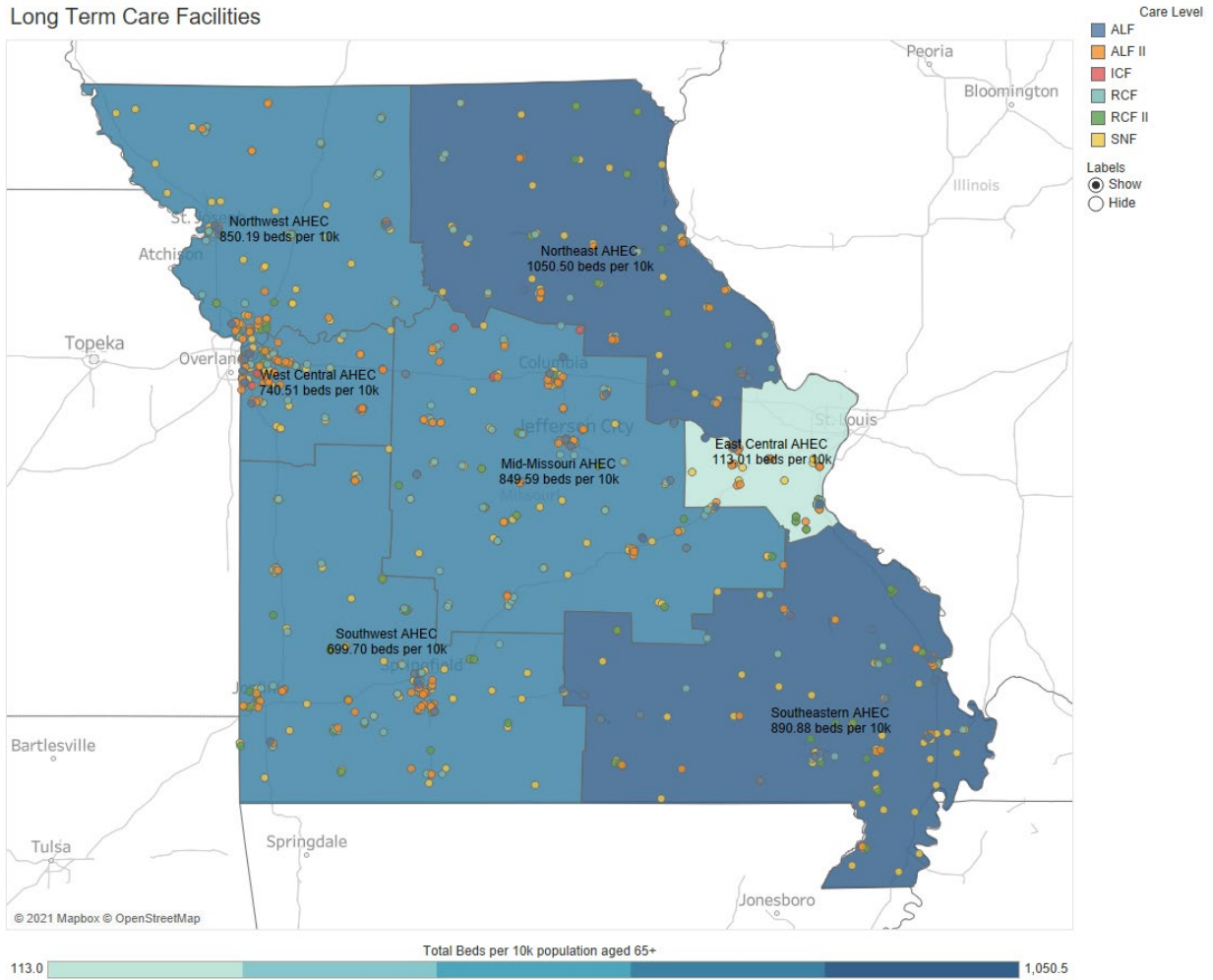


Note: “Other” includes all hospitals that are not designated as Trauma Level I, II or III Centers, including psychiatric and rehabilitation hospitals.

Long-Term Care Facilities

Figure 13 provides a visualization of long-term care facilities by AHEC region, based on the rate of long-term care beds per 10,000 population age 65 or older. Bed rates differ between regions, with rural regions having greater long-term care capacity compared to their more densely populated urban counterparts. The Northeast AHEC region has the most favorable rate with 1050.50 beds per 10,000 population age 65 or older. Southeastern, Northwest, and Mid-Missouri regions each have between 800 and 900 beds available for every 10,000 residents age 65 and older. West Central (740.51) and Southwest (699.70) regions follow. By far, the lowest long-term care bed rate is the St. Louis area (East Central region) with one-tenth of the Northeast region’s ratio at just 113.01.

Figure 13: Long-Term Care Facilities and Total Beds Per 10,000 Population Age 65+ by AHEC Region



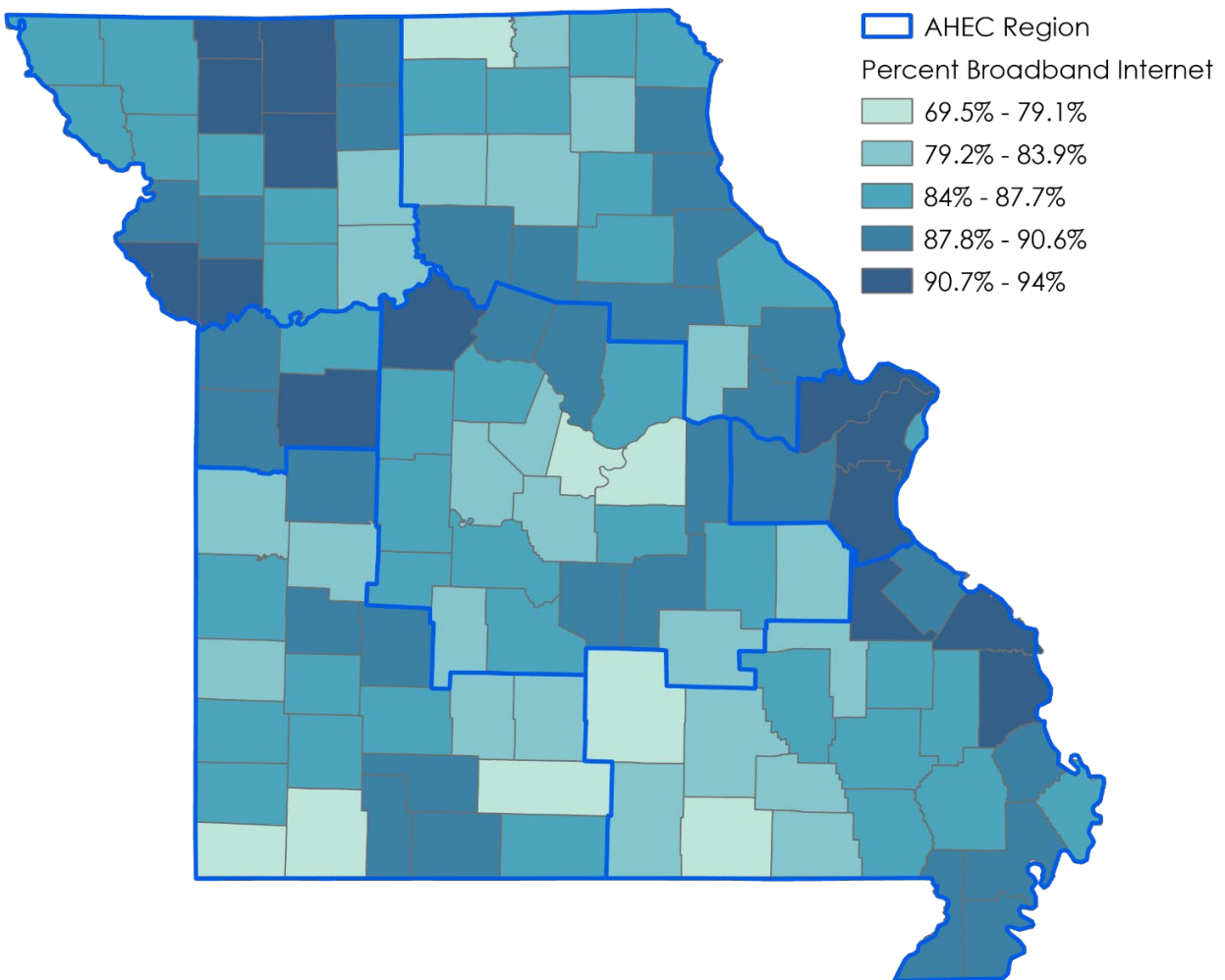
Note: Age 65 and older was used as the age category of interest due to Medicare eligibility. Care levels include:

- ALF: Assisted Living Facility
- ALF II: Assisted Living Facility with additional requirements for evacuation assistance
- ICF: Intermediate Care Facility
- RCF: Residential Care Facility
- RCF II: Residential Care Facility requiring a licensed Nursing Home Administrator
- SNF: Skilled Nursing Facility

Broadband Access

Telehealth coverage and utilization was greatly expanded during the COVID-19 pandemic. Many of these policy changes may become permanent as a means to increase health care access across.¹²⁹ Thus, broadband access is an important piece of health care infrastructure. Figure 14 displays the percentage of households with a broadband internet subscription at the county level. Unfortunately, many of the counties with low percentages of broadband at home, shown below with lighter colored shading, also have a low number of health care providers and facilities. One potential solution is extending the audio-only telehealth options introduced during the pandemic, allowing those without broadband internet to access some care with their phone line.

Figure 14: Percentage of Households with a Broadband Internet Subscription



Source: American Community Survey, 2015-2019
Created by: Center for Health Policy, University of Missouri

¹²⁹ Koma, W., Cubanski, J., and Neuman, T. (n.d.) *Medicare and Telehealth: Coverage and Use During the COVID-19 Pandemic and Options for the Future*. Retrieved from <https://www.kff.org/medicare/issue-brief/medicare-and-telehealth-coverage-and-use-during-the-covid-19-pandemic-and-options-for-the-future>.



Missouri Area Health Education Centers Needs Assessment and Gap Analysis

By the University of Missouri Center for Health Policy and Missouri AHEC Program Office
at A.T. Still University-Kirksville College of Osteopathic Medicine

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