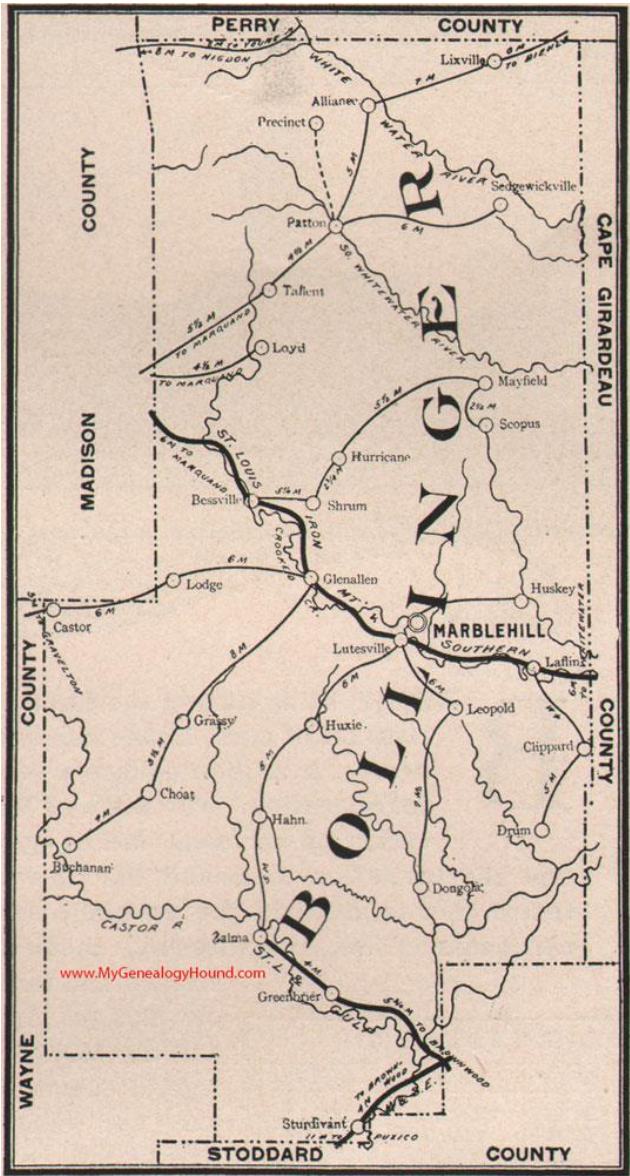


Bollinger County, Missouri



2022 Community Health Assessment Full Report

Community Health Assessment 2022

This assessment was commissioned by the Cape Girardeau Public Health Center in partnership with Bollinger County Health Center.

Bollinger County Health Center
107 HWY 51 North
Marble Hill, MO 63764



Mission: *To provide health protection and promotion to prevent disease, injury, and disability for Bollinger County.*

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Cover Image:

Prepelka, B. (n.d.). *Bollinger Mill State Historic Site* [Image]. Missouri State Parks.

https://stateparks.com/bollinger_mill_state_historic_site_in_missouri.html

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About the Community Health Assessment

Purpose of this Report

This Community Health Assessment (CHA) details a collection of indicators used to measure the health and well-being of Bollinger County, Missouri. The CHA is part of a larger assessment effort, called a Community Health Profile, which also includes a Local Public Health Assessment (LPHSA), Community Themes and Strengths Assessment (CTSA), Forces of Change Assessment (FCA). The Community Health Profile is the assessment arm of the MAPP. The MAPP standards for Mobilization for Action in Partnerships and Planning. This document provides only the results of the CHA. A community health assessment (CHA) refers to "a state, tribal, local, or territorial health assessment that identified key health needs and issues through systematic, comprehensive data collection analysis" (Centers for Disease Control and Prevention, para. 1, 2018).

Background

This work is the result of a funding award received by Cape Girardeau County Public Health Center in Cape Girardeau, Missouri. The Missouri Department of Health and Senior Services (DHSS) received funding from the Centers for Disease Control and Prevention (CDC) National Initiative to Address COVID-19 Health Disparities Among populations and Rural Communities. The project is titled the Statewide Health Disparities Initiative. The local title of the project is the Health and Wellness Community Project. The timeline for the project is from May 2022 to May 2023. The partners for this project are Cape Girardeau Public Health Center and Bollinger County Health Department. The purpose of the CHA is to determine the existing inequities in Cape Girardeau County, Missouri compared to state and national levels. The CHA is an epidemiological survey of various indicators in the geographical community.

Methodology

For this project, a variety of data analysis tools will be used including Tableau Public and Excel®. Many resources are available to understand a community's strengths, challenges, and opportunities for improvement. A collection of 11 dimensions provides the depth necessary to plan for community health improvement. Figure 1 provides an overview of the dimensions and the specific indicators used to describe them. In Attachment A, example sources of secondary data for these health dimensions and indicators are provided.

Major Indicators of the Community Health Assessment

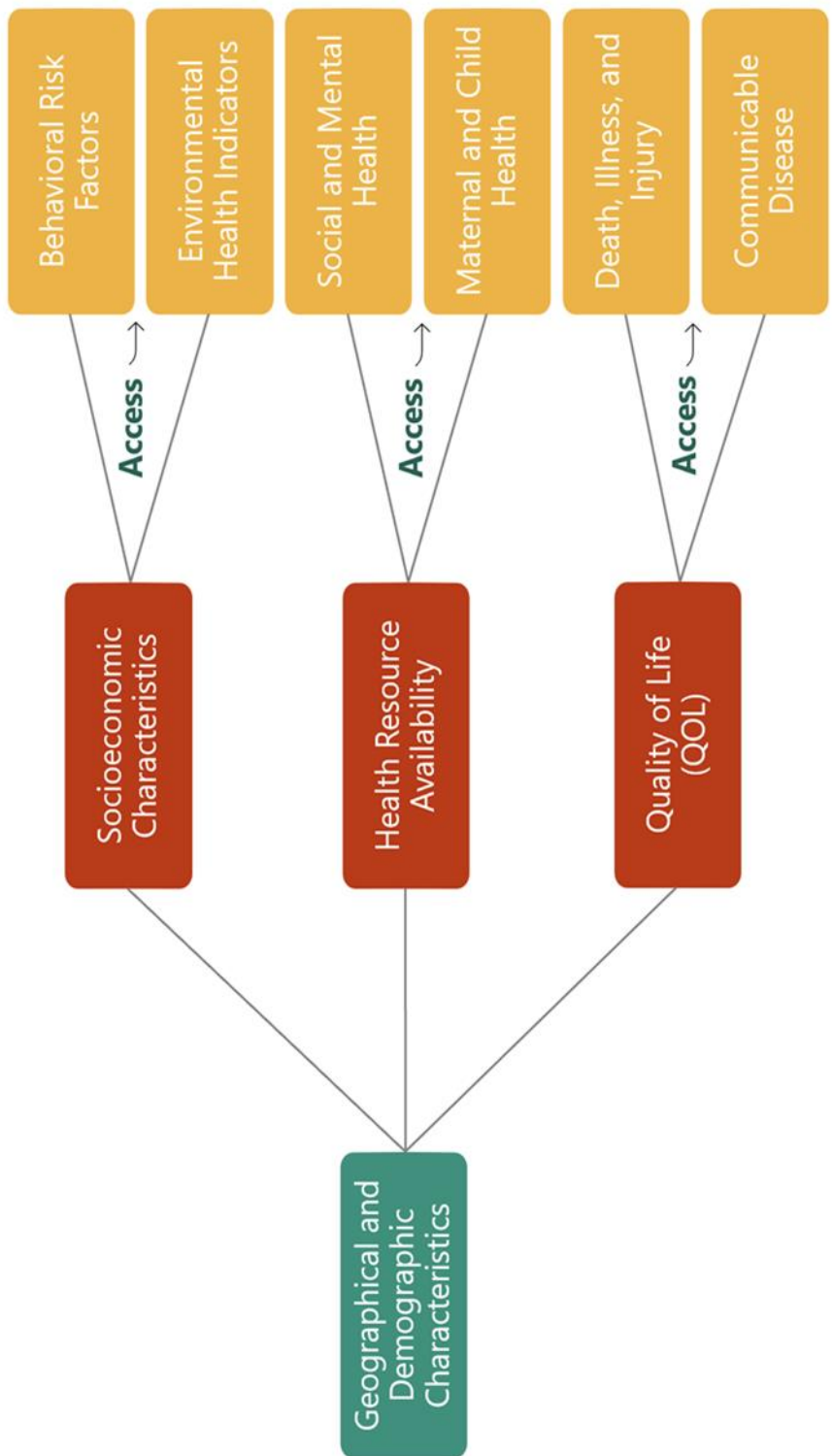


FIGURE 1

Metrics Used in this Report

Geographical and Demographic Characteristics

- Historical and Geographical Context
- Major Cities
- Population
- Population Trends
- Race and Ethnicity

Socioeconomic Characteristics

- Severe Housing Problems
- Employment
- Veteran Characteristics
- Income, Type of Worker and Commuting

Quality of Life (QOL)

- Poor health days
- Opportunity
- Incarceration

Behavioral Risk Factors

- Smoking
- Obesity
- Inactivity
- Excessive Drinking
- Alcohol-Impaired Driving Deaths
- Insufficient Sleep Quality

Health Resource Availability

- Shortage of Medical Personnel
- Healthcare facilities
- Health Insurance

Environmental Health Indicators

- Overall Physical Environment
- Water
- Driving Alone and Long Commute
- Traffic Volume
- Near Roadway and Industrial Pollution
- Energy Monitored by Environmental Protection Agency
- UV Index
- Toxic Chemical Release
- Social Vulnerability and Disaster

Social and Mental Health

- Social Associations
- Crime Offenses
- Crime by City
- Hate Crimes and Groups
- Frequent Poor Mental Distress
- Domestic Partner Violence
- Depression
- Deaths of Despair - Suicide, Alcohol-Related Disease Deaths, and Drug Overdoses

Maternal and Child Health

- Teen Births
- Infant and Child Mortality
- Single-Parent Household
- Homelessness
- Disconnected Youth, Reading and Math Scores
- Percentage in Free or Reduced Lunch

Death, Illness, and Injury

- Overall Health Factors and Health Outcomes
- Births and Deaths
- Death and Leading Causes
- Traffic Crashes Injury and Death
- Years of Potential Life Lost
- Preventable Hospital Stays

Communicable Disease

- Chlamydia Rates
- Human Immunodeficiency Virus (HIV)
- COVID-19

Access

- Food Environment
- Alcohol Establishments
- Income Inequality/Income Ratio
- Child Care Availability and Costs
- Internet Access
- Access to Various Services

Major Findings of the Community Health Assessment

Geographical and Demographic Characteristics

1. The 85 years and over is the smallest cohort, 1.9%, and 45 to 54 years is the largest cohort, 13.5%.
2. The population consists of those who identify as White (93%), Hispanic or Latino ethnicity (1.4%) followed by Black (0.3%) and Asian (0.2%) residents.

Socioeconomic Characteristics

3. Bollinger County is in Quartile 3 (next to worst) for social and economic factors including education levels, employment and income, family and social support, and community safety.
4. About 16% of residents are below the federal poverty level. The age cohort of 55 to 64 years has the highest percentage below federal poverty level at 51%.
5. Among those over 25 years, 46% have a high school graduate degree, while 21% have some college, but no degree. Around 88% of the total population, males, and females and any age cohort are a high school graduate. In all age cohorts, females had more bachelor's degrees than males, except for females 65 and over.
6. The lower the poverty status, the higher the educational attainment. Females have a higher percentage poverty than males for less than a high school degree. Although the poverty rate is lower for a bachelor's degree or higher, as education increases, males are at a higher poverty rate than females.
7. Bollinger County has 13% severe housing problems and is in the third quartile.
8. Fifty-four percent are in the labor force. The unemployment rate for civilians is 6%. Half of female over the age of 16 are in the labor force. Education and health care comprise 22% of the workforce.
9. There are 911 veterans in the county (about 9.6%). More veterans are male (86%), White (93%), and at or above the FPL (93%). Under three fourths are without a disability (64%). Most veterans served in the Vietnam era. Age cohorts for veterans are 65 to 74 years (30%), 75 years or more (27%), and 35 to 54 years (25%). Most have a high

school degree (58%), followed by some with a college or associate degree (28%), or a bachelor's degree or higher (8%).

10. The highest income category for the county is \$50,000 to \$74,999, followed by \$75,000 to \$99,999. Eighty-one percent of the workforce are private workers. There are 4,780 commuting workers, with 76% driving alone

Quality of Life

11. On quality of life, Bollinger County ranks 86th out of 114 counties and 1 city. Rank 1 is best. The county receives a B- on individual indicators.
12. Bollinger County has 17% uninsured and is in the 4th Quartile.
13. Specific indicators in the county were worse than levels in similar demographics, the state and/or national levels. They were median household income, poverty level, banking services, households spending on home, number of children in preschool, number with an associate degree, violent crime, number of medical doctors, under age 65 without health insurance.
14. Bollinger County is at 738 per 100,000 population incarcerations in jail and prison. Additionally, 176 per 100,000 residents are incarcerated in jail.

Behavioral Risk Factors

15. Bollinger County is in Quartile 4 (Quartile 1 is best) for overall behavioral health. They have values of 39% for obesity, 36% for insufficient sleep, 28% for physical inactivity, 27% for adult smoking, 27% for impaired driving deaths, 25% for access to exercise opportunities, and 18% for excessive drinking.

Health Resource Availability

16. Clinical care considers number uninsured, primary care physicians, dentists, mental health providers, prevention hospital stays, mammography screening, and flu vaccinations. Bollinger County is in Quartile 3.
17. There is 1 primary care physician for a ratio of 12,130:1. Missouri's ratio is 1,400:1 with a range of 23,920:1 to 700:1.
18. The county is a Health Professional Shortage Area (HPSA) for primary care, behavioral health, and dental care. The rate of medical providers is in the 1st quartile (lowest rates). The red counties (1st quartile) have the least number of providers per 100,000.

19. According to the American Hospital Directory, there are no healthcare facilities in the county. The Bollinger County Public Health Center provides some healthcare services. There are no Federally Qualified Health Centers (FQHC) in Bollinger County.

Environmental Health Indicators

20. Bollinger County is in Quartile 3. Measured at the county level, Bollinger County does not have a presence of water violations.
21. Bollinger County's overall environmental score is 50 out of 100. Unfavorable scores include airborne risk of cancer and respiratory complications.
22. The county is in the 1st Quartile with 76% driving alone and in the 4th Quartile with 57% commuting a long distance.
23. The county's traffic volume is 14 per meter of major roadways in the county. State range is 0 to 1,238.
24. Air pollution in the United States is 7.5; Missouri is 8.2. The minimum for Missouri county is 6.1 and the highest is 10.7. Bollinger County has a particular matter of 8.8, which is in the 4th quartile
25. Environmental Regional Air Quality is measured as the number of days per year that are unhealthy for sensitive populations. Lower values are better. Bollinger County has 4.4 unhealth air quality days per year In 2015 it was 14.3 unhealthy air quality days per year.
26. Roadway pollution is defined as the percentage of the population living within 200 meters of a high-traffic road with more than 25,000 vehicles per day. Lower values are better. Industrial pollution is measured as the toxicity of airborne chemicals released from nearby industrial facilities. Values range from 0 to 9,070. Lower values are better. All metrics for the county are 0.
27. The county has a high Ultraviolet (UV) value of 10 (very high to extreme) in June and July and a low value of 2 (low risk) in January and December. Protection is needed starting at a value of 3 (Moderate to high), therefore, residents of the county need protection in 10 months of the year.
28. Census tract 9502 has one theme (house type/transportation) over 90% percentile. The data indicate that census tract 9503 has 2 flags assigned to a theme (persons with a disability and number of

mobile homes). Census tracts 9501 (persons with a disability) and 9502 (person with no high school diploma) have one flag across the four dimensions.

Social and Mental Health

29. Bollinger County is in the 1st quartile worst quartile) and has 11 active organizations in the county for a rate of 9.1 per 10,000 residents.
30. Bollinger County is in the 3rd quartile and 19% of individuals reported 14 or more days of poor mental health per month.
31. Bollinger County's values for death by suicide were suppressed for confidentiality, indicating they were less than 10 cases. Bollinger County values were suppressed (less than 10 counts) for alcohol-related disease death. The county is not represented in the deaths of despair for drug overdoses data because of suppression.
32. Bollinger County has a crime rate of 26 per 1,000 residents (with 309 offenses) and is in the 3rd quartile (next highest crime). The highest was aggravated assault (70) and aggravated assault and intimidation (63). Bollinger County's population was 10,567 in 2021.
33. Crimes against society were reported as 70 for the county in 2021. There were 26 drug/narcotic violations, 19 drug equipment violations and 17 weapon law violations. There were 46 vandalism offenses, 36 burglaries, 34 larceny offenses. Aggravated assault (61), intimidation (50), and simple assault (28) are noted values for 18 and over age cohort, but there are a lesser number of incidents for those under 18 years.
34. There were 53 court cases involving alcohol and drugs. Sixty percent were held in associate court, while 38% were held in circuit court. Thirty-two percent were related to alcohol; 66% were related to drugs.
35. Unlawful use of a weapon, possession of control substances, possession of marijuana, unlawful possession of drug paraphernalia, and DWI were the top offenses for the county. Those offenses totaled 50% of all 53 offenses.
36. Violent reported by the Bollinger Sheriff Department was low in the last decade and increased, then decreased. Property crime has seen a downward trend. For Marble Hill Police Department, violent crime has remained low, but property crime was higher in the early part of the last decade and is now seeing an increasing trend.

37. In 2021, an incident related to a sexual orientation bias was reported. There is a group in Marble Hill.
38. Rates worth noting in the county are Family -sodomy, aggravated assault, and intimidation and Bollinger Intimate - aggravated assault, simple assault, and intimate intimidation

Maternal and Child Health

39. The crude birth rate remained somewhat steady in the last decade from 12 per 1,000 residents to 13 per 1,000 residents. For 2020, there were 142 deliveries, 142 live births, and 0 fetal deaths. The highest counts of pregnancy and births are in the 25 to 29 age cohort.
40. Overweight and obesity are a concern for 31 and 40 out of 100 women, respectively. There were 15 per 100 women who had babies preterm (less than 37 weeks) and 8 per 100 babies who were small for gestational age. Thirty-six out of 100 women have less than 12 years of education at the time of their babies birth. Twenty-three out of 100 smoked at all during pregnancy and 6 out of 100 smoked 1 or more packs per day.
41. Missouri has a teen birth rate of 23 per 1,000, while Bollinger County has a rate of 29 per 1,000 which places it in Quartile 3.
42. Missouri has an infant mortality rate of 6 per 1,000 live births and a child mortality of 57 per 100,000. Bollinger County has no infant mortality or child mortality.
43. There are 2,642 children in households in the county. It is in the lowest Quartile 1 with 15% of children in single-parent households (N = 386). For comparison, Osage County, Missouri and St. Louis City, Missouri have just over 10% (minimum) and 48% (maximum) of children living in a single-parent household, respectively (2016-2020).
44. Each year, an estimated 4.2 million youth and young adults experience homelessness in the United States. In Missouri, there were 34,942 enrolled homeless students (2020-2021). There were 54 students who were homeless in different school districts, including 39 in Meadow Heights R-II, 4 in Woodland R-IV, 11 in Zalma R-V.
45. Third grade students are at grade level with reading and math scores. They are above the state percentage (50%) enrolled in free or reduced lunch (64%).
46. Missouri Student Survey noted higher values than 2022 Missouri Data and/or 2020 county data for use of electronic cigarettes, use of alcohol, Missed whole day(s) of school because you skipped or cut,

Made fun of other people, Were in a physical fight, Were very sad, Were grouchy or irritable, or in a bad mood, Felt like sleeping a lot more or a lot less than usual, Had difficulty concentrating on school work

47. Missouri student perceptions indicated high percentages for the perception of availability for “very” or “sort of easy” to get cigarettes, “very” or “sort of easy” to get e-cigarette, “very” or “sort of easy” to get alcohol, “Very” or “sort of easy” to get marijuana, “very” or “sort of easy” to get RX drugs that have not been prescribed to you.
48. Statements that described friends perception of coolness that were higher than state and/or previous county values were peers believe someone your age would be “pretty cool” or “very cool” if they used e-cigs, mods, or vape or peers believe someone your age would be “pretty cool” or “very cool” if they drank alcohol. The perception of harm for students was higher than state and/or county previous data for used e-cigarettes, smoke one or more packs of cigarettes /day, drink alcohol (no dosage specified), take one or two drinks of an alcoholic beverage nearly every day, have 5+ drinks, once or twice a week, smoke marijuana once or twice a week.

Death, Illness, and Injury

49. Bollinger is in the 4th quartile (lowest) for health factors and 3rd quartile for health outcomes.
50. Bollinger County had a natural decrease between -150 to -1 (births minus deaths).
51. The top causes of death by ICD Chapter in the county were diseases of the circulatory system, neoplasms (i.e., cancer), respiratory system (e.g., pneumonia, bronchitis, tuberculosis), genitourinary system (e.g., renal failure), nervous system (Alzheimer’s, Epilepsy, Parkinson’s), external causes (accidents, intentional self-harm), and codes for special purposes (COVID-19).
52. Providing further detail of deaths with ICD Sub-Chapters for Bollinger County, the highest number of deaths was caused by neoplasms (bronchus or lung), ischemia (atherosclerotic heart or cardiovascular disease), respiratory (COPD), and nervous system (Alzheimer disease).
53. For traffic accidents, speed for incorporated Bollinger County is a rank of 86 out of 107 ranks. Another analysis of traffic accidents from September 23, 2021 to September 22, indicated there were a

total of 53 traffic crashes in Bollinger County. Marble Hill and the Non-City or Unincorporated are the most geographically identifiable accidents. Several characteristics about traffic accidents in Bollinger County are as follows: Fixed objects and motor vehicle in transport are the most frequent type of accident with 49% and 30% of total accidents, respectively. Improper lane usage/change, none, too fast for conditions were responsible for circumstances the accidents with 28%, 17%, and 13% of the total accidents, respectively. No fatalities occurred and there were no apparent injuries for 32% of the accidents. Fifty-seven percent of the accidents had an evident injury that was not disabling. About 60% of the accidents occur during daylight hours.

54. CRD 708, West Main Street, CRD 620, 3rd Street, Industrial Park Drive, and Route WW were involved in more accidents (at this road). Missouri 51 and 34, Route H, Missouri 72, Central Avenue, Crown Street, Routes C and K were frequent locations of accidents (on this road).

Communicable Disease

55. Bollinger County has a chlamydia rate of 223 per 100,000, making it lower than the state value. Bollinger County has an HIV rate of 145 per 100,000 and in the 3rd quartile. Since January 22, 2020, there have been 2,529 cases of COVID-19 and 38 deaths.
56. The age cohort of more than 65 years are more vaccinated with at least one dose, fully vaccinated, and first booster.

Access

57. Bollinger County has a population of 10,567. Sixteen percent (N = 1,890) of Bollinger county residents are food insecure.
58. There are 18 active establishments in Bollinger County, Missouri (as of September 9, 2022).
59. The estimated population of children less than 5 years of age is 617. The percentage for the county is 19% of income needed for childcare with a range in Missouri of 11% to 33%. The county is in the 3rd quartile for the percentage of income required for childcare expenses (or known as the childcare cost burden). The higher the quartile and percentage the more income needed to pay for childcare.
60. Bollinger County has 74% with access to broadband, which places it in the 2nd quartile. The lower quartiles indicates less access.
61. The county receives an overall livability score of 34 for Marble Hill, 10 for Sedgewickville, and 11 for Zalma.

How to Read this Report

There are several features and characteristics of this report. Provided below is the feature and an explanation that may be helpful in understanding the results of this report.

Dimensions

Throughout the report, there are 11 dimensions that cover a range of issues necessary for good public health. At the beginning of each section (dimension), a paragraph is dedicated to providing background about how that dimensions fits into overall community health.

Data Visualization

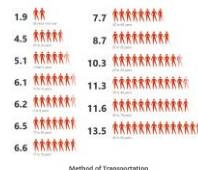
The data presented in this CHA are described through narrative and accompanied by an infographic, map, bar chart, table, or other type of image (Table 1). The purpose of the images is to illustrate the important information about the data in an easy to understand format.

Table 1. Data Visualization in this Report

Map



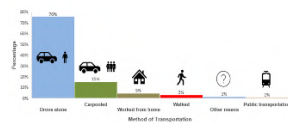
People Chart



Line graph



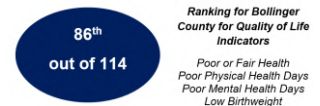
Infographic



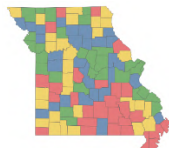
Table

War Era	Percentage Served
Vietnam Era 1964 to 1975	100%
Gulf War August 1990 to August 2001	25%
Gulf War September 2001 to 10/11	12%
Korean War 1950 to 1953	12%
World War II 1939 to 1945	0%

Single Number



Quartile Map



Rates

Most of the data presented in this report are in the form of rates. Rates are very important to understand the true comparison between one county to another county. All counties have different populations. All counties experience a disease or mortality to varying degrees. By using rates (e.g., crude death rates, age-adjusted rates), we take into consideration the population of the geographic area where the health problems occurred or the population the disease affected. For example, Jackson County, Missouri has a population of 700,733 people. Most of Kansas City, Missouri is within Jackson County. Bollinger County has a population of 10,567 people.

If we are tracking an outbreak of an infectious disease and learn that 500 cases were reported in Jackson County, Missouri and 500 cases were reported in Bollinger County, this would mean different things to the counties. To calculate a rate, use the following formulas. Both counties experience the same number of cases, but each has different populations. The disease is statistically more of a problem in Bollinger County per 10,000 people. The rate is higher in Bollinger County even though the number of cases for the two different counties is the same (Figure 2). Considering the population gives an understanding of the disease or public health problem.

$$\begin{array}{l} \text{Jackson County,} \\ \text{Missouri} \end{array} \quad \frac{500}{700,733} \quad \times \quad 10,000 \quad = \quad \begin{array}{l} \text{Rate of 7} \\ \text{per 10,000} \end{array}$$

$$\begin{array}{l} \text{Bollinger County,} \\ \text{Missouri} \end{array} \quad \frac{500}{10,567} \quad \times \quad 10,000 \quad = \quad \begin{array}{l} \text{Rate of 473} \\ \text{per 10,000} \end{array}$$

FIGURE 2

Evaluation Utilization

The purpose of a CHA is to generate findings about a community and areas of needed focus by the public health system. The CHA also documents what is going well in a community and its assets. A focus on evaluation use from the beginning provides a clear path for action through a review of the important findings and what strategies will be implemented. Table 4 provides a template for a listing of all findings and their priority or need for action.

Findings from the CHA are intensely reviewed, discussed, and prioritized. Strategies or evidence-based practices, through a Community Health Improvement Plan (CHIP), are considered, assigned responsibility, and the date of completion for the program or intervention is indicated.

Major Indicators of the Community Health Assessment (CHA)

Geographical and Demographic Characteristics

Geographic indicators include history, location in state and country, neighboring cities and towns, physical features, major highways and routes. Demographic characteristics include measures of total population as well as percent of total population by age group, gender, race and ethnicity, where these populations and subpopulations are located, and the rate of change in population density over time, due to births, deaths and migration patterns.

Historical and Geographical Context

Bollinger County is located in the Midwest of the United States (Figure 3) and as shown in Figure 4, in southeast Missouri (TUBS, 2011).

Bollinger county gets its name from George Frederick Bollinger who settled in the area in 1800 (Eaton, 1916). The United States took ownership from France in 1803, known as the Louisiana Purchase. Bollinger County was established March 1, 1851. The county has a total area of 621 square miles of which 3.3 square miles is water. The county borders other counties: Perry, Cape Girardeau, Stoddard, Wayne and Madison. The geography of Bollinger County ranges from flatlands in the south to hills in the north (U.S. Census Bureau, 2012).



FIGURE 3



FIGURE 4



FIGURE 5

Major Cities

The major cities within the County are Marble Hill. The county seat is Marble Hill. Villages include Glennallen, Sedgewickville, and Zalma. There are about 29 unincorporated communities (Figure 5).

Population

The total population in Bollinger County is 10,567 (U.S. Census Bureau, 2021a). The Rural-Urban Continuum Code is 3, which is a metro defined as counties of fewer than 250,000 population (U.S. Department of Agriculture, 2022a). Demographically, the gender ratio is 50% male and 50% female (U.S. Census Bureau, 2022c).

Population Trends

Figure 6 provides the population trends since 1860. Population growth has shifted over time with the highest population occurring in 1900. Population declined until 1970 and then steadily increased until 2010. The population of the county has been declining since 2010 (U.S. Census Bureau, 2022b).

Figure 7 provides population trends by city. Sedgewickville population has been increasing since 1970, while Marble Hill, Zalma and Glennallen populations declined in 2020.

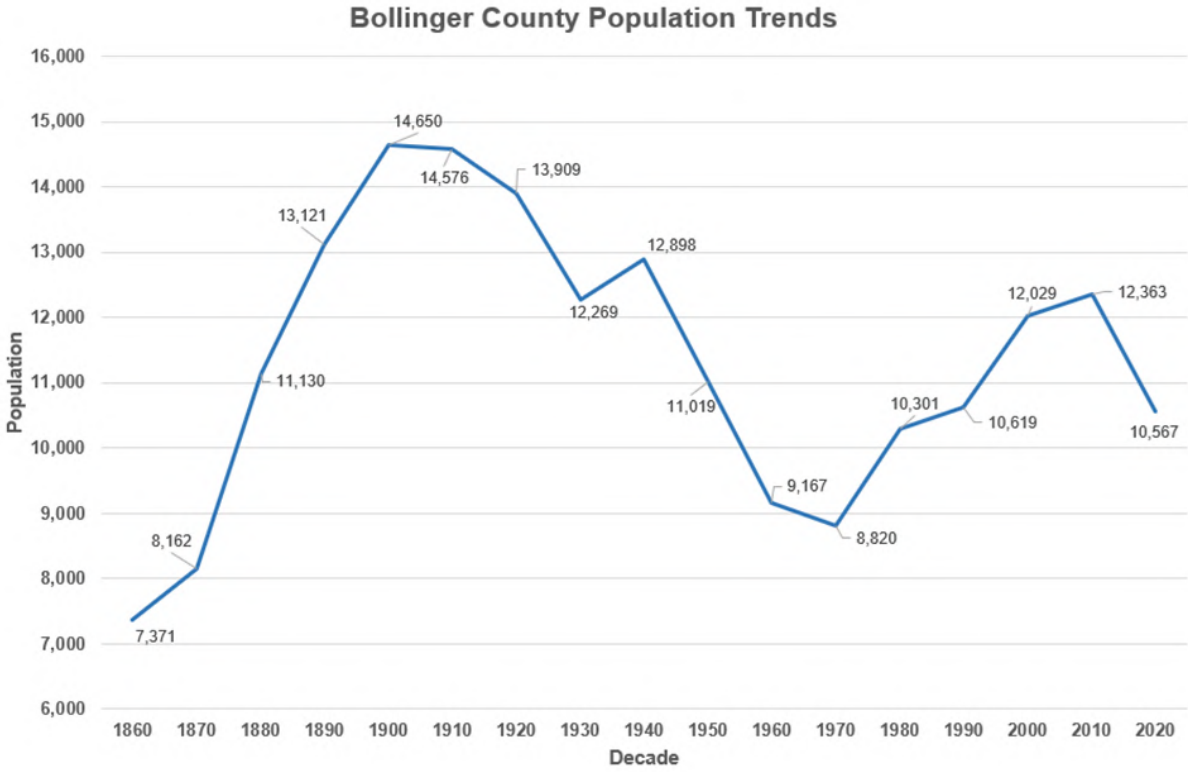


FIGURE 6

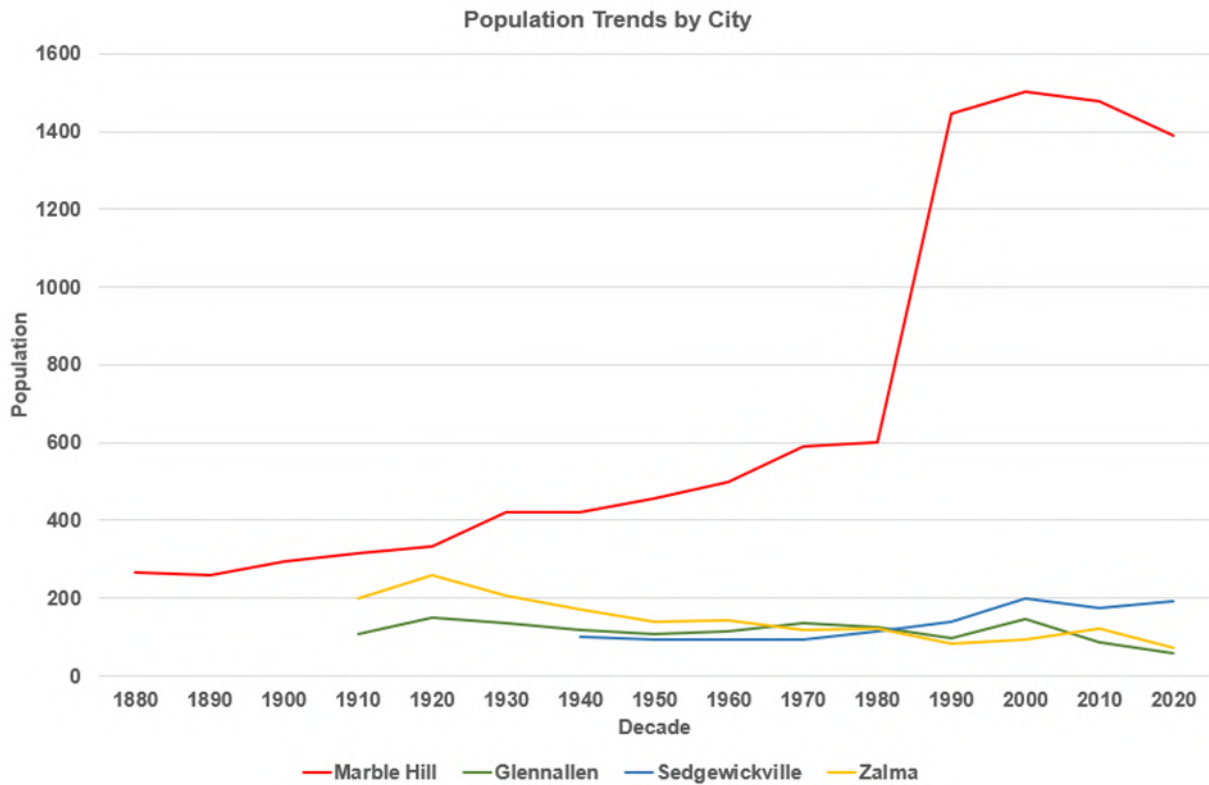


FIGURE 7

Figure 8 provides an illustration of rural and urban counties converted into quartiles. Quartile 1 is most populous, whereas Quartile 4 is more rural. Percent rural in the state ranges from 0% (St. Louis County) to 100% (Worth County). Bollinger County is a more rural county and is in Quartile 4.

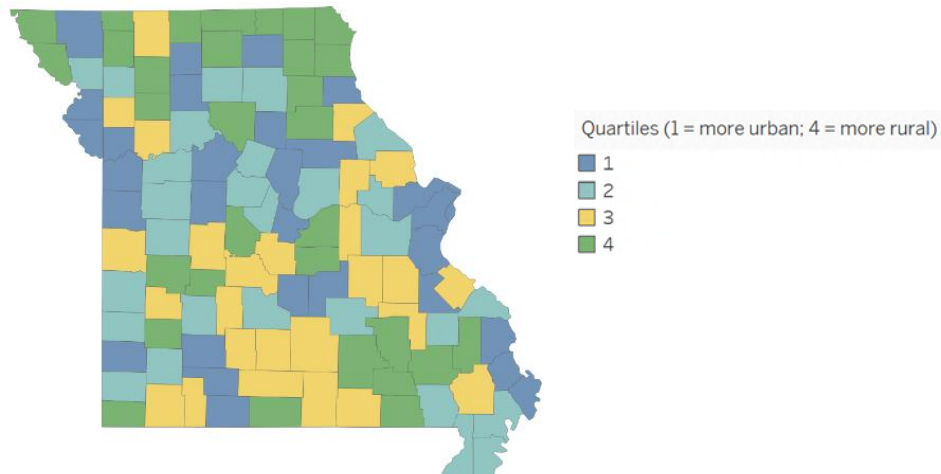


FIGURE 8

Race and Ethnicity

The people graph in Figure 9 shows that 85 years and over is the smallest cohort, 1.9%, and 45 to 54 years is the largest cohort, 13.5%. Figure 10 provides data on race and ethnicity. The population consists of those who identify as White (93%), Hispanic or Latino ethnicity (1.4%) followed by Black (0.3%) and Asian (0.2%) residents. Four percent of the county identifies as two or more races (U.S. Census Bureau, 2022c).

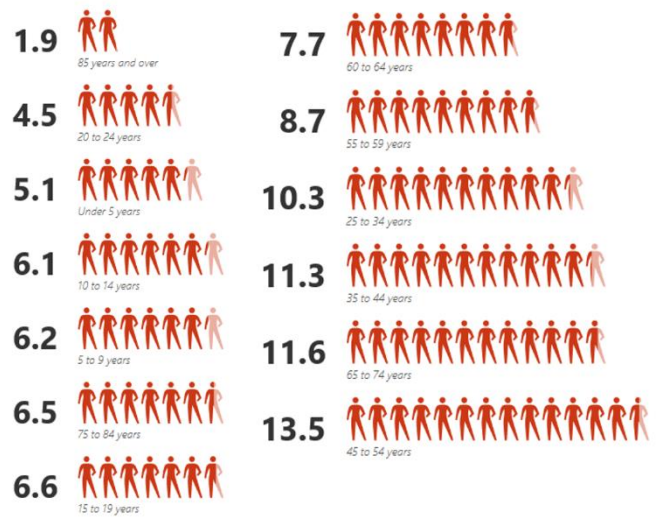


FIGURE 9

Race and Ethnicity

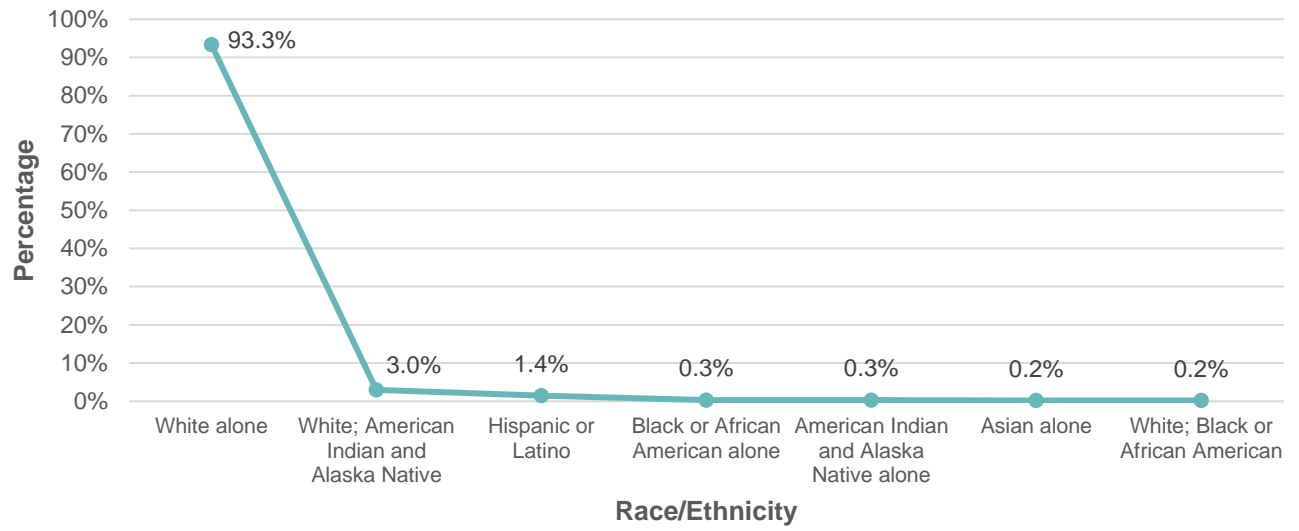


FIGURE 10

Socioeconomic Characteristics

Socioeconomic characteristics include measures that have been shown to affect health status, such as income, education, and employment, and the proportion of the population represented by various levels of these variables.

Figure 11 illustrates the quartiles of social and economic characteristics (1 = top ranks). Social and economic factors include education levels, employment and income, family and social support, and community safety. Bollinger County is in Quartile 3 (County Health Rankings, 2022a).

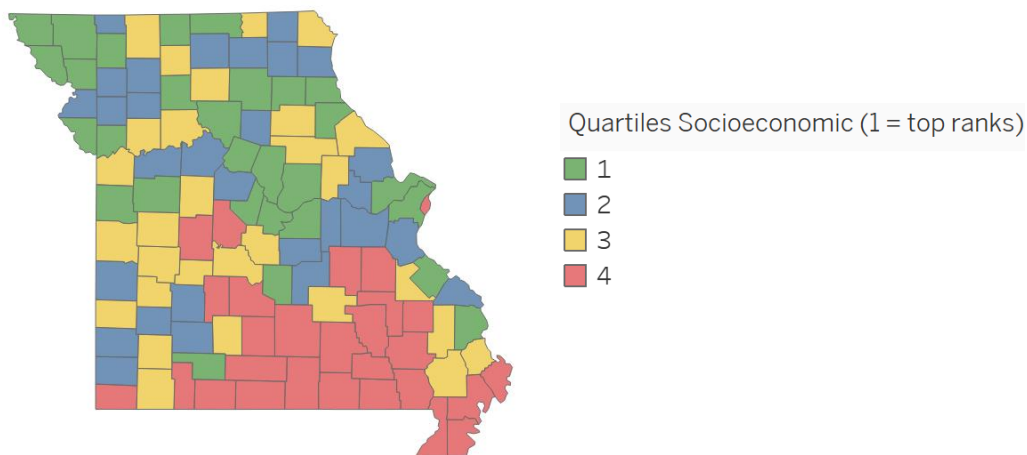


FIGURE 11

About 16% of residents are below the federal poverty level. For a family of four, the federal poverty level for 2022 is \$27,750 (U.S. Department of Health & Human Services, 2022). Table 2 describes poverty level by race/ethnicity. Individuals who report two or more races and Black or African American alone have the highest percent of being below the federal poverty level. There was no poverty level data for American Indian and Alaska Native alone or Hispanic or Latino origin (of any race).

Table 3 describes the age ranges and genders. The age cohort of 55 to 64 years has the highest percentage below federal poverty level at 51% (U.S. Census Bureau, 2022c).

Figure 12 provides the educational attainment for various age cohorts. Among those over 25 years, 46% have a high school graduate degree, while 21% have some college, but no degree. Around 88% of the total population, males, and females and any age

cohort are a high school graduate. In all age cohorts, females had more bachelor's degrees than males, except for females 65 and over.

Figure 13 illustrates the negative linear relationship between poverty and educational level. The lower the poverty status, the higher the educational attainment. Females have a higher percentage poverty than males for less than a high school degree. Although the poverty rate is lower for a bachelor's degree or higher, as education increases, males are at a higher poverty rate than females. In Figure 14, the median income is shown for those with varying levels of education. Again, as educational attainment increases, median income increases (U.S. Census Bureau, 2022e).

Table 2. Race/Ethnicity and Poverty Level

Race/Ethnicity	% Below the Federal Poverty Level	High Values
Two or more races	55.7%	✓
Black or African American alone	43.4%	✓
White alone, not Hispanic or Latino	15.3%	
White alone	15.2%	

Table 3. Age, Gender, and Percent Below Federal Poverty Level

Age and Sex	% Below the Federal Poverty Level	High Values
Age		
18 to 24 years	44.4%	
25 to 34 years	40.4%	
35 to 44 years	46.8%	✓
45 to 54 years	17.1%	
55 to 64 years	51.1%	✓
65 to 74 years	17.4%	
75 years and over	11.4%	
Gender		
Female	49.9%	
Male	50.1%	
<i>Federal Poverty Levels by Size of Family: 1 person \$13,590; 2 people \$18,310; 3 people \$23,030; 4 people \$27,750; 8 people \$46,630 (Office of the Assistant Secretary for Planning and Evaluation, 2022).</i>		

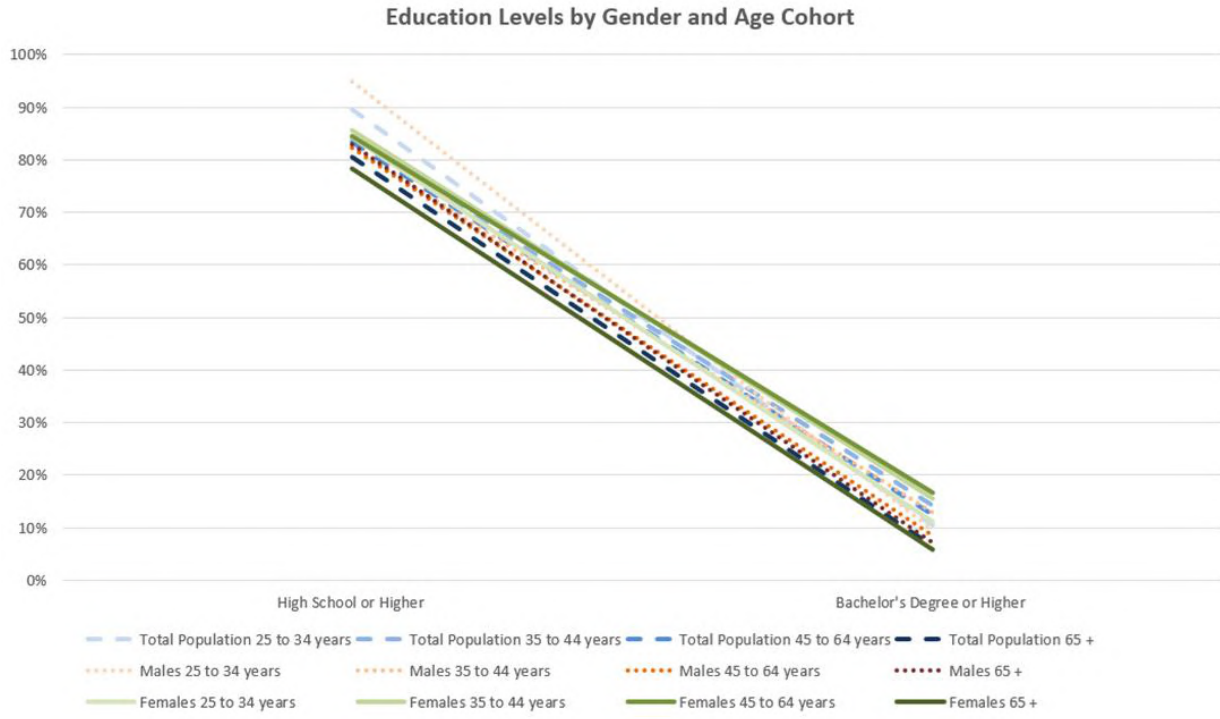


FIGURE 12

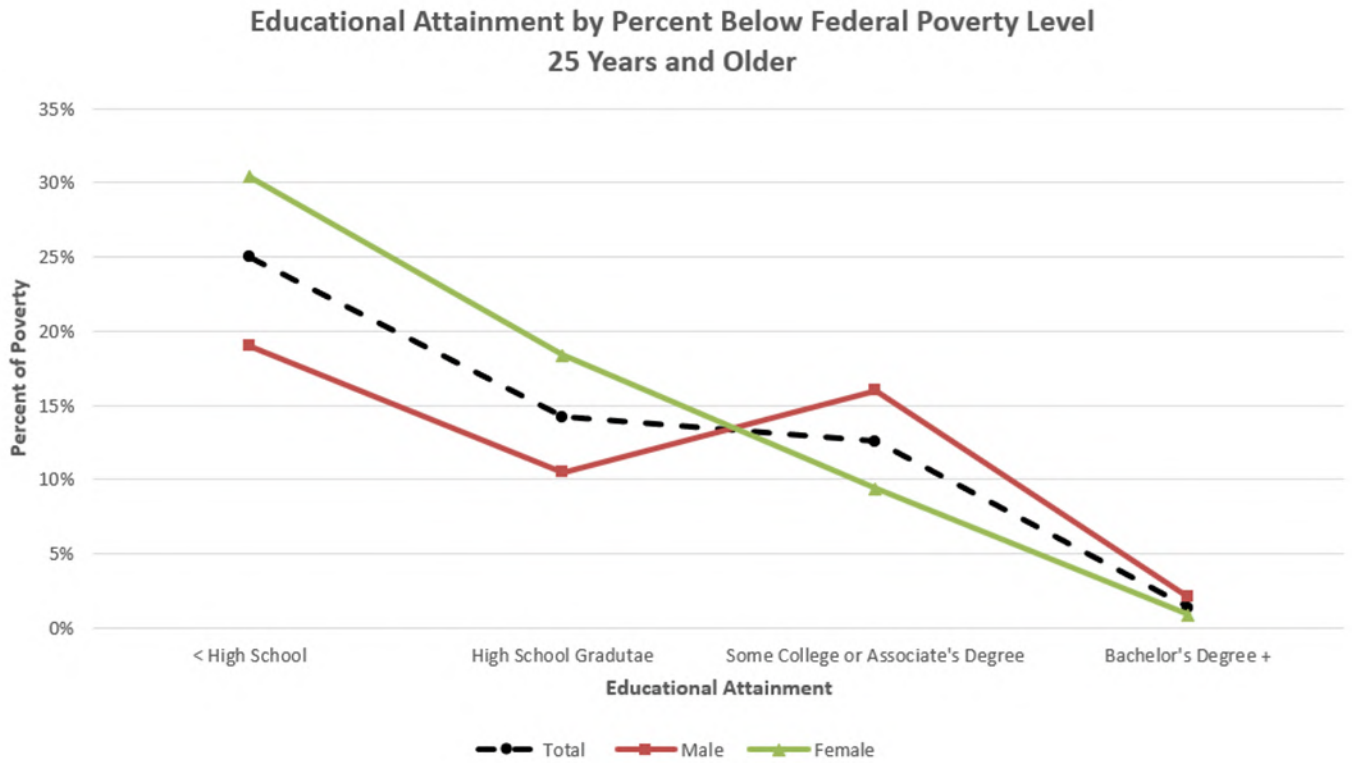


FIGURE 13

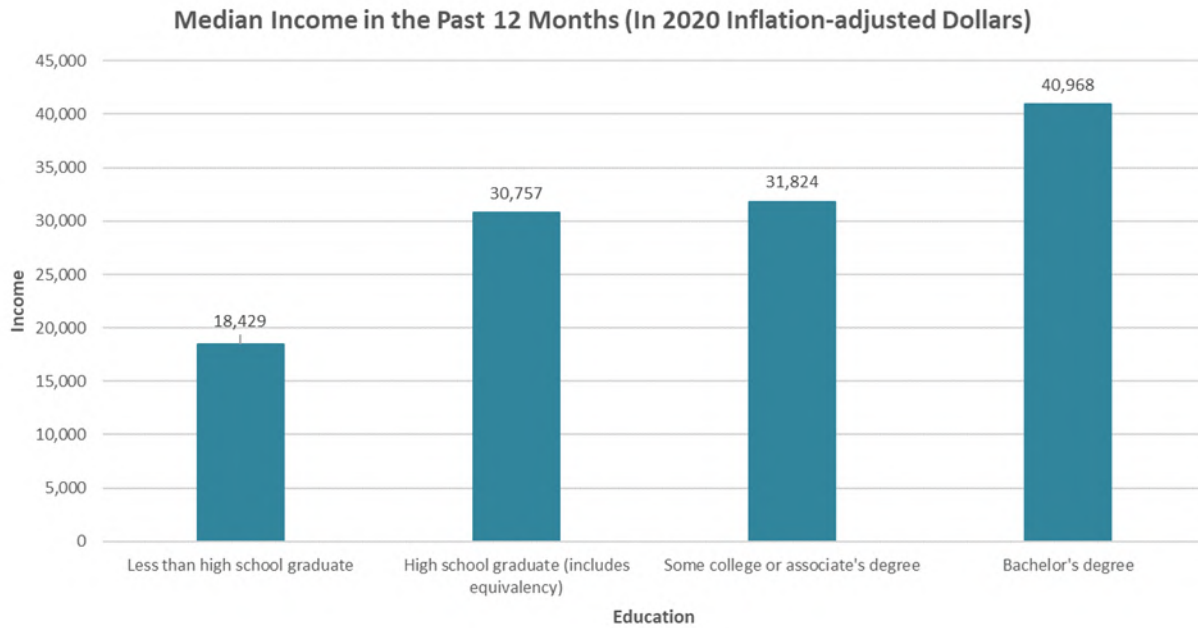


FIGURE 14

A description of the types of housing, age of housing, structure, and utility services is provided in Table 4.

Table 5 provides the housing livability from the American Association for Retired Persons (AARP). Cities are provided in the county. No policies existed at the state level for local inclusive design laws, local housing trust funds, manufactured housing protections, foreclosure prevention and protection, accessory dwelling unit support, and local plans to create age-friendly communities (American Association of Retired Persons, 2022).

Table 4. Housing and Family Characteristics

	Total	Married-couple family household	Male householder, no spouse present, family household	Female householder, no spouse present, family household	Nonfamily household
Total households	4,426	2,467	179	298	1,482
Average household size	2.7	3.34	4.89	4.03	1.12
Total families	2,944	2,467	179	298	-
Average family size	3.38	3.31	3.45	3.84	-

Housing Metric	Cities in Bollinger County, Missouri				
	Marble Hill	Glennallen	Sedgewickville	Zalma	U.S. Median
Zero-step entrances	50.1%	50.1%	50.1%	50.1%	50.1%
Availability of multi-family housing	22.7%	1.1%	2.3%	0%	18%
Housing costs (per month)	\$577	\$509	\$666	\$350	\$1,057
% Income spent on housing (burden)	10.3%	9.1%	11.9%	6.3%	16.3%
Subsidized units per 10,000 people	375	0	0	0	0

Severe Housing Problems

Housing is foundation to productive individuals, families, and societies. Housing can improve the economy. Housing is considered an upstream factor to many poor health and social outcomes. Further, the Office of Disease Prevention and Health Promotion (2022): stated that:

The quality of a home's neighborhood is shaped in part by how well individual homes are maintained, and widespread residential deterioration in a neighborhood can negatively affect mental health. Both home design and structure significantly influence housing quality and may affect mental and physical health. (para. 1)

Severe housing problems is defined as “the percentage of households with at least 1 of 4 housing problems: overcrowding, high housing costs, lack of kitchen facilities, and lack of plumbing facilities” (County Health Rankings, 2022, p. 8). The U.S. value is 17%; Missouri is 13% with a minimum of 5% and a high of 21%. Bollinger County has 13% severe housing problems and is in the third quartile (Figure 15).

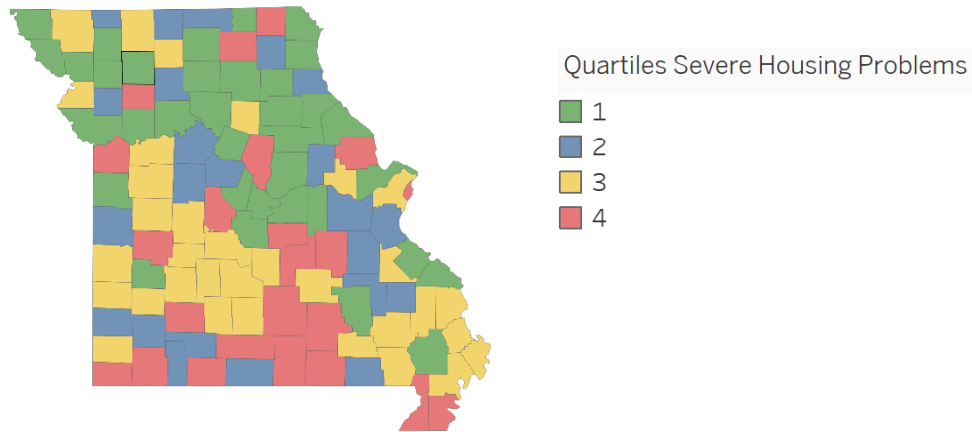


FIGURE 15

Employment

The employment status in Table 6 considers 16 years and over with a population of 9,931. Fifty-four percent are in the labor force. The unemployment rate for civilians is 6%. Half of female over the age of 16 are in the labor force. Figure 16 identifies the types of industry, with education and health care comprising 22% of the workforce (U.S. Census Bureau, 2022d).

Table 6. Employment Status	
Characteristic	Number/Percent
Population 16 years and over	9,931
In labor force	54%
Civilian labor force	5,326
Unemployment Rate	6%
Females 16 years and over	4,934
In labor force	50%

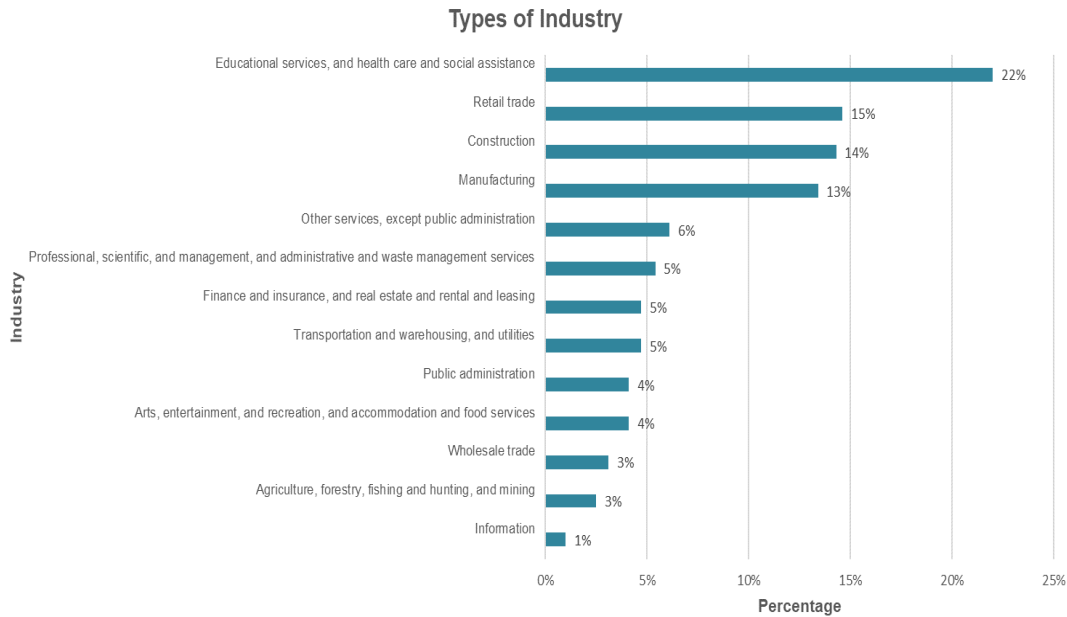


FIGURE 16

Details Of Industry: **Education** - Educational Services, and Health Care and Social Assistance; **Arts** - Arts, Entertainment, and Recreation, and Accommodation and Food Services; **Professional Services** - Professional, Scientific, and Management, and Administrative and Waste Management Services; **Other Services** - Other Services, Except Public Administration; **Finance** - Finance and Insurance, and Real Estate and Rental and Leasing; **Transportation** - Transportation and Warehousing, and Utilities; **Agriculture** - Agriculture, Forestry, Fishing and Hunting, and Mining

Veteran Characteristics

There are 911 veterans in the county (about 9.6%). More veterans are male (86%), White (93%), and at or above the FPL (93%). Under three fourths are without a disability (64%). As shown below, most veterans served in the Vietnam era. Age cohorts for veterans are 65 to 74 years (30%), 75 years or more (27%), and 35 to 54 years (25%). Most have a high school degree (58%), followed by some with a college or associate degree (28%), or a bachelor's degree or higher (8%). Table 7 provides the percentages by war era (U.S. Census Bureau, 2022d).

War Era	Percentage Served
Vietnam Era 1954 to 1975	50%
Gulf War August 1990 to August 2001	25%
Gulf War September 2001 or later	12%
Korean War 1950 to 1953	12%
World War II 1939 to 1945	0%

Income and Type of Worker, and Commuting

The highest income category for the county is \$50,000 to \$74,999, followed by \$75,000 to \$99,999 (Figure 17). Eighty-one percent of the workforce are private workers (Figure 18). There are 4,780 commuting workers, with 76% driving alone (U.S. Census Bureau, 2022e) in Figure 19.



FIGURE 17

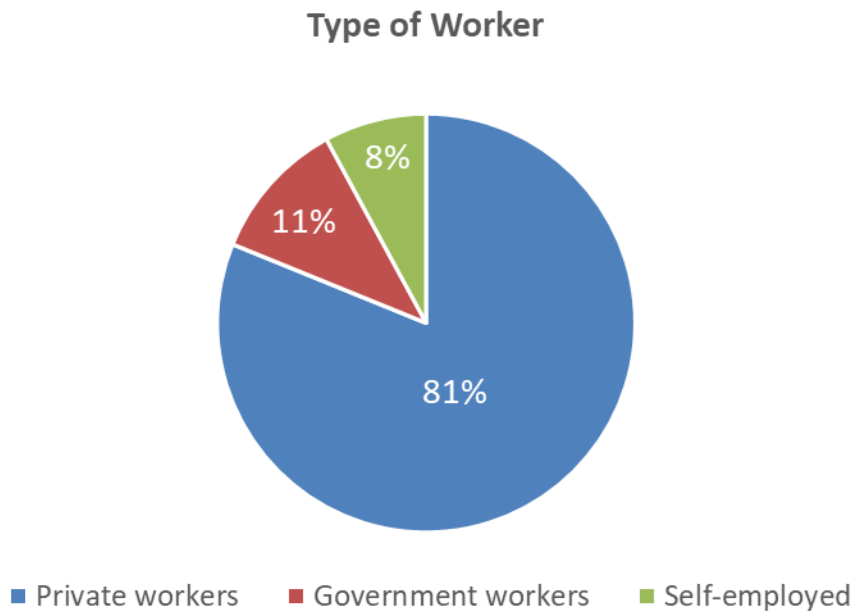


FIGURE 18

Method of Transportation



FIGURE 19

Health Resource Availability

This domain represents factors associated with health system capacity, which may include both the number of licensed and credentialed health personnel and the physical capacity of health facilities. In addition, the category of health resources includes measures of access, utilization, cost and quality of health care and prevention services. Service delivery patterns and roles of public and private sectors as payers and/or providers may also be relevant. This section will focus on primary physicians and specialist, hospitals, clinics, mental health treatment facilities, and dental care.

As of May 2022, in the United States, there were 496,923 primary care physicians and 576,693 specialist physicians. In Missouri, there are 9,944 primary care physicians and 11,966 specialists (Kaiser Family Foundation, 2022). Primary Care Physicians include Internal Medicine, Family Medicine/General Practice, Pediatrics, Obstetrics & Gynecology, Geriatrics. Specialist physicians include Psychiatry, Surgery, Anesthesiology, Emergency Medicine, Radiology, Cardiology, Oncology (Cancer), Endocrinology, Diabetes, and Metabolism and all other specialties (Rural Health Information Hub, 2022).

Overall, clinical care is measured by access to care and quality of care. In Figure 20 below, clinical care rankings are converted into quartiles (1 = better access and quality scores). Clinical care considers number uninsured, primary care physicians, dentists, mental health providers, prevention hospital stays, mammography screening, and flu vaccinations. Bollinger County is in Quartile 3.

For Bollinger County, there is 1 primary care physician for a ratio of 12,130:1. Missouri's ratio is 1,400:1 with a range of 23,920:1 to 700:1 (County Health Rankings, 2022a).

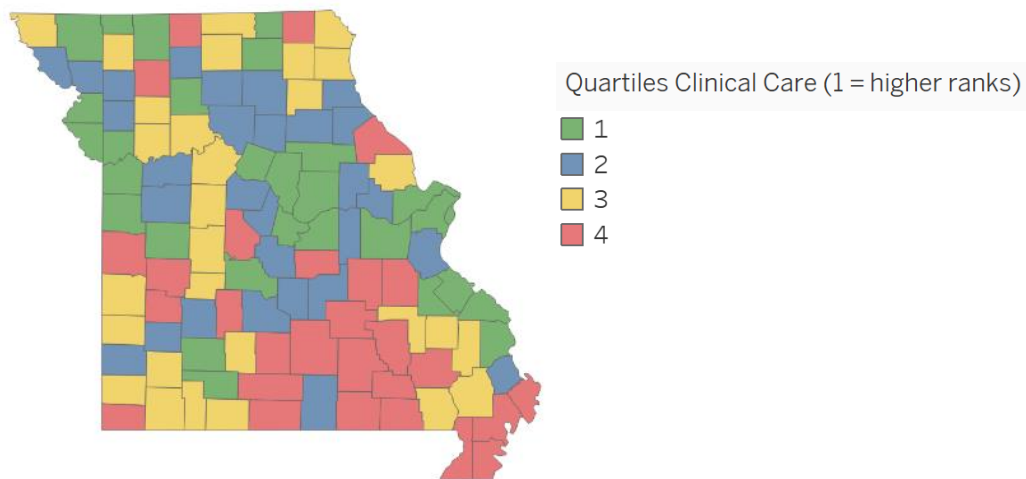


FIGURE 20

Shortage of Medical Personnel

Figure 21 provides maps with the rate of physicians, dentists, and mental health professionals per 100,000 across the state. Bollinger County's rate of medical providers is in the 1st quartile (lowest rates). The red counties (1st quartile) have the least number of providers per 100,000 (County Health Rankings, 2022a). According to the Rural Health Information Hub (2022) the county is a Health Professional Shortage Area (HPSA) for primary care, behavioral health, and dental care (Figure 22). Approximately 93% of Missouri counties are considered full shortage areas for primary care. For mental health, the county is one of the 98% of counties in Missouri that are HPSAs. Bollinger County is one of the 91% of counties where the whole county is a HPSA for dental care.

Table 8 outlines the type of medical care provider for the county by 10,000 population. It also gives the state range (Rural Health Information Hub, 2022). Calculations, called the Cooper Demand-Based Model, have been performed that estimate the ideal number of physicians necessary for a population of 100,000. For family medicine the suggested ratio is just above 30 and for general surgery the ratio is 7.9 (Merritt Hawkins Team, 2018).

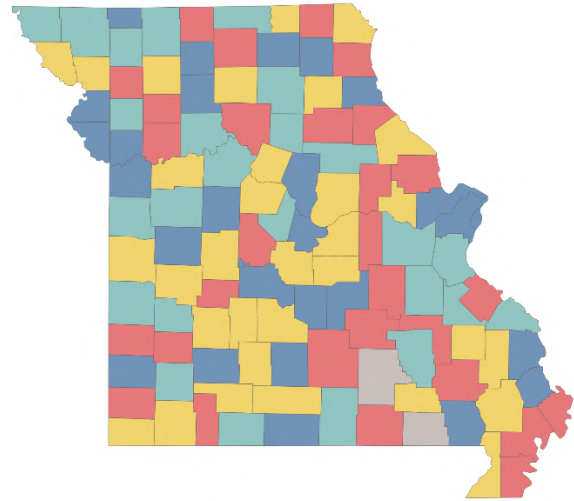
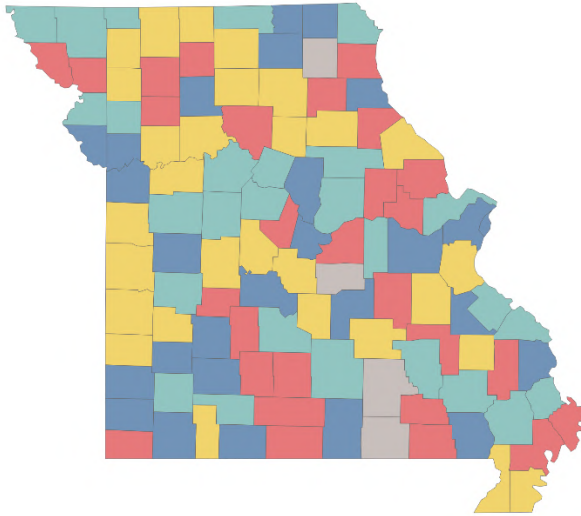
Table 9 provides opportunities for access to hospital care by type and location (American Hospital Directory, 2022). According to the American Hospital Directory, there are no healthcare facilities in the county. There is one Federally Qualified Health Centers (FQHC) in Bollinger County.

Type of Provider	Number per 10,000 population	State Range
Total Physicians	1	122 to 1
Primary Care Physicians	1	14 to 0
Doctor of Medicine	1	118 to 0
Doctors of Osteopathy	0	63 to 0
Physician Assistant	0	45 to 0
Nurse Anesthetists	0	8 to 0
Nurse Practitioners	1	37 to 0
Dentists	3	6 to 0

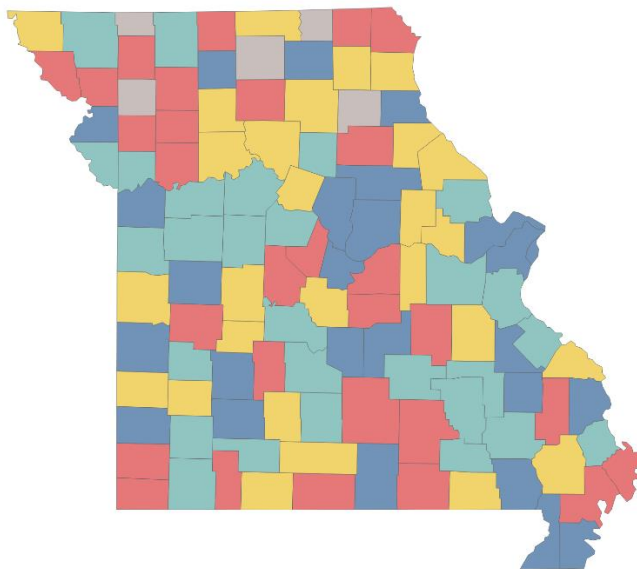
Bollinger County Rates of Providers

Physician Ratio 12,130:1

Dentist Ratio 4,040:1



Mental Health Professionals Ratio 6,060:1



Quartiles

- 1
- 2
- 3
- 4
- 5

FIGURE 21

Health Professional Shortage Areas for Primary Care, Mental Health and Dental Care

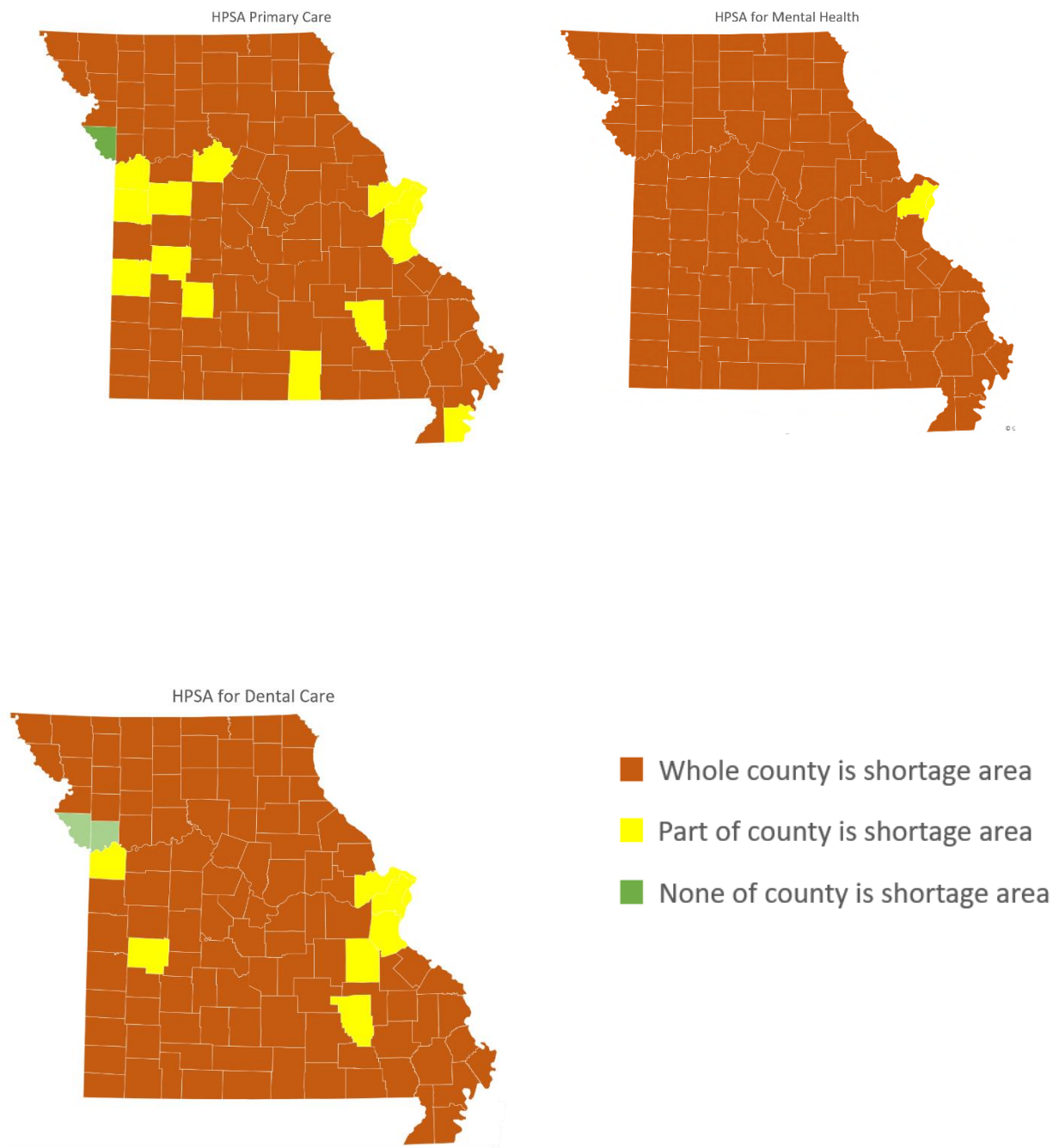


FIGURE 22

Name	Type	City
1. Saint Louis Children's Hospital	Children's	Saint Louis
2. Shriners Children's St. Louis	Children's	Saint Louis
3. SSM Health Cardinal Glennon Children's Hospital	Children's	Saint Louis
4. Kindred Hospital Saint Louis	Long Term	Saint Louis
5. Kindred Hospital Saint Louis South	Long Term	Saint Louis
6. Landmark Hospital of Cape Girardeau	Long Term	Cape Girardeau
7. Peace Haven Association	Other	Saint Louis
8. Barnes-Jewish Hospital Psychiatric Support Center	Psychiatric	Saint Louis
9. Cottonwood Residential Treatment Center	Psychiatric	Cape Girardeau
10. Hawthorn Children's Psychiatric Hospital	Psychiatric	Saint Louis
11. Metropolitan Saint Louis Psychiatric Center	Psychiatric	Saint Louis
12. Saint Louis Psychiatric Rehabilitation Center	Psychiatric	Saint Louis
13. Southeast Behavioral Hospital	Psychiatric	Cape Girardeau
14. The Rehabilitation Institute of Saint Louis	Rehabilitation	Saint Louis
15. Barnes-Jewish Hospital	Short-term Acute Care	Saint Louis
16. Christian Hospital	Short-term Acute Care	Saint Louis
17. Mercy Children's Hospital Saint Louis	Short-term Acute Care	Saint Louis
18. Mercy Heart and Vascular Hospital Saint Louis	Short-term Acute Care	Saint Louis
19. Mercy Hospital Jefferson	Short-term Acute Care	Festus
20. Mercy Hospital Saint Louis	Short-term Acute Care	Saint Louis
21. Mercy Hospital South	Short-term Acute Care	Saint Louis
22. Missouri Baptist Medical Center	Short-term Acute Care	Saint Louis
23. Missouri Delta Medical Center	Short-term Acute Care	Sikeston
24. Saint Francis Medical Center	Short-term Acute Care	Cape Girardeau
25. Saint Luke's Des Peres Hospital	Short-term Acute Care	Saint Louis
26. South City Hospital	Short-term Acute Care	Saint Louis
27. Southeast Hospital	Short-term Acute Care	Cape Girardeau
28. SSM Health Saint Louis University Hospital	Short-term Acute Care	Saint Louis
29. SSM Health Saint Mary's Hospital - Saint Louis	Short-term Acute Care	Saint Louis
30. VA St. Louis Health Care System John Cochran Division	Short-term Acute Care	Saint Louis

Health Insurance

Health insurance is a gatekeeper for optimum health. Medical care is expensive and can be unexpected. Health insurance can cover procedures at a reduced cost. Health insurance helps cover outpatient care, emergency services, hospital stays, baby care, mental health and substance misuse, prescriptions, disability care, lab tests, preventive services, and dental and vision. Having health insurance promotes a relationship with primary care so health issues can be prevented or examined before they become more serious. The United States has 11% of the population uninsured, whereas Missouri has 12% uninsured. The Missouri county minimum is 7%, while the maximum uninsured is 23%. Bollinger County has 17% uninsured and is in the 4th Quartile (County Health Rankings, 2022a) as shown in Figure 23.

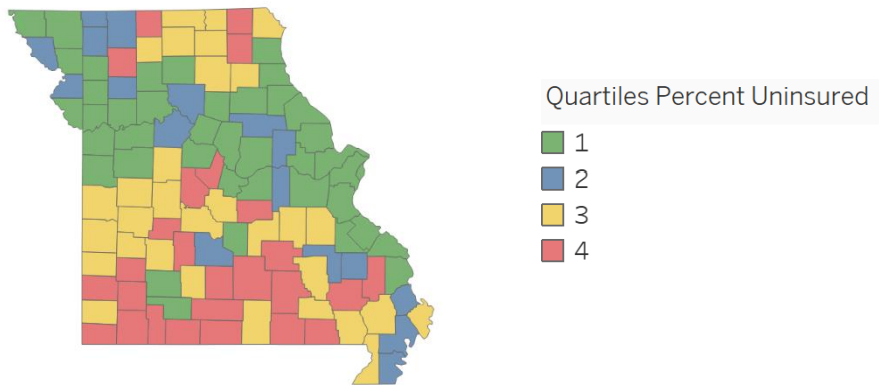


FIGURE 23

Quality of Life (QOL)

The World Health Organization (WHO) defines Quality of Life (QOL) as an

individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept incorporating in a complex way the persons' physical health, psychological state, level of independence, social relationships, personal beliefs and their relationships to salient features of the environment. broad multidimensional concept that usually includes subjective evaluations of both positive and negative aspects of life. (World Health Organization, 2012, p. 14)

The County Health Rankings (2022a) defines QOL as “how healthy people feel while alive...the well-being of a community, and underscores the importance of physical, mental, social, and emotional health from birth to adulthood” (para. 1). Four measures are used to rank each county. Bollinger County ranks 86th out of 114 counties and 1 city (Figure 4). Rank 1 is best. A complete picture of QOL includes more indicators as shown in Table 10 (County Health Rankings, 2022a).

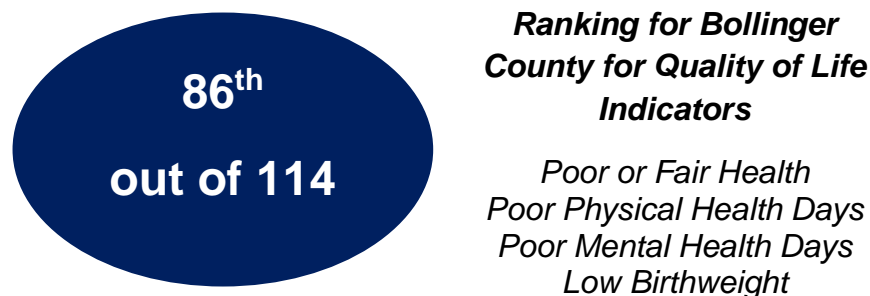


FIGURE 24

Table 10. Quality of Life Indicators for Bollinger County, Missouri (2018-2020)			
Indicator	Definition	Bollinger County	Missouri
1. Poor or Fair Health	Percentage of adults reporting fair or poor health (age-adjusted).	24%	18%
2. Poor Physical Health Days	Average number of physically unhealthy days reported in past 30 days (age-adjusted).	5.1	4
3. Poor Mental Health Days	Average number of mentally unhealthy days reported in past 30 days (age-adjusted).	5.5	4.9
4. Low Birthweight	Percentage of live births with low birthweight (< 2,500 grams).	7%	9%
5. Frequent Physical Distress	Percentage of adults reporting 14 or more days of poor physical health per month (age-adjusted).	17%	12%
6. Frequent Mental Distress	Percentage of adults reporting 14 or more days of poor mental health per month (age-adjusted).	19%	16%
7. Diabetes Prevalence	Percentage of adults aged 20 and above with diagnosed diabetes (age-adjusted).	11%	9%
8. HIV Prevalence	Number of people aged 13 years and older living with a diagnosis of human immunodeficiency virus (HIV) infection per 100,000 population	145	248
<i>Note: Only first four indicators are included in ranking. Indicators 1-7 are data from Behavioral Risk Factor Surveillance System; Indicator 8 is from National Center for HIV/AIDS.</i>			

Opportunity

The Opportunity Index was developed by the Opportunity Nation (2022). The founders of this Index state:

Many factors influence the kinds of opportunity people have, starting with unchangeable characteristics such as gender, race and ethnicity, genetic factors and family background. The quality of parenting, a family’s income and individual health as well as the health and safety of neighborhoods, the quality of schools and the inclusiveness of one’s community—all of these can respond to improvement efforts at personal, institutional and societal levels. These conditions vary from place to place, as well as over time, and that is why these conditions are the focus of the Opportunity Index.

The Index is multidimensional in nature and describes more than only the economic opportunities in a community. Many of these individual indicators are presented in other areas of this assessment. This combination of factors provides an indication of all the factors that define opportunity in a community. This can influence the potential for quality of life.

Missouri’s Index Score is 52.6 out of 100 with a rank of 28th out of 51 states and the District of Columbia (Table 11). The highest rank is Minnesota with an overall Opportunity Score of 63.1 and the lowest rank is New Mexico with an overall Opportunity Score of 42.4. The 2019 Index includes indicators within four dimensions of community well-being:



Table 12 provides more detail for the 16 indicators that form the Index. The county receives a B- on individual indicators.

Table 11. State Rank and County, State and National Dimension Scores for Opportunity Index (2019)


<i>State Rank</i> 28					
Geography	Opportunity Score	Economy Score	Education Score	Community Score	Health Score
Bollinger County	0	51.4	46.9	34.2	0
Missouri	52.6	59.3	56.6	47.8	46.6
United States	53.2	57.0	56.1	47.8	52.0

Table 12. Detailed Opportunity Index Data for by County, Similar Demographics, Missouri and National

Variable	Bollinger County	Counties With Similar Demographics	Missouri	National
Unemployment Rate (%)	3.3%	3.30%	3.00%	3.30%
Median Household Income (\$)	\$36	\$47,053	\$47	\$53
Poverty (% below poverty line)	19.9%	14.50%	13.40%	13.40%
80/20 Ratio (household income at the 80th percentile to that of the 20th percentile)	4.5	4.5	4.5	4.9
Banking Services (per 10,000)	3.3	4.4	4.5	3.7
Households Spending < than 30% of Household Income on Housing Costs (%)	79.1%	73.50%	74.00%	68.30%
Percent Broadband Internet Subscription	-	83.80%	81.60%	83.80%
Education				
Preschool (% ages 3 and 4 in school)	30.5%	43.10%	46.10%	48.00%
% On-Time High School Graduation (4 years)	95.8%	90.10%	88.50%	84.80%
Associate Degree or Higher (% of adults 25 and older)	14.8%	34.10%	36.90%	40.50%
Community				
Youth Not in School and Not Working (% ages 16-24)	15.4%	12.50%	10.90%	11.50%
Volunteering (% of adults ages 18 and older)	-	-	27.70%	27.50%
Voter Registration (% of population 18 and older registered to vote)	-	-	71.30%	62.70%
Violent Crime (per 100,000 population)	437.7	228.2	530.3	382.9
Medical Doctors (per 100,000 population)	8.1	69.7	70	75.5
Grocery Stores and Produce Vendors (per 10,000 population)	-	1.6	1.7	2.1
Health				
Low Birth Weight (% of infants born weighing less than 5.5 lbs.)	-	7.60%	8.70%	8.30%
% under age 65 without health insurance)	10.4%	8.30%	9.10%	8.70%
Deaths Related to Alcohol / Drug Abuse or Suicide (per 100,000 population)	-	38.6	40.6	34.9

Incarceration

According to Vera Institute of Justice (2022), 1.8 million people were incarcerated in the United States in the Spring of 2021. More than 11 million people are sent to jails and prisons each year. In Bollinger County, the following statistics apply for 2020 (rate per 100,000 residents 15 to 64 years):

- **240** people were in jail pretrial
- **4,912** people were admitted to jail
- **176** people were jailed
- **563** were sent to prison
- **738** total people in jail and prison

Below is shown the state and the combination of jail (Figure 26) and jail and prison incarceration (Figure 25) at a rate of 100,000 residents for ages 15 to 64 years. For jail incarceration, Bollinger County is at 176 per 100,000 population (red shading). Additionally, 738 per 100,000 residents are incarcerated in jail and prisons (lighter purple).

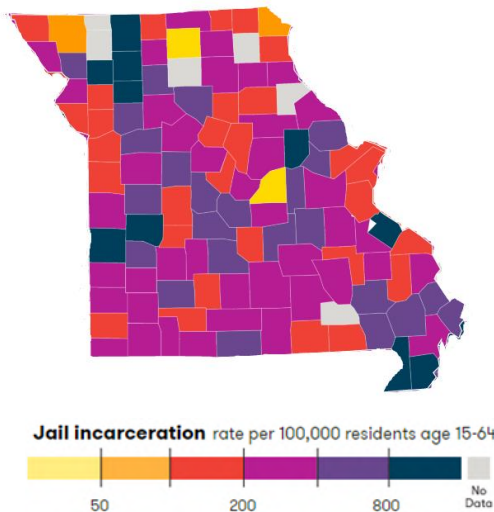


FIGURE 25

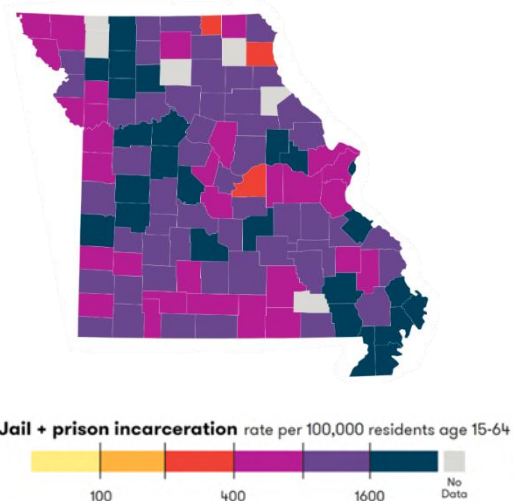


FIGURE 26

Behavioral Risk Factors

The American Psychological Association (2022) defines behavioral risk factors as “any specific behavior or pattern of behaviors (e.g., overeating or smoking) that increases an individual’s likelihood of developing a disorder, disease, or syndrome” (para. 1).

Overall, in Figure 27, behavior is illustrated through quartiles (1 = top quartiles). Health behaviors includes tobacco use, obesity, food access, inactivity, exercise opportunities, drinking, alcohol-impaired driving deaths, sexually transmitted infections, and teen births. Bollinger County is in Quartile 4.

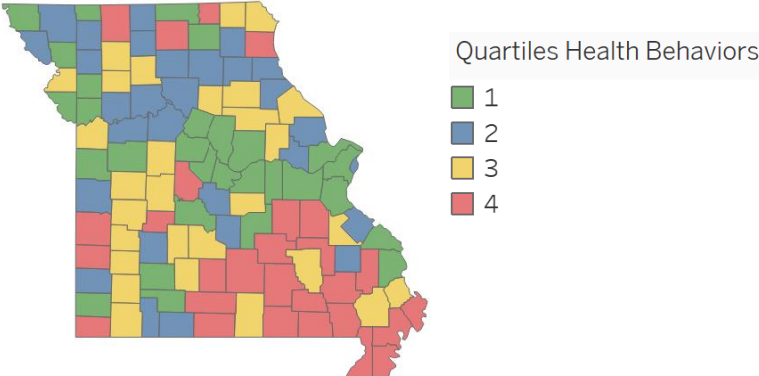


FIGURE 27

Risk factors in this category include behaviors which are believed to cause, or to be contributing factors to, injuries, disease, and death during youth and adolescence and significant morbidity and mortality in later life. Behaviors included for this report are tobacco use, diet and exercise, alcohol and drug use, and sleep. These main variables are further defined in Figure 28. Research shows these behaviors lead to symptoms and then poor health outcomes, such as disease and death. For Bollinger County, as shown in Figure 28, all values are aligned with the state values (County Health Rankings, 2022a; Centers for Disease Control and Prevention, 2022a). Figure 29 shows the values for the more defined variables.

Behavioral Risk Factors and Definitions

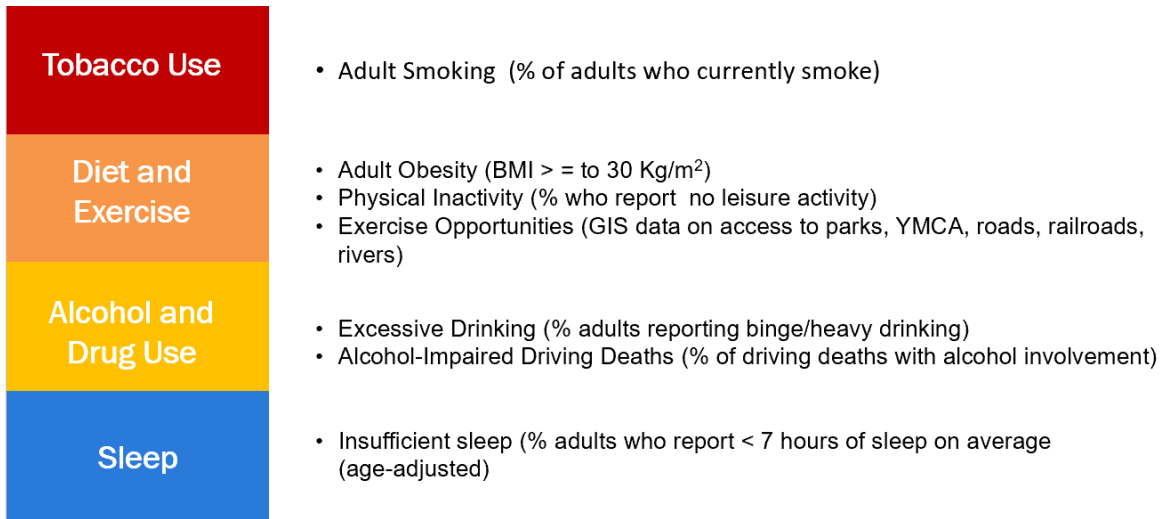


FIGURE 28

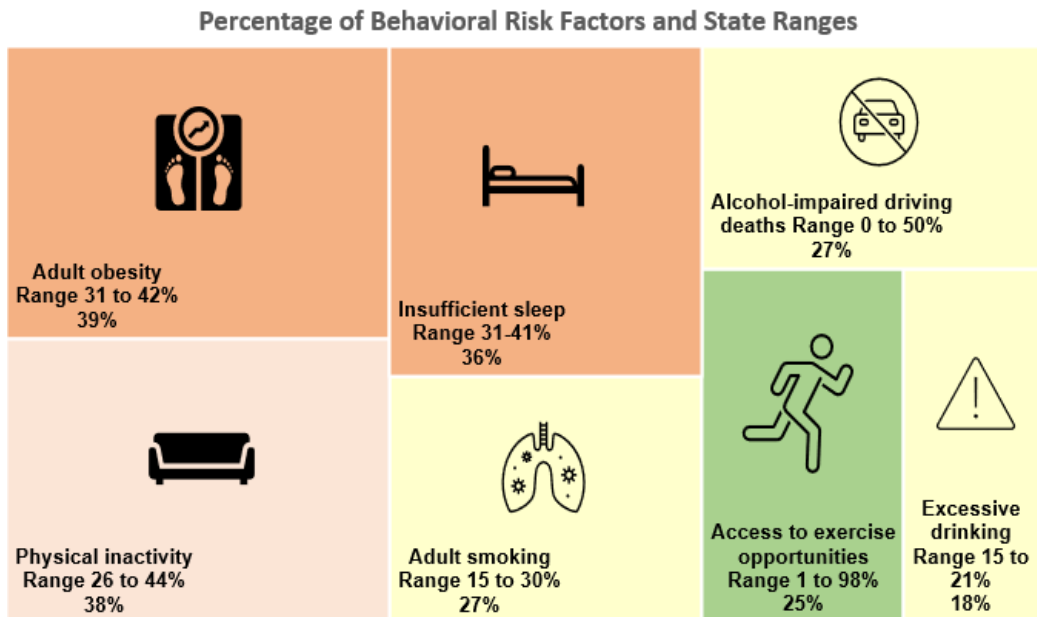


FIGURE 29

Environmental Health Indicators

The physical environment directly impacts health and quality of life. Clean air and water, as well as safely prepared food, are essential to physical health. Exposure to environmental substances such as lead or hazardous waste increases risk for preventable disease. Unintentional home, workplace, or recreational injuries affect all age groups and may result in premature disability or mortality.

Overall Physical Environment

Figure 30 illustrates the physical environment quartiles. Overall physical environment includes air pollution (particulate matter), drinking water violations, severe housing problems, driving alone to work, and long commute (driving alone). Bollinger County is in Quartile 3 (County Health Rankings, 2022a).

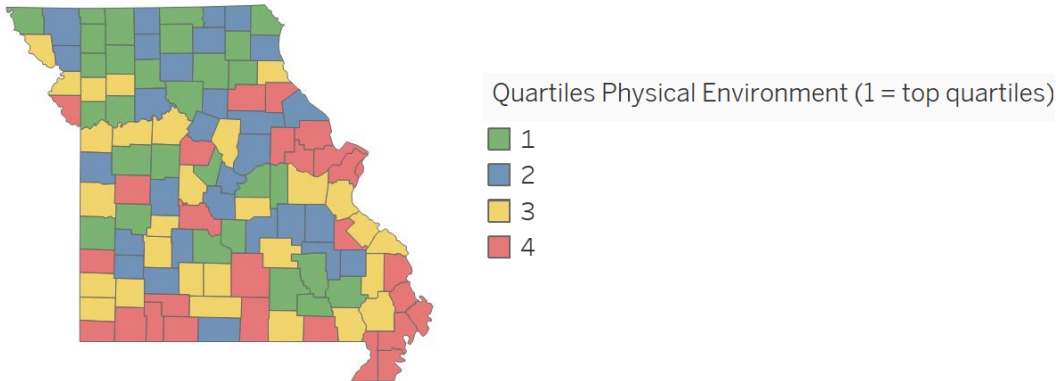


FIGURE 30

The U.S. News and World Report (2022) in partnership with the University of Missouri Extension Center for Applied Research and Engagement Systems (CARES) is another source for overall environmental climate. They state that the environment category “assesses the health of a community's natural surroundings by including measures of air and water quality, access to parks and natural amenities, and environmental risks” (para. 7). Bollinger County’s overall environmental score is 50 out of 100. Table 13 provides individual metrics for the environmental score. Unfavorable scores include airborne risk of cancer and respiratory complications.

Metric	Definition	Bollinger County	United States	Peer Group¹	Missouri
Airborne Cancer Risk (%)	Probability of contracting cancer over the course of a lifetime based on air toxics health risks; per 1M population	32	26	27	32
Air Quality Hazard	Potential risk of developing serious respiratory complications over the course of a lifetime; smaller values indicate reduced risk	.38	.34	.36	.42
Drinking Water Violation Rate	Violation points, according to EPA standards, per 1,000 population	.08	.03	.01	.02
Toxic Release Index Score	Relative health risk from exposure to toxic chemicals	--	.04	.08	.75
Trees	Area with a tree canopy	39	21	19	19
Natural Amenities Index Score	Higher score indicates a community has milder summers and winters, as well as more sunshine and topographic diversity; index range is approximately -2 to 11	.49	.22	.24	.04
FEMA National Risk Index Score	Higher score on scale of zero to 100 indicates more risk from natural hazards relative to other communities	9	9	10	18
Homes in Flood Hazard Zone	Number of homes	10	4	3	4

Water

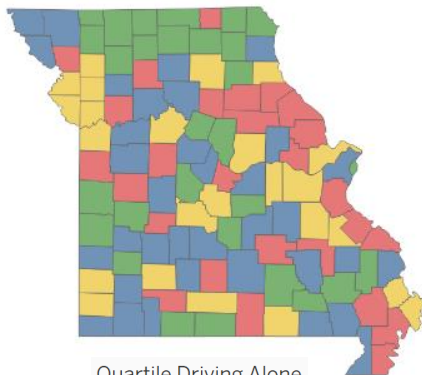
Drinking water quality is defined as the percentage of the population getting water from public water systems with at least one health-based violation during the past year. Lower values are better. Measured at the county level, Bollinger County does not have a presence of water violations (County Health Rankings, 2022a, U.S. Environmental Protection Agency, 2022a).

Driving Alone and Long Commute

This variable is the percentage of the workforce that drives alone to work and the percentage who drives more than 30 minutes to work. In the United States, 75% of the workforce drives alone and 37% drive more than 30 minutes to work. In Missouri, 81%

¹ Peer groups are based on urban rural status and economic performance to allow for comparisons among similar communities.

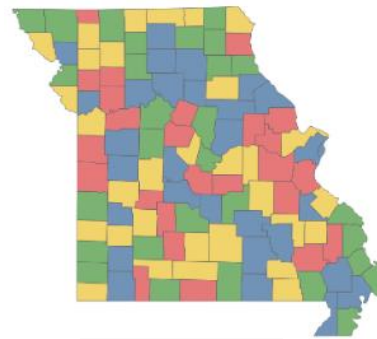
drive alone and 32% drive more than 30 minutes. The Missouri minimum is 61% for those driving alone and 14% for those driving more than 30 minutes. The maximum in the state is 88% for those driving alone and 57% for those driving more than 30 minutes. The figures below indicate that Bollinger County is in the 1st Quartile with 76% driving alone (Figure 31) and in the 4th Quartile with 57% (Figure 32) commuting a long distance (County Health Rankings, 2022a).



Quartile Driving Alone

- 1
- 2
- 3
- 4

FIGURE 31



Quartile Commute

- 1
- 2
- 3
- 4

FIGURE 32

Traffic Volume

Traffic volume provides an indication of proximity to vehicles. This is related to noise pollution, toxic gases, particulate matter. Being as close as 100 to 300 meters is more stressful and is related to poor health outcomes, such as asthma, cardiovascular disease, coronary heart disease, myocardial infarction, and increased mortality rates (County Health Rankings, 2022a). Bollinger County receives a score of 14 (Figure 33).

These 2019 data are provided by the Environmental Justice Screening and Mapping Tool (U.S. Environmental Protection Agency, 2022d; County Health Rankings, 2022a).



FIGURE 33

Bollinger County Traffic Volume

Average traffic volume per meter of major roadways in the county.

State Range 0 to 1,238

Air Pollution Particulate Matter

Air Pollution Particulate Matter is defined as the average daily density of fine particulate matter in micrograms per cubic meter (PM_{2.5}). Particles such as dirt, dust, soot, smoke are all in the air and some can be seen with the naked eye. These particles can be emitted from construction sites, unpaved roads, smokestacks, and fires. Other sources are emitted from power plants, industries and automobiles. The particles can enter the lungs and the bloodstream increasing the likelihood for serious illness and disease (U.S. Environmental Protection Agency, 2022d). Air pollution in the United States is 7.5; Missouri is 8.2. The minimum for Missouri counties is 6.1 and the highest is 10.7. Bollinger County (Figure 34) has a particular matter of 8.8, which is in the 4th quartile (Centers for Disease Control and Prevention, 2018-2020; County Health Rankings, 2022b). Environmental Regional Air Quality is measured as the number of days per year that are unhealthy for sensitive populations. Lower values are better. Bollinger County has 4.4 unhealth air quality days per year. In 2015 it had 14.3 unhealthy air quality days per year (American Association for Retired Persons, 2022).

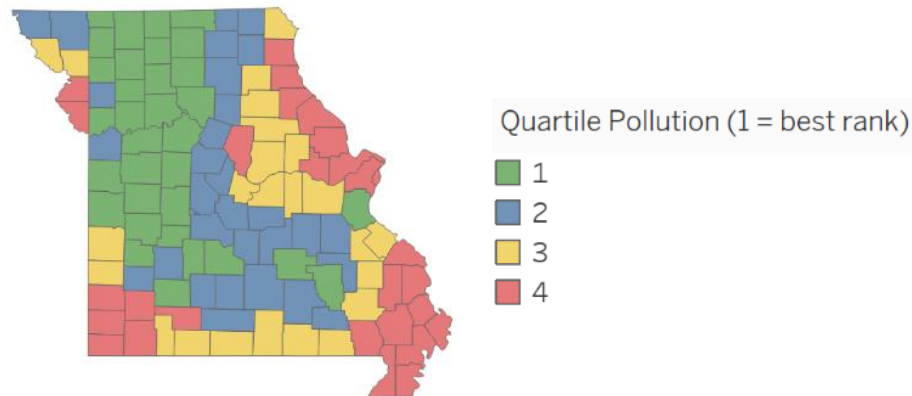


FIGURE 34

Near Roadway and Industrial Pollution

Near Roadway Pollution and Local Industrial Pollution are provided by city in Bollinger County. Values are shown in Table 14. Roadway pollution is defined as the percentage of the population living within 200 meters of a high-traffic road with more than 25,000 vehicles per day. Lower values are better. Industrial pollution is measured as the toxicity of airborne chemicals released from nearby industrial facilities. Values range from 0 to 9,070. Lower values are better (American Association of Retired Persons, 2022; U.S. Department of Transportation, 2015, U.S. Environmental Protection Agency, 2019).

City	Near -Roadway Pollution (%)	Local Industrial Pollution (0 to 9,070)
Marble Hill	0	0
Glennallen	0	0
Sedgewickville	0	0
Zalma	0	0
2022 U.S. Median Neighborhood	0	0

UV Index

The UV Index scale used in the United States conforms with international guidelines for UVI reporting established by the World Health Organization. The UV Index scale ranges from 0 to 11 (U.S. Environmental Protection Agency, 2022c). The higher the index, the more dangerous and high exposure to ultra-violet rays are likely very high to extreme. Figure provides the mean UV Index scale values for Bollinger County from 2006 to 2020. Note in Figure 35, the county has a high value of 10 (very high to extreme) in June and July and a low value of 2 (low risk) in January and December. Protection is needed starting at a value of 3 (Moderate to high), therefore, residents of the county need protection in 10 months of the year.

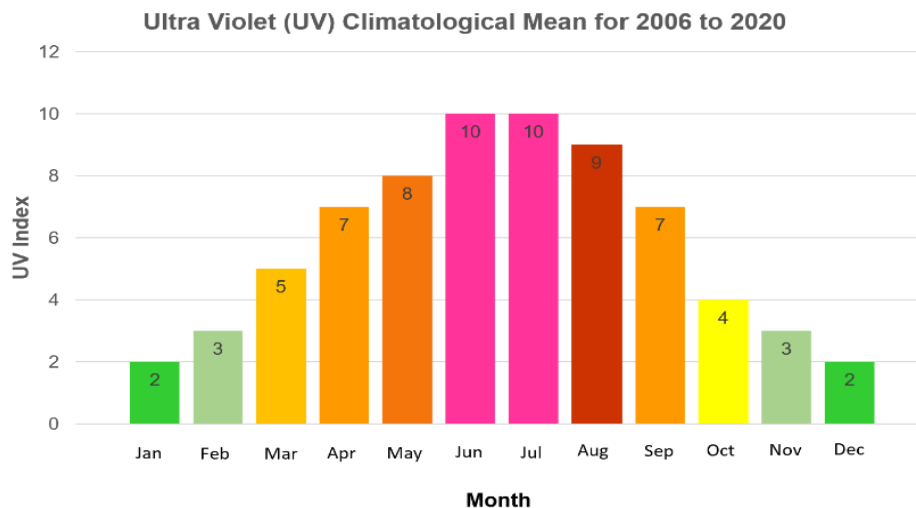


FIGURE 35

Social Vulnerability and Disaster

Every community must prepare for and respond to hazardous events, whether a natural disaster like a tornado or disease outbreak, or a human-made event such as a harmful chemical spill. A number of factors, including poverty, lack of access to transportation, and crowded housing may weaken a community’s ability to prevent human suffering and financial loss in a disaster. These factors are known as social vulnerability.

ATSDR's (Agency for Toxic Substances and Disease Registry, 2022) Geospatial Research, Analysis & Services Program (GRASP) created databases to help emergency response planners and public health officials identify and map communities that will most likely need support before, during, and after a hazardous event.

The data considers census tracts and their performance on four themes:

1. Socioeconomic Status
2. Household Composition and Disability
3. Minority Status and Language
4. Housing Type and Transportation

Each major theme (e.g., Socioeconomic Status) has several subthemes as illustrated in Figure 36 (e.g., below poverty).

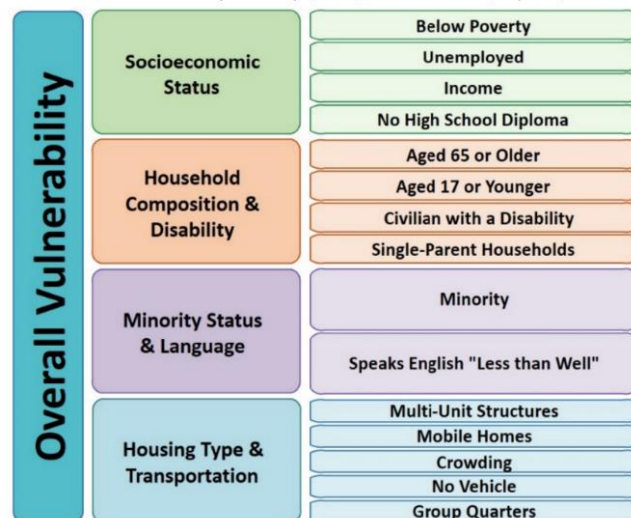


FIGURE 36

Table 15 on the percentile rank for theme have values in each cell ranging from a 0 to 1, with higher values indicating more problematic areas for that theme.

Table 15. Social Vulnerability Index by Census Tract – Percentile Ranking for Theme					
Census Tract	Themes				Overall Percentile Ranking
	Theme 1: Socioeconomic	Theme 2: Household Composition	Theme 3: Minority Status/Language	Theme 4: House Type/Transportation	
9503	0.74	0.60	0	.20	.39
9501	0.58	0.45	.26	.86	.60
9502	0.85	0.96	.40	.81	.90

Values for the subthemes, provided in Table 16, are given a 1 if they are above the 90th percentile for the variable (indicating worse performance) and a 0 if they are below the 90th percentile (indicating better performance). Subthemes that are flagged (a high value of concern) are provided for each census tract. Additionally, the total number of flags for all subthemes and themes are provided.

The data indicate that census tract 9503 has 2 flags assigned to a theme. Census tracts 9501 and 9502 have one flag across the four dimensions. Figure 37 provides the location of census tracts for Bollinger County. Percentile ranking values range from 0 to 1, with higher values indicating greater vulnerability.

Table 16. 90% number of Flags Indicating Concern for a Census Tract		
	Number of Flags (more flags = worse values)	
Census Tract	Number of Subthemes (1 flag)	Total Number of Flags
9503	1. Persons with a disability 2. Mobile homes	2
9501	3. Persons with a disability	1
9502	4. Persons with no high school diploma	1

2020 Census – Census Tract Reference Map: Bollinger County, MO

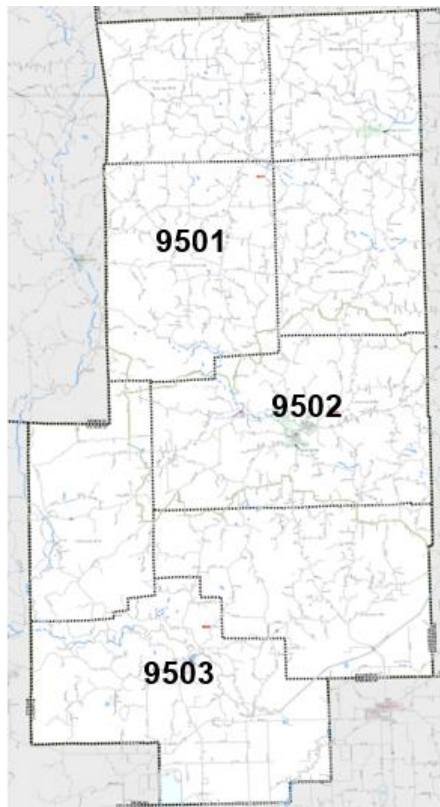


FIGURE 37

Social and Mental Health

This category represents social and mental factors and conditions which directly or indirectly influence overall health status and individual and community quality of life. Mental health conditions and overall psychological well-being and safety may be influenced by substance abuse and violence within the home and within the community. Waters (2022) stated, “our social health depends on connection to others. And social health supports health” (para. 5). Social health is about how connected you are to people. The Centers for Disease Control and Prevention (2021) stated that:

mental health includes our emotional, psychological, and social well-being. It affects how we think, feel, and act. It also helps determine how we handle stress, relate to others, and make healthy choices. Mental health is important at every stage of life, from childhood and adolescence through adulthood. (para. 1)

Social Associations

The number of social associations is a good indicator of the potential for citizen outreach and engagement. Figure 38 shows that Bollinger County is in the 1st quartile (lowest quartile) and has 11 active organizations in the county for a rate of 9.1 per 10,000 residents (U.S. Census Bureau, 2019).

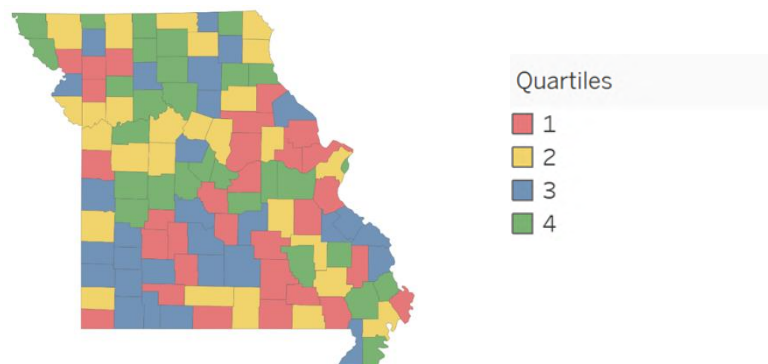


FIGURE 38

Frequent Poor Mental Distress

Percentage of adults reporting 14 or more days of poor mental health per month (age-adjusted) is reported by the County Health Rankings (2022a). Figure 40 provides the quartiles of poor mental distress for Missouri by county. The higher the quartile, the more days reported of mental distress. Bollinger County is in the 3rd quartile and 19% of individuals reported 14 or more days of poor mental health per month.

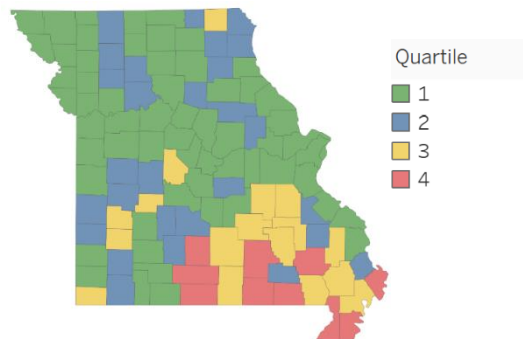


FIGURE 39

Deaths of Despair

Deaths of despair (2014-2020) include deaths from the following (Figure 41):

- Suicide
- Alcohol-related disease
- Drug overdoses

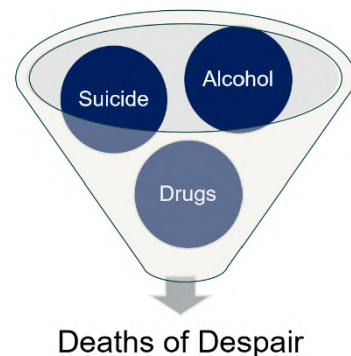


FIGURE 40

Deaths of Despair - Suicide

The term originated with Princeton economists Anne Case and Angus Deaton who sought to determine the reason for U.S. life expectancies not seen since the early 1990s. The rise was because of these three causes of death (Case & Deaton, 2020).

Suicide is a major public health problem. The American Public Health Association (2021) states that:

This is a major public health concern that impacts individuals, families, and communities. It's a complex issue with multiple contributing factors. So prevention measure must also be multifaceted. The public health approach aims to reduce the factors that increase the likelihood of suicide and uplift those that protect against it. We must work together to reduce stigma and ensure everyone has access to mental health care. (para. 2)

Suicide is a leading cause of death worldwide. In 2019, more than 700,000 people died by suicide, one in every 100 deaths (World Health Organization, 2022). The highest rates of suicide in 2022 is Lesotho at 72.4 at 100,000 which is a country surrounded by South Africa. The lowest suicide rate is Antigua and Barbuda at .4 per 100,000, which lies between the Caribbean Sea and the Atlantic Ocean (World Population Review, 2022a).

Suicide is a leading cause of death (12th) in the United States in ages 1 to 85+ years with 45,979 deaths in 2020 (Centers for Disease Control and Prevention, 2020). Table 17 provides statistics on suicide (Substance Abuse and Mental Health Administration, 2021).

Table 17. National Suicide Statistics
• 12.2 million American adults thought about suicide
• 3.2 million planned a suicide attempt
• 1.2 million attempted suicide
• 1 suicide occurs every 11 minutes
• Ages 10 to 64 years, suicide was among the top 9 leading causes of death
• Ages 10 to 14 years and 25 to 34 years, suicide was the second leading cause of death

In the State of Missouri, there were 3,496 deaths by suicide from 2018 to 2020 with a state crude rate of 19 per 100,000 (U.S. Centers for Disease Control and Prevention, 2018-2022):

- St. Louis City, Missouri had 14 suicides per 100,000 (1st quartile).
- Cass County, Missouri had 27 suicides per 100,000 (4th quartile).
- Bollinger County's values for death by suicide were suppressed for confidentiality, indicating they were less than 10 cases (Figure 42).

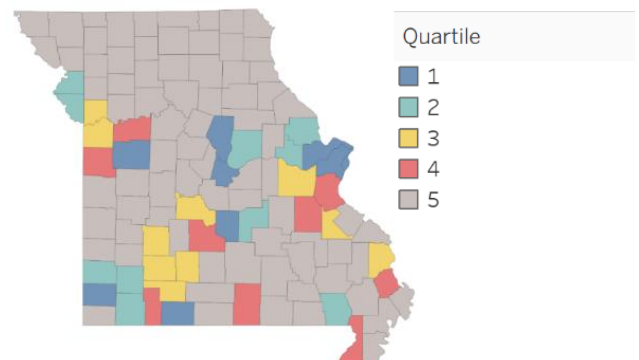


FIGURE 41

Deaths of Despair - Alcohol-Related Disease Deaths

Only 18 counties had values represented for alcohol-related disease deaths (Table 18). Counties with less than 19 values are either suppressed or unreliable. These deaths, using data from 2018 to 2020, are coded as X45, X65 and Y15 under the ICD-9 Codes (International Classification of Disease and Death). Values in Missouri ranged from 1.2 persons per 100,000 (Jackson County) to 19.1 per 100,000 (St. Louis City). Bollinger County values were suppressed (less than 10 counts) for alcohol-related disease death (Centers for Disease Control and Prevention, 2018-2022).

County	Crude Rate per 100,000	County	Crude Rate per 100,000	County	Crude Rate per 100,000
St. Louis City	19.1	Platte	13.1	Jasper	8.3
Camden	18.8	Cole	11.3	Cass	8.2
Greene	17.6	Jefferson	10.8	St. Charles	8
Butler	15.7	Clay	10.3	St. Louis	7.8
Christian	14.3	Franklin	9	Boone	6.6
Jackson	14.3	Buchanan	8.4	Jackson	1.2

Deaths of Despair - Drug Overdoses

Unintentional drug poisoning (overdoses) employed ICD-9 Codes X40-X44 for years 2018 to 2020. Figure 43 shows the counties that provided data (i.e., are not suppressed). Bollinger County is not represented in the deaths of despair for drug overdoses data because of suppression. The highest geographic area is St. Louis City with 83 overdoses per 100,000. The lowest is Platte County with 12 per 100,000 population (Centers for Disease Control and Prevention, 2018-2020).

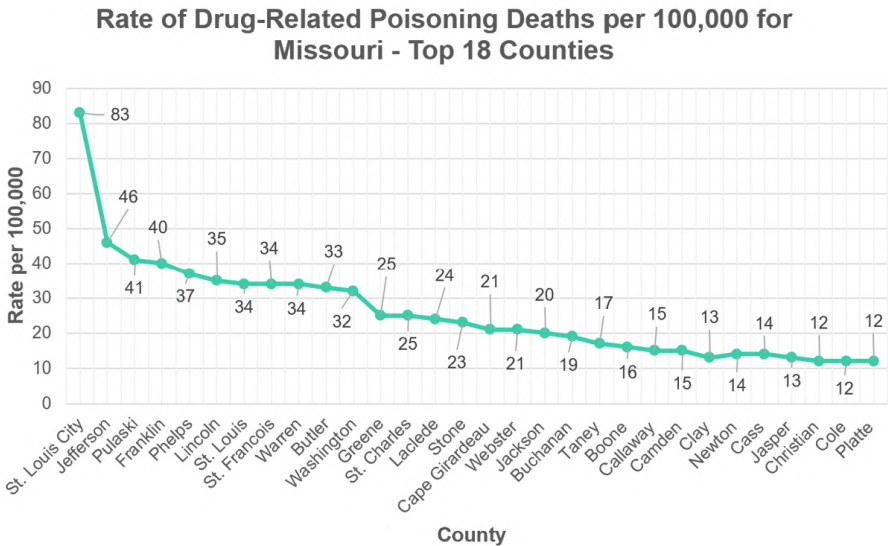


FIGURE 42

Crime Offenses

The 2021 all crime rate for Missouri is 36 per 1,000 residents with 224,661 actual offenses (Missouri State Highway Patrol, 2022a). Figure 44 shows the quartiles for crime rates by county. Counties not shaded have missing data. The yellow and red counties have the highest crimes rates. Bollinger County has a crime rate of 26 per 1,000 residents (with 309 offenses) and is in the 3rd quartile (next highest crime).

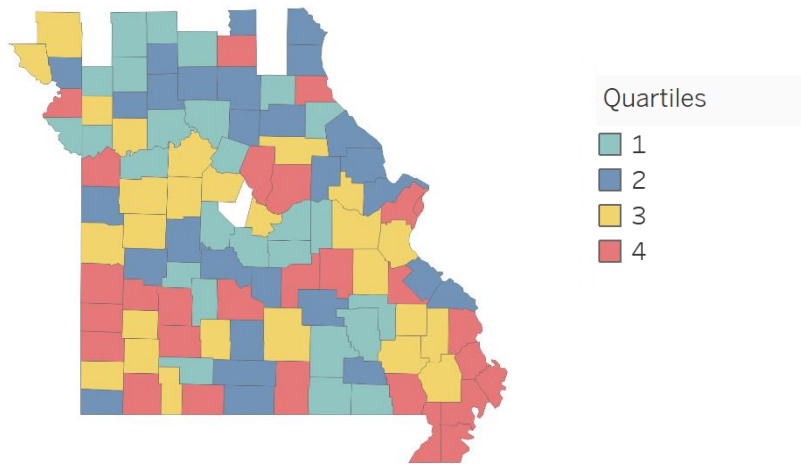


FIGURE 43

Related to offenses against people in 2021, in Figure 45, Bollinger Girardeau County was highest in aggravated assault (70) and aggravated assault and intimidation (63). Bollinger County's population was 10,567 in 2021.

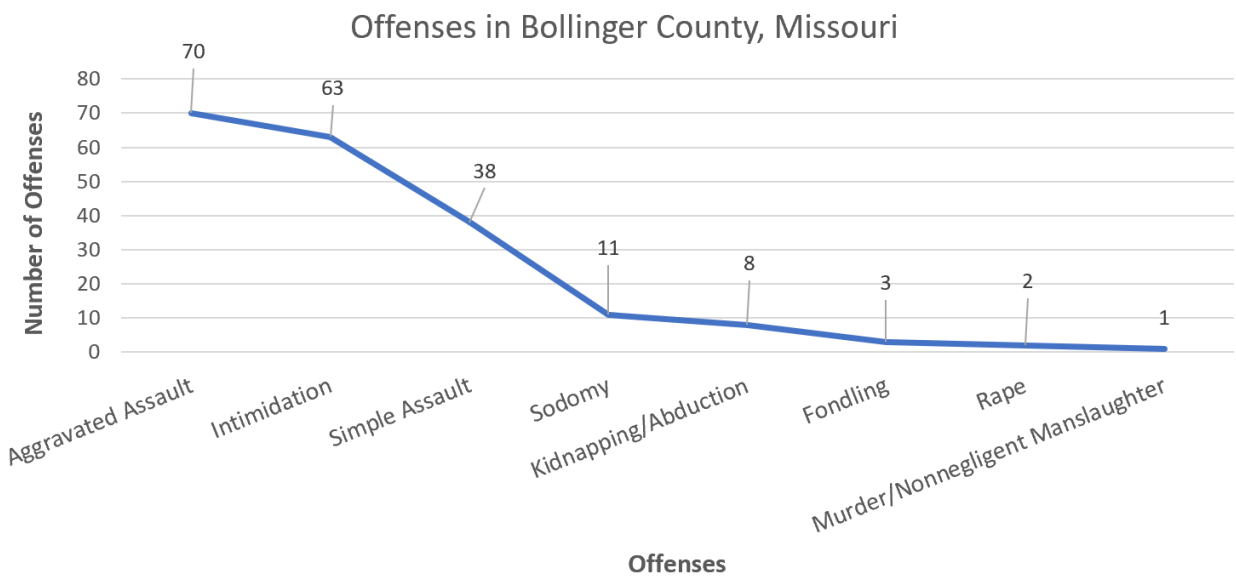


FIGURE 44

Crimes against society (Figure 46) were reported as 70 for the county in 2021. There were 26 drug/narcotic violations, 19 drug equipment violations and 17 weapon law violations. Figure 47 illustrates the crimes against property (197) in the county (2021). There were 46 vandalism offenses, 36 burglaries, 34 larceny offenses. Figure 48 provides the offense type by age cohort (i.e., under 18 and over 18 years). Aggravated assault (61), intimidation (50), and simple assault (28) are noted for all ages. Bollinger County's population was 10,567 in 2021 (Missouri State Highway Patrol, 2022a).

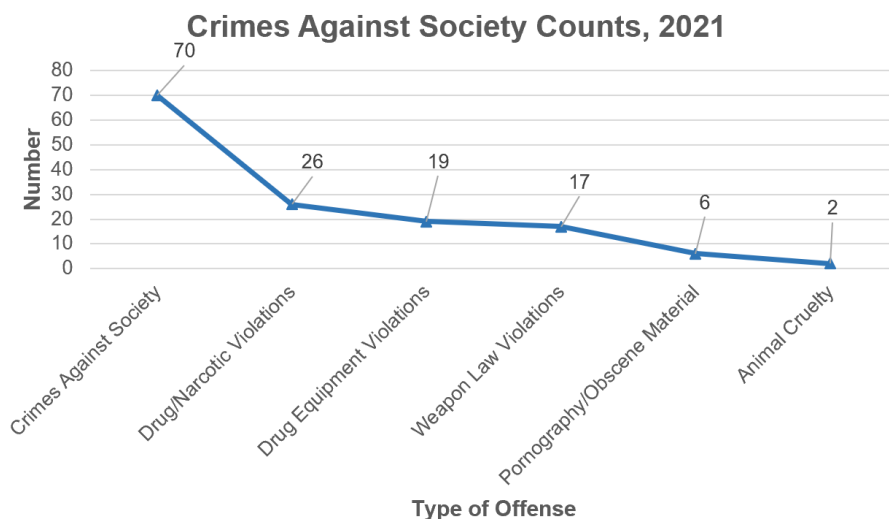


FIGURE 45

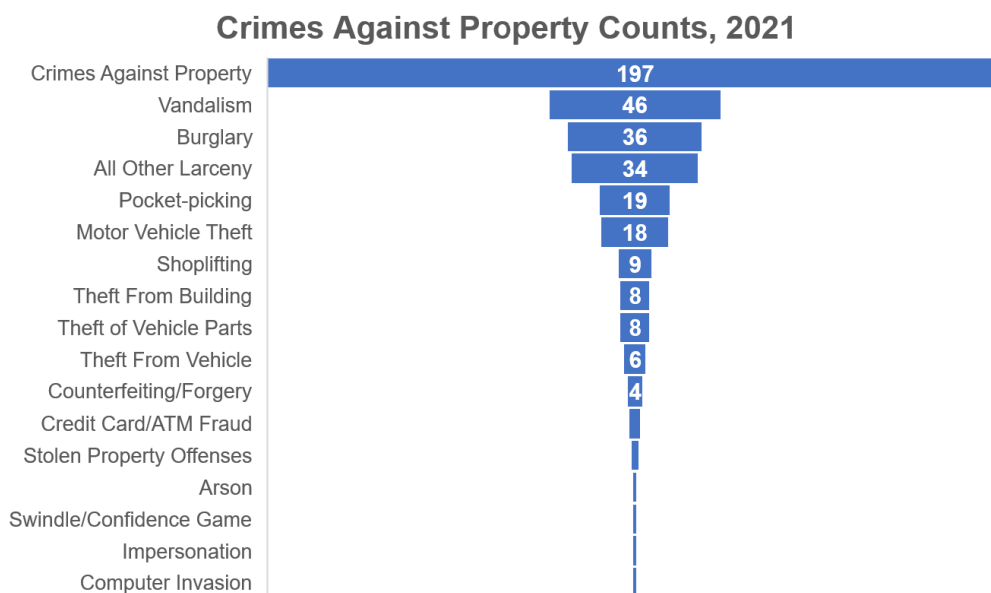


FIGURE 46

Offense Type Count by Age Cohort, 2021

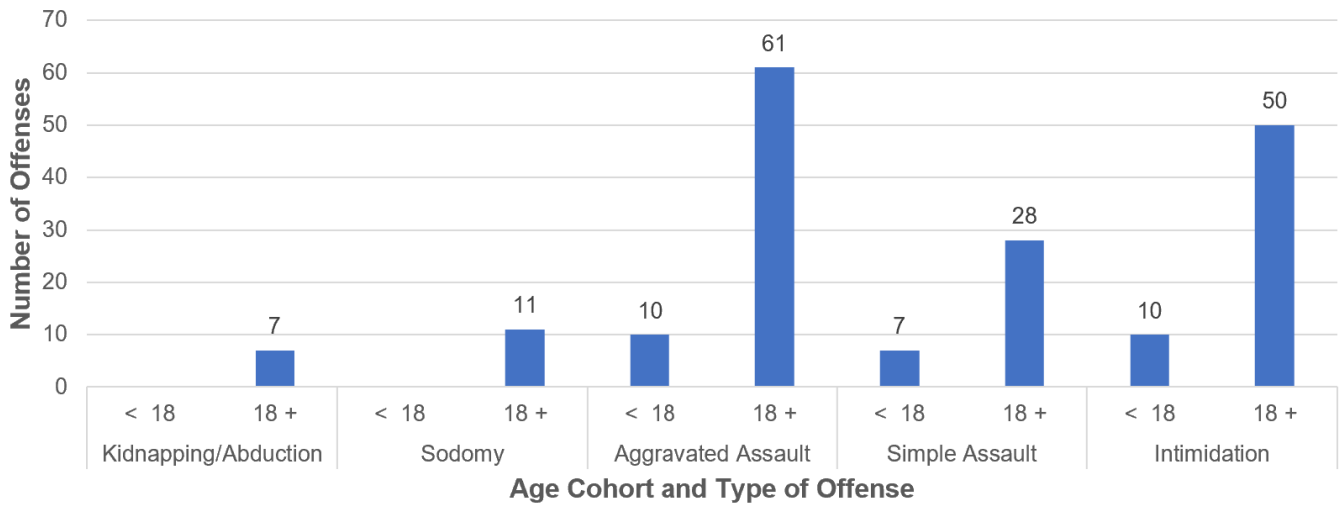


FIGURE 47

Data related to alcohol and drugs were provided by the Missouri Courts online repository of 2021 drug and alcohol charges filed and disposed (Missouri Courts, 2022). For Bollinger County in 2021, there were 53 court cases involving alcohol and drugs. Sixty percent were held in associate court, while 38% were held in circuit court.

- 32% related to alcohol
- 66% related to drugs

For Table 19, unlawful use of a weapon, possession of control substances, possession of marijuana, unlawful possession of drug paraphernalia, and DWI. were the top offenses for Bollinger County (2021). Those offenses totaled 50% of all 53 offenses.

Table 19. Missouri Judiciary Criminal System – Alcohol and Drug Related Charges (Filed and Disposed) 2021

Offense	Frequency	%	Offense	Frequency	%
Delivery Or Possession Of A Controlled Substance At County/Private Jail/Correctional Center Except With Prescription	2	4	Minor Visibly Intoxicated/Blood Alcohol Content More Than .02% - 1st Offense	1	2
Take, Attempt To Take Or Possess Furbearers In Closed Season By Hunting Methods	1	2	Possession Of Controlled Substance Except 35 Grams Or Less Of Marijuana/Synthetic Cannabinoid	4	8
Consumption Of Alcoholic Beverage While Driving	2	4	Possession Of Marijuana/Synthetic Cannabinoid Of 10 Grams Or Less	3	6
Delivery Of Controlled Substance Except 35 Grams Or Less Of Marijuana Or Synthetic Cannabinoid	2	4	Possession Of Marijuana/Synthetic Cannabinoid Of 10 Grams Or Less - Prior Drug Offense	4	8
Distribution Of A Controlled Substance In A Protected Location	2	4	Possession Of Marijuana/Synthetic Cannabinoid Of 11-35 Grams	2	4
DWI	3	6	Purchase/Attempt To Purchase Or Possession Of Liquor By Minor - 1st Offense	2	4
DWI - Aggravated	2	4	Purchase/Attempt To Purchase Or Possession Of Liquor By Minor - 2nd Or Subsequent Offense	1	2
DWI - Persistent	2	4	Unlawful Possession Of Drug Paraphernalia	4	8
DWI - Person Less Than 17 Years of Age In Vehicle	1	2	Unlawful Possession Of Drug Paraphernalia - Amphetamine Or Methamphetamine	2	4
DWI - Prior	2	4	Unlawful Possession Of Drug Paraphernalia - Prior Drug Offense	3	6
Failure To Comply With Ignition Interlock Device Requirements	1	2	Unlawful Use Of Weapon - Subsection 11 - Possess Weapon And A Felony Controlled Substance	4	8
Manufacture Of A Controlled Substance - Except 35 Grams Or Less Marijuana/Synthetic Cannabinoid	2	4			

Crime by City

Table 20 provides the data for crimes reported and cleared by the Bollinger County Sheriff’s Department and Marble Hill Police Department (Federal Bureau of Investigation, 2022). Spark lines are provided to show the trends from 2010 to 2020. Violent reported by the Bollinger Sheriff Department was low in the last decade and increased, then decreased. Property crime has seen a downward trend. For Marble Hill Police Department, violent crime has remained low, but property crime was higher in the early part of the last decade and is now seeing an increasing trend.

Table 20. Trends of Violent and Property Crimes by City

Year	Bollinger Sheriff Violent Crimes	Bollinger Sheriff Property Crimes	Marble Hill Violent Crime	Marble Hill Property Crimes
2010	3	66	3	13
2011	13	105	13	14
2012	12	79	3	30
2013	22	65	1	36
2014	9	93	1	11
2015	16	103	0	11
2016	66	87	0	16
2017	11	76	0	19
2018	13	38	0	7
2019	57	64	0	7
2020	33	71	2	20
Sparklines				

Intimate, Family, and Non-Intimate Violence

Domestic violence is a public health problem. It is also called intimate partner violence, battery, or spousal abuse. In Figure 49, the state rates are well above the county rate except in 2016. Figure 50 provides the number of incidents by offense and victim to offender relationship for the county. Murder, kidnapping, rape, sexual assault with an object, fondling, human trafficking sex and labor, extortion, and robbery were not included because of extremely low rates. Rates worth noting are Bollinger Family - sodomy, aggravated assault, and intimidation and Bollinger Intimate - aggravated assault, simple assault, and intimate intimidation (Missouri State Highway Patrol, 2022a).

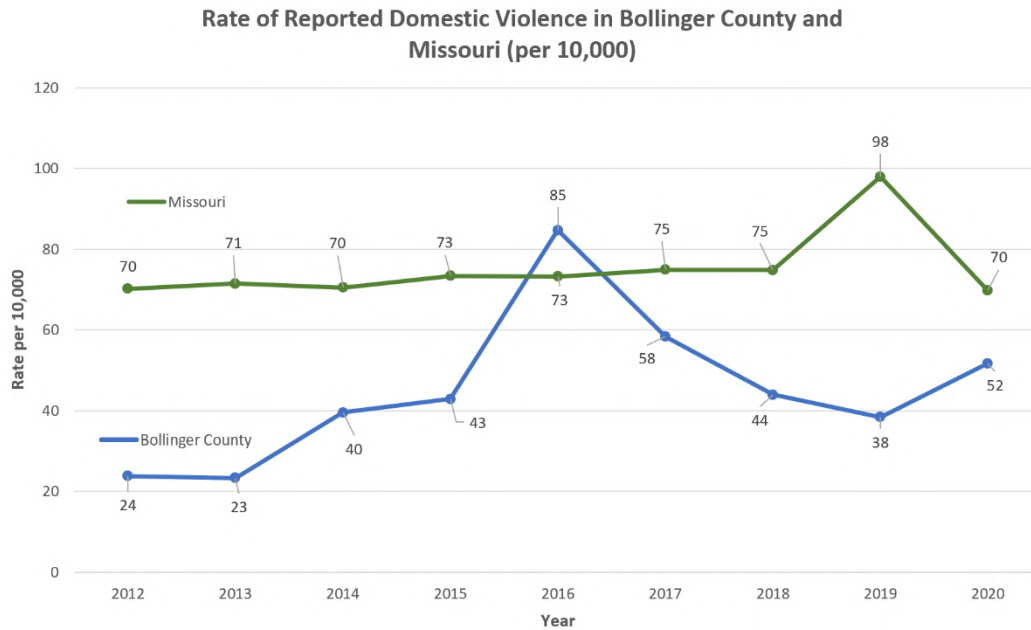


FIGURE 48

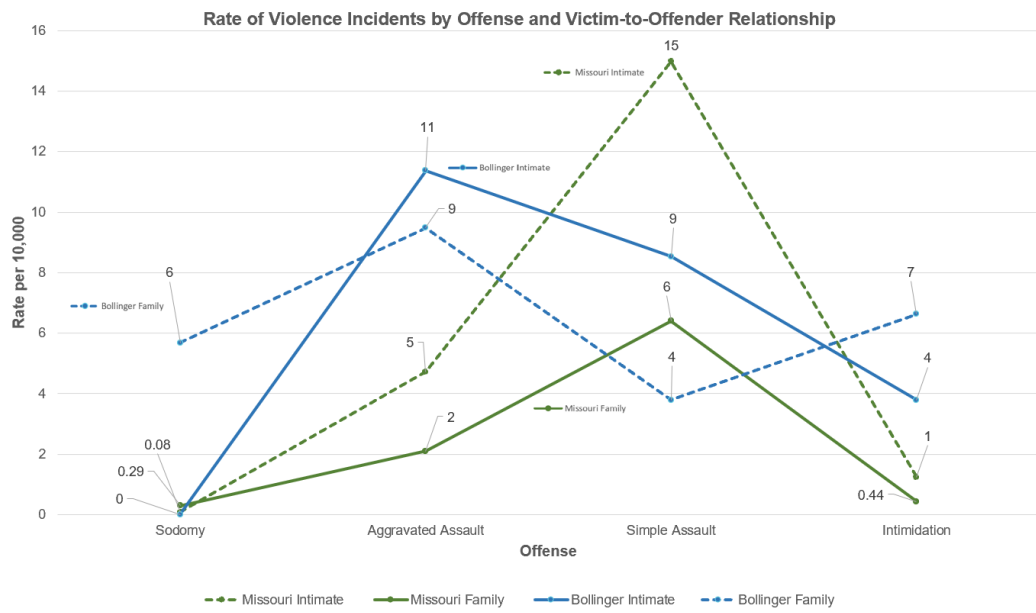


FIGURE 49

Maternal and Child Health

Improving the well-being of mothers, infants, and children is an important public health goal for the United States. Their well-being determines the health of the next generation and can impact future public health challenges for families, communities, and the health care system. (Office of Disease Prevention and Health Promotion, para. 1, 2022)

One of the most significant areas for monitoring and comparison relates to the health of vulnerable populations: infants and children. This category focuses on birth data and outcomes as well as mortality data for infants and children. Because maternal care is correlated with birth outcomes, measures of maternal access to, and/or utilization of, care is included. Births to teen mothers are a critical indicator of increased risk for both mother and child.

For Bollinger County, Missouri (Population 10,207 in 2022), the crude birth rate remained somewhat steady in the last decade from 12 per 1,000 residents to 13 per 1,000 residents (Figure 51). Data in this section are from the Missouri Department of Health and Human Services (2022), World Population Review (2022b), and the U.S. Census Bureau (2022f).

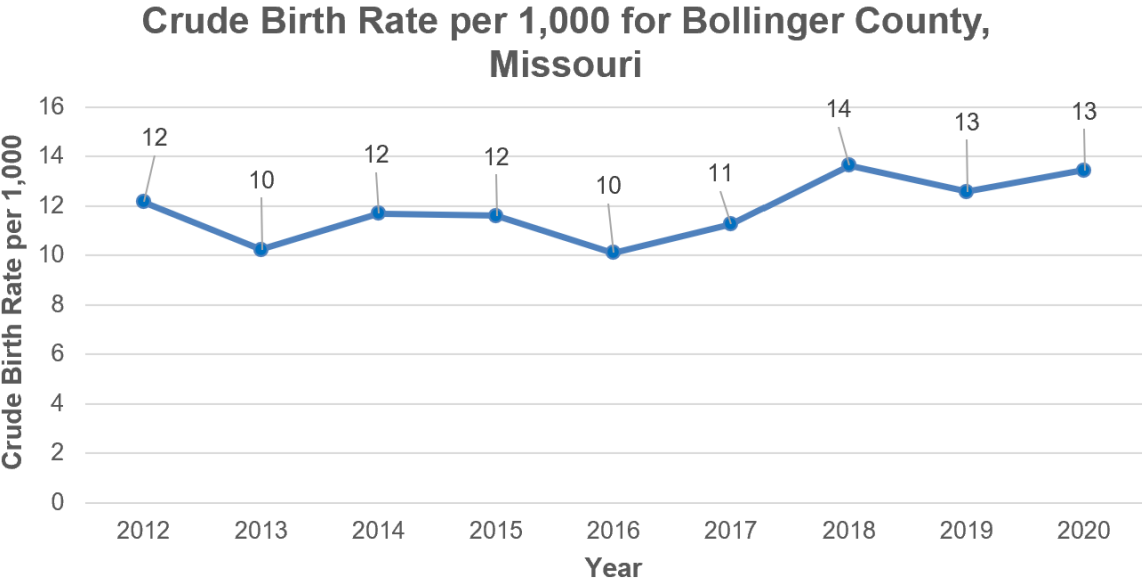


FIGURE 50

In all cases, counts and rates were not provided for Black, American Indian/Alaska Native, Asian/NHOPI, and other race because of the confidentiality rule. Figure 51 indicates the number of deliveries, live births, and fetal deaths for Bollinger County.

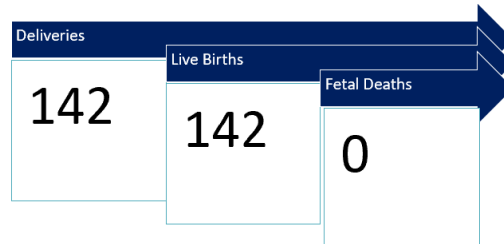


FIGURE 51

Table 22 relates to pregnancy rates and live births by age cohort. The highest counts of pregnancy and births are in the 25 to 29 age cohort. Figure 52 illustrates 2020 characteristics about prenatal care per 100 women in Bollinger County (Missouri Department of Health and Human Services, 2022).

Normal weight is considered a Body Mass Index (BMI) between 18.5 and 24.9; Overweight is considered a BMI between 24 and 29.9. Obesity is a BMI of greater than 30. Overweight and obesity are a concern for 31 and 40 out of 100 women, respectively (Figure 53). There were 15 per 100 women who had babies preterm (less than 37 weeks) and 8 per 100 babies who were small for gestational age (Figure 54). Figure 55 shows that 36 out of 100 women have less than 12 years of education at the time of their babies birth. Figure 56 illustrates shows that for women and smoking: 23 out of 100 smoked at all during pregnancy and 6 out of 100 smoked 1 or more packs per day.

Age	Pregnancy Count	Live Birth Count
10 - 14	-	-
15 - 17	-	-
18 - 19	8	8
20 - 24	44	44
25 - 29	45	45
30 - 34	32	32
35 - 39	10	10
40 +	-	-
Total	142	142

About Prenatal Care in Bollinger County (per 100)

- 142 Pregnancies and 142 Live Births.
- 74 women began prenatal care in first trimester.
- 10 women had an inadequate Missouri Prenatal Care Adequacy Index.
- 31 women were on food stamps during the prenatal period.
- 49 women were on Medicaid during the prenatal period.
- 51 women per 100 were on WIC during the prenatal period.

FIGURE 52

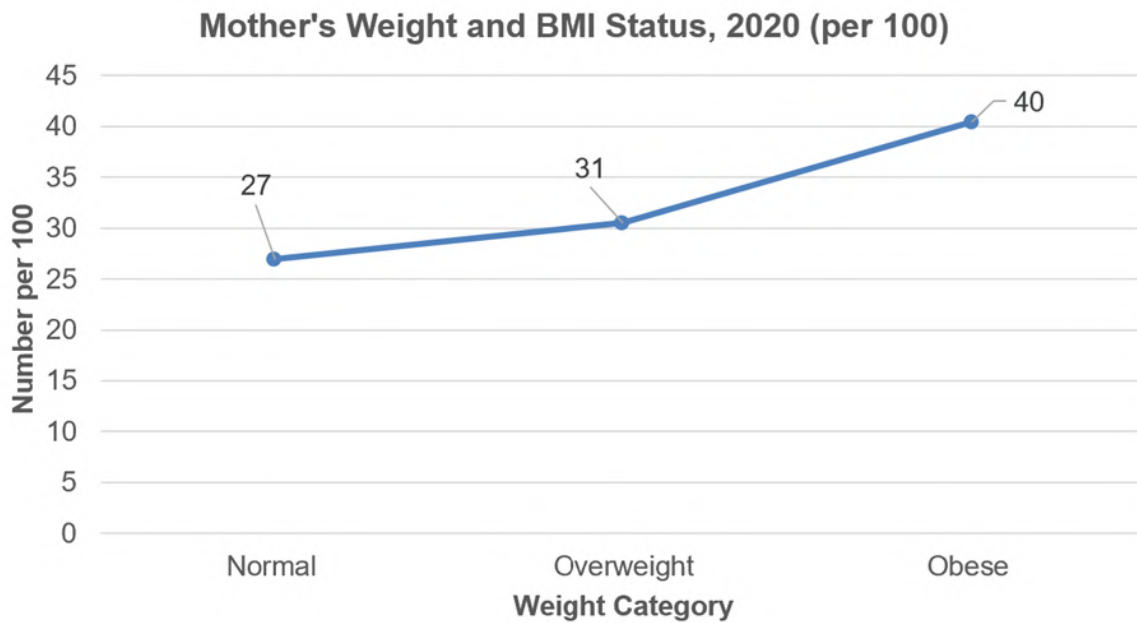


FIGURE 53

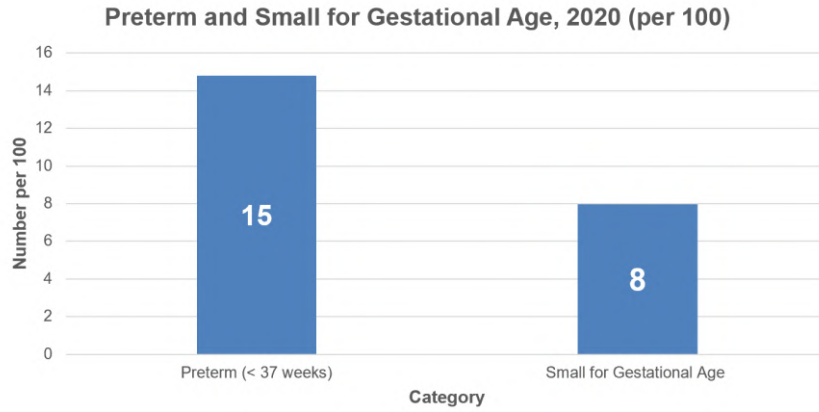


FIGURE 54

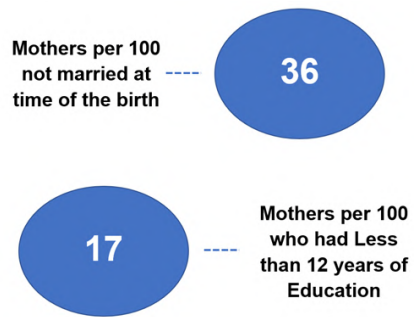


FIGURE 55

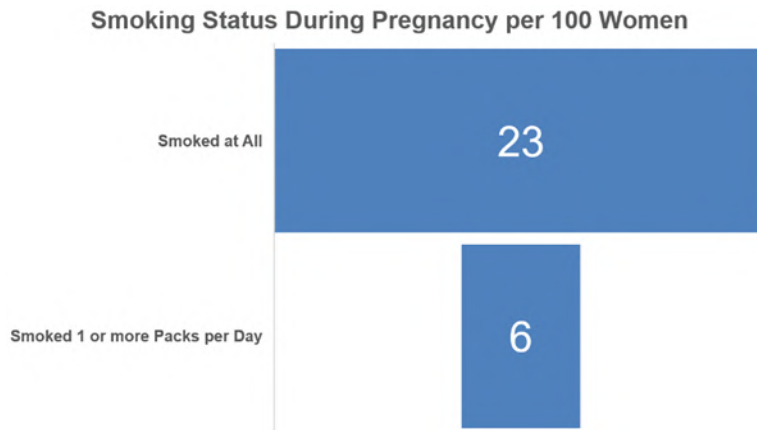


FIGURE 56

Teen Births

Birth to teen mothers can be a traumatic event and can lead to serious health and social outcomes for the mother and child. Teen pregnancy disrupts education, social development, and increases physical stress. Teen births is the number of births to females ages 15-19 per 1,000 females in a county. Missouri has a teen birth rate of 23 per 1,000, while Bollinger County has a rate of 29 per 1,000 (Figure 57) which places it in Quartile 3 (National Center for Health Statistics, 2022).

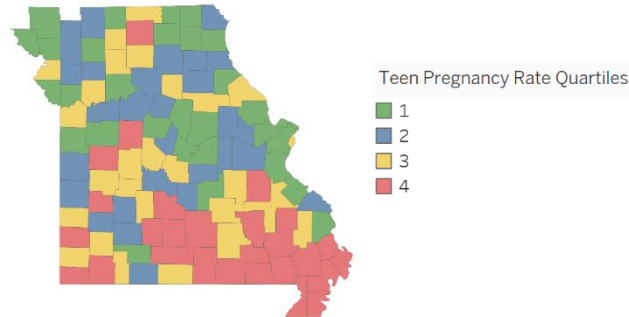


FIGURE 57

Infant and Child Mortality

Infant and child mortality has serious consequences for individuals, families, and society. When an infant or child dies, this is a loss of years of potential. Infant mortality measures the number of deaths among children less than one year of age per 1,000 live births. Number of deaths among residents under age 18 per 100,000 population. Missouri has an infant mortality rate of 6 per 1,000 live births and a child mortality of 57 per 100,000. Bollinger County has no infant mortality (Figure 58) or child mortality (Figure 59) with data provided by the National Center for Health Statistics (2022).

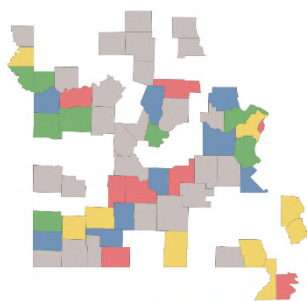


FIGURE 58

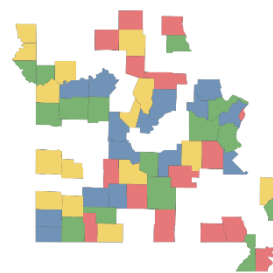


FIGURE 59

Single-Parent Household

In the United States, 25% of children live in single-parent homes. In the state of Missouri, over 25% of children (i.e., 338,267 children out of 1,372,817 children in households) live in a single-parent household. As shown in Figure 60, Bollinger County, with 2,642 children in households, is in the first quartile with 15% of children in single-parent households (N = 386). For comparison, Osage County, Missouri and St. Louis City, Missouri have just over 10% (minimum) and 48% (maximum) of children living in a single-parent household, respectively (2016-2020). Data in this section are from the U.S. Census Bureau (2022h) and County Health Rankings (2022a).

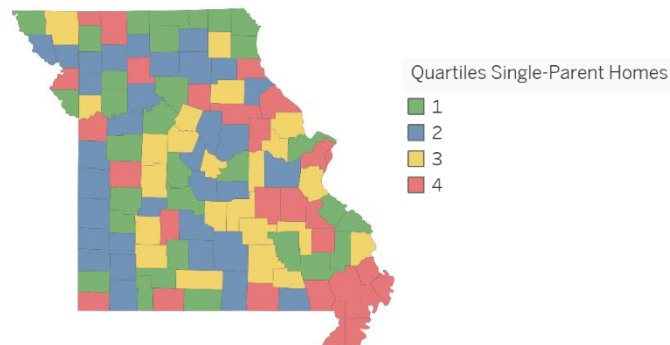


FIGURE 60

Homelessness

Homeless has tragic outcomes for children. Nationally, between 2012 and 2013, homelessness grew by 8% among children. Each year, an estimated 4.2 million youth and young adults experience homelessness in the United States.

As of January 2019-2020, in Missouri, (Missouri Department of Elementary and Secondary Education, 2022) there were 34,942 enrolled homeless students. Other characteristics include:

- 2,072 were in shelters
- 29,965 were doubled up
- 812 were unsheltered
- 2,093 were living in hotels/motels

This experience can be traumatic, dangerous, and lead to dropping out of school (Substance Abuse and Mental Health Administration, 2022). According to data from the Missouri Department of Elementary and Secondary Education (DESE), there are 54 homeless students in Bollinger County in a 2019 to 2020 school district census (Table 23).

School District	Count
Leopold R-III	0
Meadow Heights R-II	39
Woodland R-IV	4
Zalma R-V	11
Total	54

Disconnected Youth, Reading and Math Scores, Percentage in Free or Reduced Lunch

Students have characteristics that can be a risk factor for poor health outcomes and future success, such as connectedness, reading and math scores, and the percentage of students enrolled in a free or reduced lunch. Disconnectedness is defined as a percentage of teens and young adults ages 16-19 who are neither working nor in school (2016 to 2020). Reading score (2018) is defined as the average grade level performance for 3rd graders on English Language Arts standardized tests. Math score (2018) is termed the average grade level performance for 3rd graders on math standardized tests (Fahle et al., 2018).

Feeling a connection to the community and peer groups is necessary for a student to feel supported and increases the likelihood of prosocial behavior. Reading and math scores establish a foundation for learning and increase confidence. Reading is a skill used across curriculum areas. Math skills increase critical thinking and fosters the ability to solve problems through numbers and symbols. The county is at grade level with reading and math scores. They are above the percentage enrolled in free or reduced lunch (Table 24).

Geography	Percentage Disconnected Youth	Reading Scores	Math Scores	% Enrolled in Free or Reduced Lunch
Bollinger	Not reported	3	3	64
Missouri	7	3	3	50

Youth Mental Health and Substance Misuse (6th through 12 Graders)

Youth experience with alcohol can begin at a very early age. Tables 25,26,27, and 28 provide details on substances, use, and perception (Missouri Department of Mental Health, 2022). High values are shaded red.

Approximate Sample Size Student used...	2022 Bollinger County Data 80 %	2022 MO Data 1804 %	2020 County Data 300 %
Tobacco (cigarettes or chew)	7	3	16
Electronic cigarettes	18	11	20
Hookahs or water pipes	4	1	2
Alcohol	17	15	20
Marijuana	5	8	4
Inhalants	1	1	1
Rx not prescribed for you by a doctor	3	1	10
“OTC” to get high	1	1	4
Synthetic drugs	0	1	0

Table 26. Missouri Student Survey: Behaviors in the Last 30 Days			
Behavior or Condition	Bollinger (N = 80) %	Missouri (N = 1804) %	2020 County Data (N = 300) %
Used cocaine or `crack`	1	.3	0
Used heroin or `smack`	0	.2	.4
Used hallucinogens such as LSD, PCP, or magic mushrooms	3	1	1
Used methamphetamine (meth, crank, crystal, ice)	1	.2	0
Used `club drugs` such as ecstasy	1.3	.2	.4
<u>Behavior: Last 30 Days (% reflects "1+" answer)</u>			
Missed whole day(s) of school because you skipped or cut	47	34	42
Did not go to school because you felt you would be unsafe at school or on your way to or from school	7	10	6
Rode with someone who was drinking alcohol	17	15	18
<u>Behavior: Last 3 Months (% reflects "1+" answer)</u>			
Spread mean rumors or lies about other kids at school	10	14	22
Posted online or sent text that might embarrass/hurt another student	16	17	24
Made fun of other people	41	44	57
Hit, shoved, pushed another student and were not just fooling around	16	14	24
<u>Behavior: Last 12 Months (% reflects "1+" answer)</u>			
Were in a physical fight	21	18	23
Been threatened or injured with a weapon on school property	4	8	8
Seriously considered suicide	11	11	9
Planned suicide	3	8	9
Attempted suicide	3	4	6
<u>Depression Scale (% often or always in Past Month)</u>			
Were very sad	25	28	28
Were grouchy or irritable, or in a bad mood	34	36	40
Felt hopeless about the future	16	16	18
Felt like not eating or eating more than usual	22	24	25
Felt like sleeping a lot more or a lot less than usual	28	38	35
Had difficulty concentrating on school work	34	38	31

Table 27. Missouri Student Survey: Perceptions			
Perception	Bollinger (N = 80)	Missouri (N = 1804)	2020 County Data (N = 300)
<u>Parents feel it would be “wrong” or “very wrong to...</u>			
smoke tobacco	89	94	82
take one or two drinks of an alcoholic beverage nearly every day	89	95	83
smoke marijuana once or twice a week	91	93	90
use Rx drugs that have not been prescribed to you	91	97	92
<u>Friends' perception of wrongness (% reflects wrong + very wrong)</u>			
Friends feel it would be “wrong” or “very wrong to...			
smoke cigarettes	73	81	70
take one or two drinks of an alcoholic beverage nearly every day	70	76	59
smoke marijuana	77	71	73
use RX drugs not been prescribed to you	86	90	86
<u>Perception of Availability (% very easy + sort of easy)</u>			
'Very' or 'sort of easy' to get cigarettes	39	35	55
'Very' or 'sort of easy' to get e-cigarettes	37	46	53
'Very' or 'sort of easy' to get alcohol	35	51	60
'Very' or 'sort of easy' to get marijuana	25	34	39
'Very' or 'sort of easy' to get RX drugs that have not been	20	20	30
<u>Friends' Perception of Coolness (% reflects pretty cool + very cool)</u>			
Peers believe someone your age would be 'pretty cool' or 'very cool' if they smoked cigarettes	15	7	13
Peers believe someone your age would be 'pretty cool' or 'very cool' if they used e-cigs, mods, or vapes	27	15	22
Peers believe someone your age would be 'pretty cool' or 'very cool' if they drank alcohol	27	20	32
Peers believe someone your age would be 'pretty cool' or 'very cool' if they smoked marijuana	23	17	22

Table 28. Perception of Harm (% reflects slight risk + no risk at all)			
Perception	Bollinger (N = 80)	Missouri (N = 1804)	2020 County Data (N = 300)
used e-cigarettes	37	33	39
smoke one or more packs of cigarettes /day	22	18	28
drink alcohol (no dosage specified)	37	45	48
take one or two drinks of an alcoholic beverage nearly every day	46	32	49
have 5+ drinks, once or twice a week	46	22	36
smoke marijuana once or twice a week	33	39	35
use any other illegal drugs or club drugs	13	10	14
use synthetic drugs	14	16	16
use Cold/ Cough Medicines or OTC medicines to get high	22	22	24
use Rx drugs that have not been prescribed to them	13	11	18

Death, Illness, and Injury

Health status in a community is measured in terms of mortality (rates of death within a population) and morbidity (rates of the incidence and prevalence of disease). Mortality may be represented by crude rates or age-adjusted rates (AAM); by degree of premature death (Years of Productive Life Lost or YPLL); and by cause (disease - cancer and non-cancer or injury - intentional, unintentional). Morbidity may be represented by age-adjusted (AA) incidence of cancer and chronic disease.

Overall Health Factors and Health Outcomes

The County Health Rankings (2022a) provides data that describes counties according to grouped variables, such as health factors and health outcomes. Figure 61 defines the variables involved in measuring health factors, such as health behaviors, clinical care, social and economic factors and physical environment (13 variables used in ranking).² Health Outcomes use variables to describe length of life and quality of life (5 variables used in ranking).³

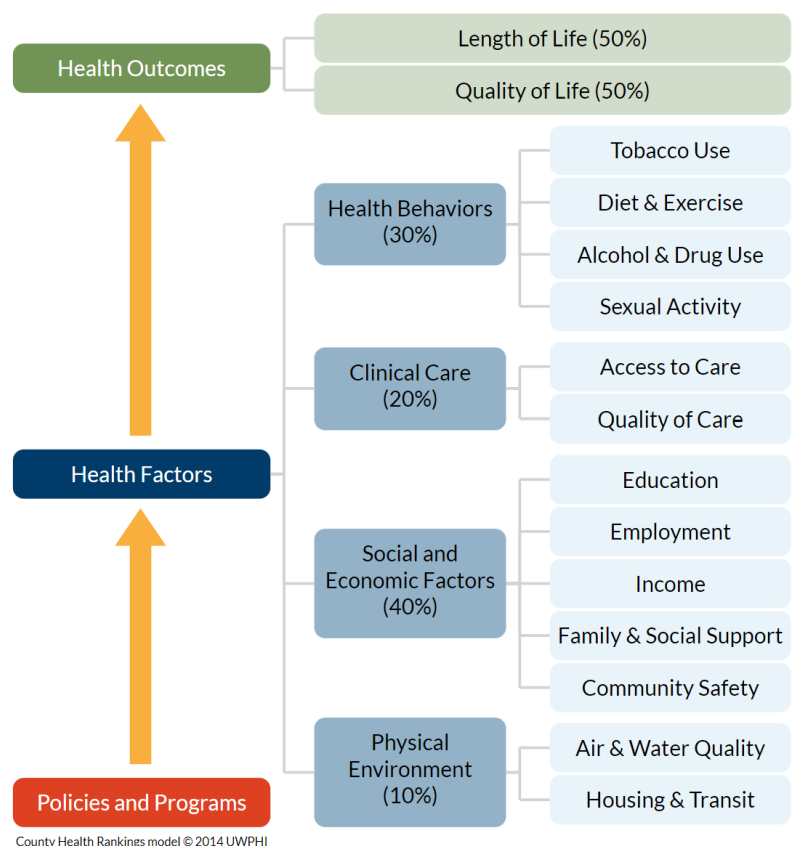


FIGURE 61

² Health Factors variables are tobacco use, diet and exercise, alcohol and drug use, sexual activity, access to care, quality of care, education, employment, income, family and social support, community safety, air and water quality, and housing and transit.

³ Health Outcomes variables are length of life (e.g., premature death, COVID-19 Age-Adjusted Mortality, life expectancy, premature Age-Adjusted Mortality, child mortality, and infant mortality). Only premature death is included in rank. Quality of life includes poor or fair health, poor physical health days, poor mental health days, low birth weight, frequent physical distress, frequent mental distress, diabetes prevalence, HIV prevalence. Only poor or fair health, poor physical health days, poor mental health days, low birth weight are included in rankings.

Quartile maps for Health Factors and Health Outcomes are displayed in Figures 62 and 63 for the counties in the state. These ranks were converted into quartiles with a 1 indicating better health factor and outcomes scores. Bollinger is in the 4th quartile (worst ranking) for health factors and 3rd quartile for health outcomes (County Health Rankings, 2022a).

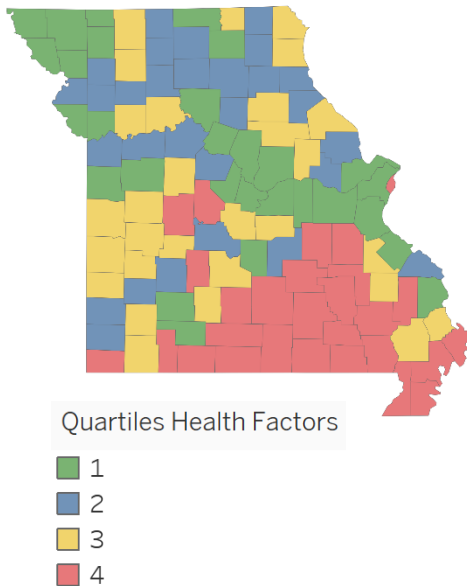


FIGURE 622

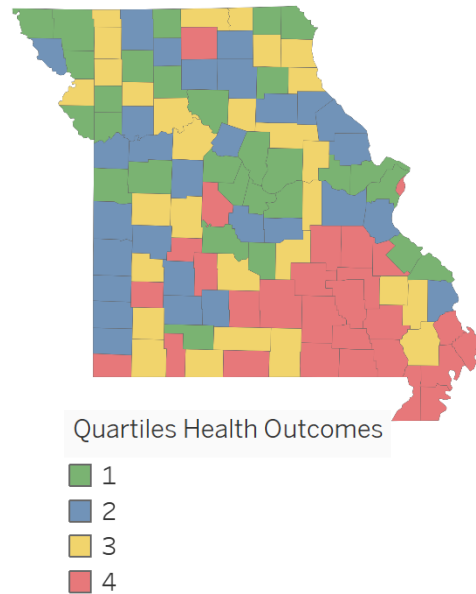


FIGURE 61

Births and Deaths

According to the Census Bureau, half of all states and nearly three quarters of all counties experiences more deaths than births in their residents between July 1, 2020 and June 30, 2021. Natural change is defined as a measure of the relationship between births and deaths.

↑ **Natural Increase = births > than deaths**

↓ **Natural Decrease = deaths > than births**

In Missouri, there were 81% of counties experiencing a natural decrease from 2011 to 2021. The 2020-2021 period was unique because it was the first time the COVID-19 pandemic affected both births and deaths (Johnson & Sabo, 2020).

In Figure 64, a state view reveals by county those areas that had a natural increase or a natural decrease. Bollinger County had a natural decrease between -150 to -1 (births minus deaths).

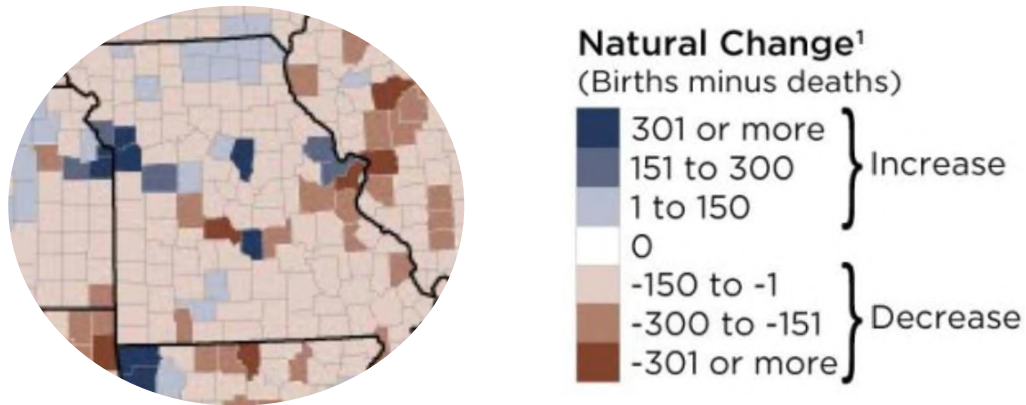


FIGURE 634

Death and Leading Causes

The 15 leading causes of death (2010 to 2020) in Missouri are represented in Figure 65 by age cohort. Heart disease is the top leading cause of death, followed by malignant neoplasms, and chronic lower respiratory diseases (Centers for Disease and Control and Prevention, 2022b).

In Table 29, the top causes of death by ICD Chapter are provided that had values for Bollinger County. Other death causes were not included because they were suppressed (less than 10) or unreliable (less than 20). The top disease groups prevalent according to crude rates per 100,000 were diseases of the circulatory system, neoplasms (i.e., cancer), respiratory system (e.g., pneumonia, bronchitis, tuberculosis), genitourinary system (e.g., renal failure), nervous system (Alzheimer's, Epilepsy, Parkinson's), external causes (accidents, intentional self-harm), and codes for special purposes (COVID-19).

Providing further detail of deaths is Table 30 with ICD Sub-Chapters for Bollinger County. The highest number of deaths was caused by neoplasms (bronchus or lung), ischemia (atherosclerotic heart or cardiovascular disease), respiratory (COPD), and nervous system (Alzheimer disease).

Top 10 Leading Causes of Death in Missouri (2010 to 2020)

	<1	1-4	5-9	10-14	15-19	20-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	All Ages	
1	Congenital Anomalies 91	Unintentional Injury 27	Unintentional Injury 12**	Unintentional Injury 18**	Unintentional Injury 115	Unintentional Injury 240	Unintentional Injury 729	Unintentional Injury 712	Heart Disease 861	Malignant Neoplasms 2,439	Malignant Neoplasms 3,897	Heart Disease 3,730	Heart Disease 5,386	Heart Disease 15,934	
2	Short Gestation 60	Homicide 10**	Congenital Anomalies Homicide	Suicide 13**	Homicide 79	Suicide 117	Homicide 252	Heart Disease 306	Malignant Neoplasms 682	Heart Disease 2,332	Heart Disease 3,186	Malignant Neoplasms 3,558	Covid-19 2,591	Malignant Neoplasms 12,907	
3	Unintentional Injury 55	Congenital Anomalies --	--	Homicide 12**	Suicide 40	Homicide 116	Suicide 216	Malignant Neoplasms 195	Unintentional Injury 537	Covid-19 701	Covid-19 1,472	Covid-19 2,079	Malignant Neoplasms 2,036	Covid-19 7,137	
4	Sids 17**	Malignant Neoplasms --	Malignant Neoplasms --	Malignant Neoplasms --	Malignant Neoplasms 12**	Heart Disease 17**	Heart Disease 92	Suicide 191	Covid-19 197	Chronic Low. Respiratory Disease 550	Chronic Low. Respiratory Disease 1,022	Chronic Low. Respiratory Disease 1,259	Alzheimer's Disease 1,804	Unintentional Injury 4,418	
5	Placenta Cord Membranes 15**	Heart Disease --	Heart Disease --	Diabetes Mellitus Heart Disease	Heart Disease --	Malignant Neoplasms --	Malignant Neoplasms 59	Homicide 158	Suicide 192	Unintentional Injury 535	Cerebrovascular 625	Cerebrovascular 967	Cerebrovascular 1,195	Chronic Low. Respiratory Disease 3,876	
6	Bacterial Sepsis 10**	Influenza & Pneumonia --	Chronic Low. Respiratory Disease Diabetes Mellitus	--	Congenital Anomalies --	Complicated Pregnancy --	Diabetes Mellitus 26	Liver Disease 94	Liver Disease 154	Diabetes Mellitus 326	Diabetes Mellitus 506	Alzheimer's Disease 843	Chronic Low. Respiratory Disease 908	Cerebrovascular 3,275	
7	Circulatory System Disease --	Cerebrovascular --	--	Benign Neoplasms Cerebrovascular	Covid-19 Chronic Low. Respiratory Disease	Covid-19 --	Liver Disease 22	Covid-19 68	Diabetes Mellitus 117	Cerebrovascular 318	Unintentional Injury 411	Diabetes Mellitus Nephritis	Unintentional Injury 594	Alzheimer's Disease 2,873	
8	Respiratory Distress Homicide	Acute Bronchitis Benign Neoplasms	--	Influenza & Pneumonia --	--	Chronic Low. Respiratory Disease --	Covid-19 20**	Diabetes Mellitus 52	Cerebrovascular 116	Liver Disease 252	Nephritis 355	486	Nephritis 529	Diabetes Mellitus 1,844	
9	--	Meningitis Septicemia	--	--	Cerebrovascular Influenza & Pneumonia	Benign Neoplasms Congenital Anomalies Nephritis	Influenza & Pneumonia 15**	Cerebrovascular 31	Chronic Low. Respiratory Disease 95	Nephritis 203	Septicemia 237	Unintentional Injury 433	Influenza & Pneumonia 451	Nephritis 1,682	
10	Atelectasis --	--	--	--	--	--	Cerebrovascular Complicated Pregnancy	Chronic Low. Respiratory Disease Septicemia	Homicide 77	Suicide 165	Liver Disease 222	Parkinson's Disease 382	Parkinson's Disease 336	Influenza & Pneumonia 1,167	
11	Maternal Pregnancy Comp. --	--	--	--	Aortic Aneurysm Nephritis	--	14**	26	Nephritis 71	Septicemia 156	Influenza & Pneumonia 214	Influenza & Pneumonia 287	Diabetes Mellitus 324	Suicide 1,125	
12	Diarrhea --	--	--	Anemias Covid-19	--	--	Septicemia 11**	Nephritis 24	Septicemia 61	Influenza & Pneumonia 138	Alzheimer's Disease 198	Septicemia 255	Hypertension 253	Septicemia 951	
13	Intrauterine Hypoxia Necrotizing Enterocolitis	--	--	Chronic Low. Respiratory Disease Complicated Pregnancy	--	--	Nephritis 10**	Complicated Pregnancy 17**	Influenza & Pneumonia 36	Hypertension 58	Parkinson's Disease 132	Hypertension 149	Nutritional Deficiencies 213	Liver Disease 900	
14	--	--	--	Congenital Anomalies Nutritional Deficiencies	--	Cerebrovascular Diabetes Mellitus	Hypertension --	Influenza & Pneumonia 16**	Hypertension 21	Homicide 56	Suicide 88	--	Pneumonitis 208	Parkinson's Disease 872	
15	Congenital Pneumonia Hematological Disorders Hernia And Intestinal Obstruction Hydrops Fetalis Maternal Toxic Substance Neonatal Hemorrhage --	--	--	Perinatal Period --	--	Influenza & Pneumonia Pneumonitis	--	Congenital Anomalies --	Hypertension 12**	Hiv 15**	Pneumonitis 47	Pneumonitis 87	Benign Neoplasms Pneumonitis 126	Septicemia 202	Homicide 803

FIGURE 645

ICD Chapter	Deaths	Crude Rate per 100,000
Diseases of the circulatory system	172	472
Neoplasms	83	228
Diseases of the respiratory system	55	151
Diseases of the genitourinary system	23	63
Diseases of the nervous system	22	60
External Causes	No values	No values
Codes for Special Purposes (COVID-19 and Vaping)	Unreliable	Unreliable

Note: From 2018 to 2020, Bollinger County had 410 deaths with a population of 36,413 (cumulative years count) with a crude death rate of 1,126 per 100,000. Codes for special purposes are uncertain etiology, terrorism-assault homicide, sequelae of terrorism, terrorism intentional suicide, SARS, codes for emergency use.

Cause of Death	Crude Rate per 100,000
Neoplasms	
Bronchus or lung	77
Ischemia	
Atherosclerotic heart disease	74
Atherosclerotic cardiovascular disease	121
Respiratory	
Chronic Obstructive Pulmonary Disease	68
Nervous	
Alzheimer disease, unspecified	10 (unreliable)

Traffic Crashes Injury and Death

An analysis of traffic crashes in the incorporated and unincorporated parts of Bollinger County from 2018 to 2020 was conducted. In Figure #, the red shading is the incorporated part of the county. The U.S. Census Bureau indicates that incorporated places have “legally prescribed relationships with governmental entities such as States, counties, and minor civil division. Incorporated places have geographic relationships with nongovernmental statistical entities such as census tracts, block numbering areas (BNAs), block groups and census blocks, census county divisions (CCDs), and urbanized areas (UAs)” (U.S. Census Bureau, n.d., p. 9-1). Missouri’s requirement for an incorporated place is 500 for a city. Figure 66 shows the incorporated places (gray shading) in Bollinger County (Arkybot, 2007).

Figure 67 and 68 provides type of population and offense rank for traffic crashes in incorporated and unincorporated Bollinger County from 2018 to 2020 (Missouri State Highway Patrol, 2022c). Note the rank is given at the end of the bar (e.g., speed for incorporated Bollinger County is a rank of 86 out of 107 ranks). The number of rankings is at the end of the population and offense. Several states may hold the same rank because of the same number of offenses.

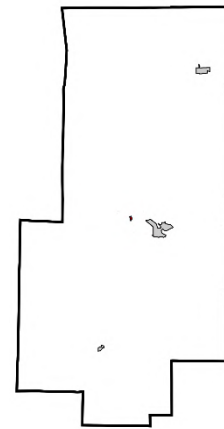


FIGURE 656

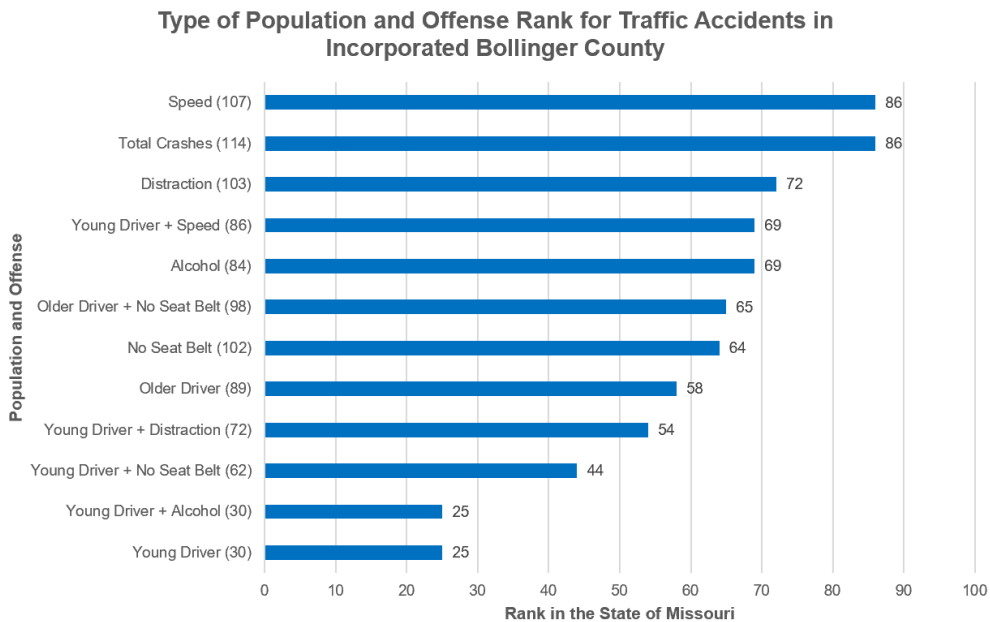


FIGURE 667

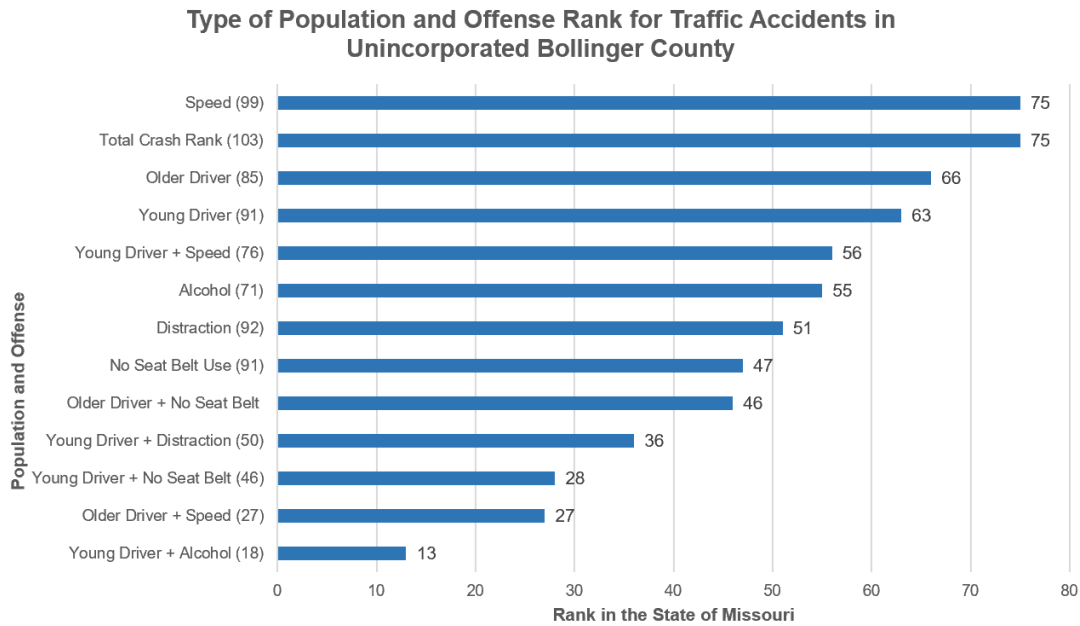


FIGURE 678

Another analysis of traffic accidents from September 23, 2021 to September 22, 2022, indicated there were a total of 53 traffic crashes in Bollinger County (Table 31). Marble Hill and the Non-City or Unincorporated are the most geographically identifiable accidents (Missouri Highway Patrol, 2022).

Table 31. Cities in Bollinger County, Missouri and Number of Traffic Accidents from September 23, 2021 to September 22, 2022

City	Frequency	Percentage
Marble Hill	10	19%
Non-City or Unincorporated	41	77%
Sedgewickville	2	4%
Total	53	100%

Several characteristics about traffic accidents in Bollinger County are as follows:

- Tuesday and Friday are the days with the highest number of accidents (Table 32).
- Fixed objects and motor vehicle in transport are the most frequent type of accident with 49% and 30% of total accidents, respectively (Table 33).
- Improper lane usage/change, none, too fast for conditions were responsible for circumstances the accidents with 28%, 17%, and 13% of the total accidents, respectively (Table 34).

- No fatalities occurred and there were no apparent injuries for 32% of the accidents. Fifty-seven percent of the accidents had an evident injury that was not disabling (Table 35).
- About 60% of the accidents occur during daylight hours (Figure 69).

The accidents by road in Bollinger County are listed in Table 36 (at this road) and Table 37 (on this road). CRD 708, West Main Street, CRD 620, 3rd Street, Industrial Park Drive, and Route WW were involved in more accidents (at this road). Missouri 51 and 34, Route H, Missouri 72, Central Avenue, Crown Street, Routes C and K were frequent locations of accidents (on this road). CST West Main Street and CST Central Avenue and CRD 708 and Route H were the top intersections for accidents (Table 38).

Table 32. Day of Week of Number of Accidents by City in Bollinger County, Missouri

City	Weekday							Total
	Fri	Mon	Sat	Sun	Thu	Tue	Wed	
Marble Hill	3	1	0	2	0	4	0	10
Sedgewickville	0	0	0	0	2	0	0	2
Unincorporated	8	4	7	4	3	11	4	41
Total	11	5	7	6	5	15	4	53

Table 33 . Frequency of Type of Accident

	Frequency	Percent
Fixed Object	26	49
Motor Vehicle in Transport	16	30
Overturn	9	17
Animal	1	2
Pedestrian	1	2

Table 34. Circumstances Surrounding the Accident

Circumstance	Frequency	Percent
Improper Lane Usage/Change	15	28
None	9	17
Too Fast for Conditions	7	13
Alcohol	4	9
Distracted/Inattentive	4	8
Wrong Side (Not Passing)	2	4
Speed Exceed Limit	2	4
Overcorrected	2	4
Speed Exceeded Limit	2	4
Failed to Yield	1	2
Unknown	1	2
Driver Fatigue/Asleep	1	2
Animal	1	2
Failed to Yield	1	2
Improper Passing	1	2
Vehicle Defects	1	2
Vision Obstructed	1	2
Total	53	100

Table 35. Number of Injuries and Fatalities		
	Frequency	Percent
None apparent	17	32
Fatal	0	0
Disabling Injury	6	11
Evident Injury (Not Disabling)	30	57
Total	53	100

**Light Conditions at Time of Accident in
Bollinger County**

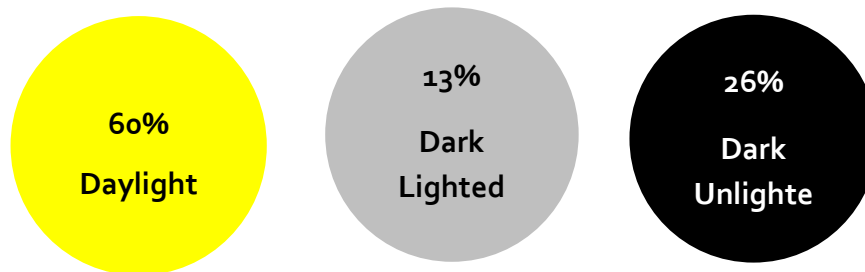


FIGURE 69

Table 36. Roads in Bollinger County Involved in at Least 3 Accidents from September 23, 2021 to September 22, 2022	
At This Road	Traffic Accidents
CRD 708	4
CST West Main Street	4
CRD 620 WJ	3
CST 3rd Street	3
CST Industrial Park Drive	3
Route WW	3

Table 37. Roads in Bollinger County Involved in at Least 3 Accidents from September 22, 2021 to September 23, 2022	
On This Road	Traffic Accidents
MO 51	12
MO 34	7
Route H	6
MO 72	5
CST Central Avenue	4
CST Crown Street	3
Route C	3
Route K	3

Table 38. Intersections in Bollinger with at least 3 Accidents from September 23, 2021 to September 22, 2022.	
Intersection of	Number of Accidents
CST West Main Street and CST Central Avenue	4
CRD 708 and Route H	4
Route WW and Route K	3
CST 3 rd Street and CST Crown Street	3
Industrial Park Drive and MO 34	3
CRD 620 WJ and Route C	3

Years of Potential Life Lost

When a death occurs, depending upon the age, a person has lost potential years to live, enjoy and flourish. In a community, if residents die prematurely, a Years of Potential Life Lost (YPLL) calculation is averaged across those who died. Typically, the age of 75 is used as a threshold for YPLL. Individually, if a 15 year old dies, the calculation would be $75 - 16.5 = 58.5$. The 15 year old is in the age cohort of 15 to 17, with an average of 16.5 years. Those who are younger have a higher YPLL (Missouri Department of Health and Senior Services, 2022).

The United States has a YPLL rate of 7,300 per 100,000. Missouri had 92,687 deaths (2018 to 2020) with a 8,860 per 100,000 YPLL rate. The Missouri minimum is 5,700 per 100,000 and the maximum is 17,200 per 100,000. Figure 70 shows the quartiles of the state and specifically Bollinger County where YPLL is 8,469 years per 100,000. The higher the quartile, the more years of potential life lost per 100,000. Bollinger is in the 2nd Quartile (County Health Rankings, 2022a).

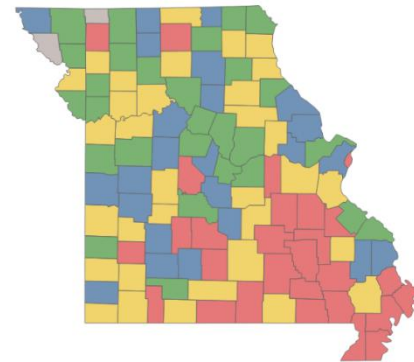
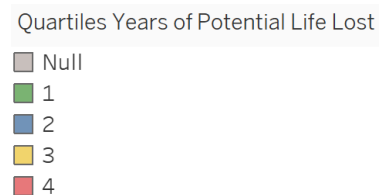


FIGURE 7068



Preventable Hospital Stays

Hospital stays can be prevented with disease management, seeking treatment for symptoms early in a primary care setting, and effective management by primary care providers in outpatient settings. Hospital stays are costly, and stays are an indicator of health system efficiency. Preventable conditions are considered diabetes with short or long-term complications, uncontrolled diabetes without complications, diabetes with lower-extremity amputation, chronic obstructive pulmonary disease, asthma, hypertension, heart failure, dehydration, bacterial pneumonia, or urinary tract infection (Moy, 2013). This value is based on Medicare beneficiaries ages 18 years or older enrolled in Part A (U.S. Centers for Medicaid and Medicare Services, 2022; County Health Rankings, 2022a). The range in Missouri is 1,333 to 8,358 per 100,000 with an overall rate of 4,155 per 100,000. Preventable hospitalization rate (2019) was converted into quartiles. Bollinger County has an age-adjusted rate of 3,617 per 100,000 placing it in Quartile 2 (Figure 71).

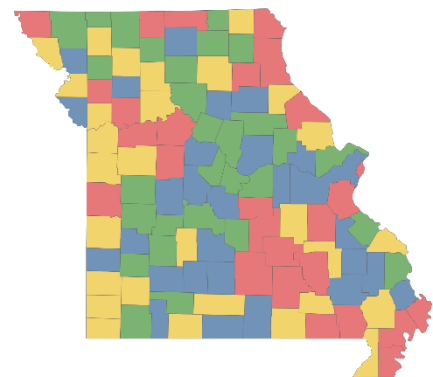
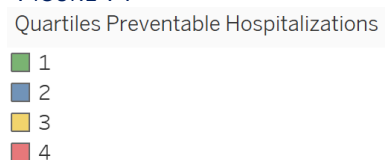


FIGURE 71



Communicable Disease

Measures within this category include diseases which are usually transmitted through person-to-person contact or shared use of contaminated instruments / materials. Many of these diseases can be prevented through a high level of vaccine coverage of vulnerable populations, or using protective measures, such as condoms for the prevention of sexually transmitted infections.

Chlamydia Rates

Chlamydia can occur from unsafe sex and has many other poor health outcomes. Medical costs for managing chlamydia are very expensive and tends to disproportionately affect women poor communities, such as minority women. Missouri has a chlamydia rate of 561 per 100,000 (2019). Bollinger County has a chlamydia rate of 223 per 100,000, making it lower than the state value. Figure 72 shows the chlamydia rate quartile for Bollinger County has a Quartile 2 with data from the National Center for HIV/AIDS, Viral Hepatitis, STD Prevention, and TB (2022) and County Health Rankings, 2022a).

Human Immunodeficiency Virus (HIV)

The measurement of HIV in a community can indicate unsafe drug use, unsafe sexuality activity, lack of treatment, and prophylaxis availability. HIV rates are defined as the number of people aged 13 years and older living with a diagnosis of human immunodeficiency virus (HIV) infection per 100,000 population (2019). Counties with up to four cases are termed missing data (white added shaded counties) and are not included. The state rate for HIV is 248 per 100,000. Bollinger County has an HIV rate of 145 per 100,000 (Figure 73) and in the 3rd quartile (National Center for HIV/AIDS, Viral Hepatitis, STD Prevention, and TB, 2022; County Health Rankings, 2022a).



FIGURE 69

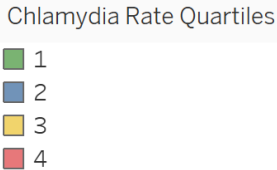
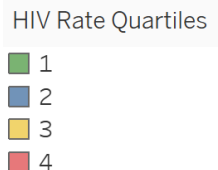


FIGURE 70



COVID-19

COVID-19 (coronavirus disease 2019) is caused by a virus named SARS-CoV-2. It was discovered in December 2019 in Wuhan, China. It is contagious and spreads quickly. The symptoms are mostly respiratory and feels much like a cold or pneumonia. On January 20, 2020, the first laboratory confirmed case of the virus was found in Washington State. Globally, as of September 22, 2022 there have been (World Health Organization, 2022):

- 610,866,075 confirmed cases of COVID-19
- 6,510,139 deaths
- 12,640,866,343 vaccine doses have been administered (as of September 20, 2022)

Figure 74 provides the cumulative cases and deaths since January 22, 2020 for Bollinger County (Centers for Disease Control and Prevention, 2022a).

Bollinger All Time Cases and Deaths

(since January 22, 2020)

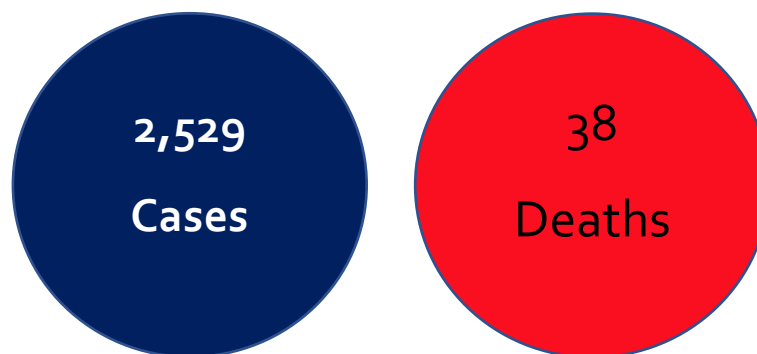


FIGURE 71

There were no confirmed cases in Bollinger County from January 22, 2020 until March 20, 2020. On March 20, 2020, the county tested its first case. Figure 75 illustrates the timeline of COVID-19 confirmed cases until August 26, 2022 with 7-day rolling averages of cases. A graph is not provided for Bollinger County related to COVID deaths because values per date were either 0 or suppressed (meaning less than 10 cases).

In Figure 76, the percentage of adult inpatient beds and adult ICU beds utilized were placed on a timeline. At the peak, 61% of ICD beds were utilized, whereas over 19% of inpatient beds were utilized by confirmed COVID-19 cases (Centers for Disease Control and Prevention, 2022c).

In Figure 77 stacked bar charts, the community levels of transmission for COVID-19 are shown for 2020, 2021, and 2022. Seven-day rolling averages were obtained through the

year and the level of transmission were noted. For each year, the number of times the community was in low, high, moderate, and substantial transmission is noted. A significant number of 7-day intervals were spent in high transmission (yellow shading) for all 3 years (Centers for Disease Control and Prevention, 2022c).

Figure 78 illustrates the uptake of vaccinations with the county population by age cohort and vaccination status. The age cohort of more than 65 years are more vaccinated with at least one dose, fully vaccinated, and first booster. (Centers for Disease Control, 2022c).

Figure 79 illustrates the 7-day rolling case count (ending September 22, 2022) across the state. Bollinger is in Quartile 3 with a case count 165 per 100,000. The 7-day rolling death counts for all counties in Missouri were either 0 or suppressed, meaning counts were less than 10 deaths for those 7 days.

7-Day Rolling Average of COVID-19 Cases for Bollinger County, Missouri

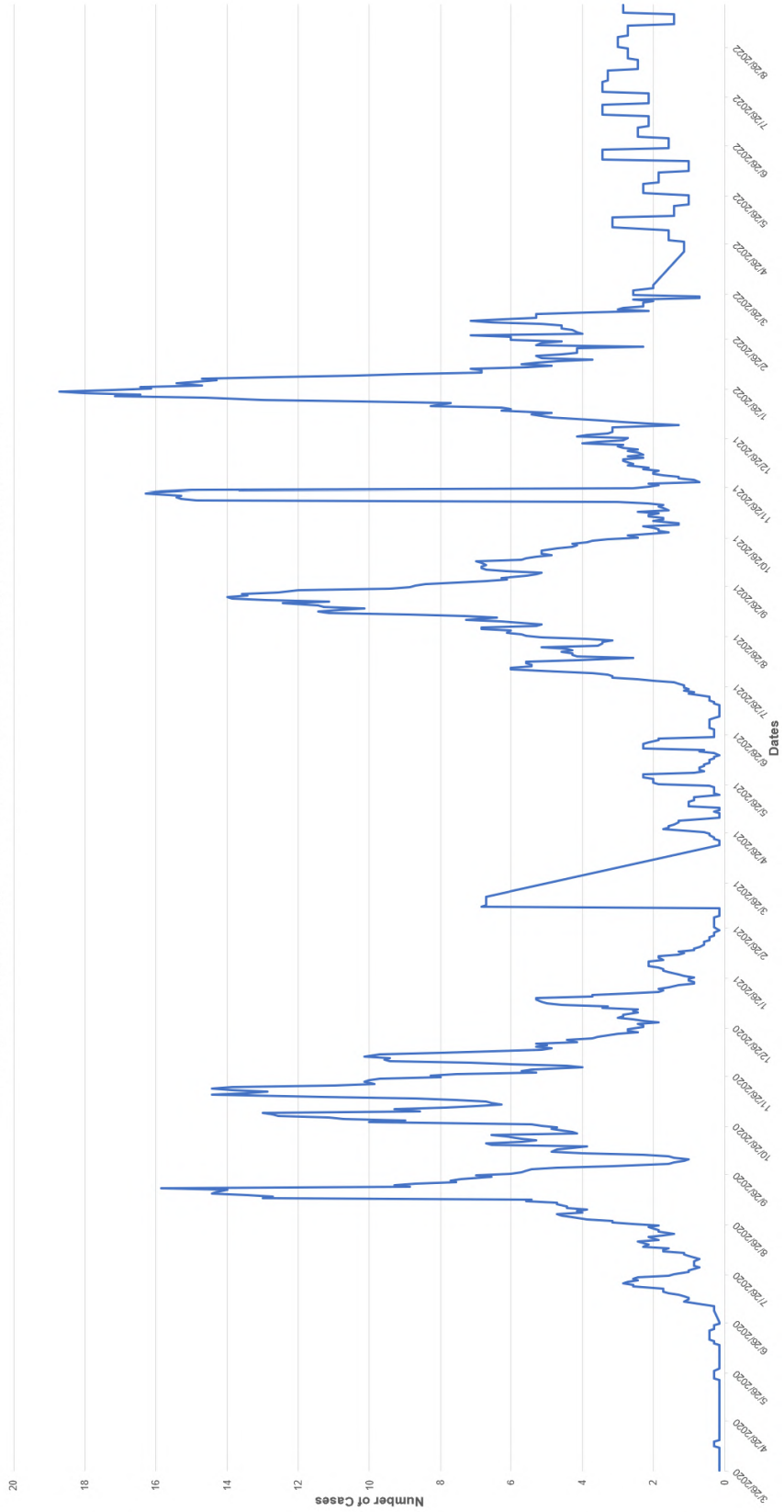


FIGURE 725

Percent Staffed Inpatient Beds and ICU Beds with Confirmed COVID-19 Cases
(7-Day Rolling Average)

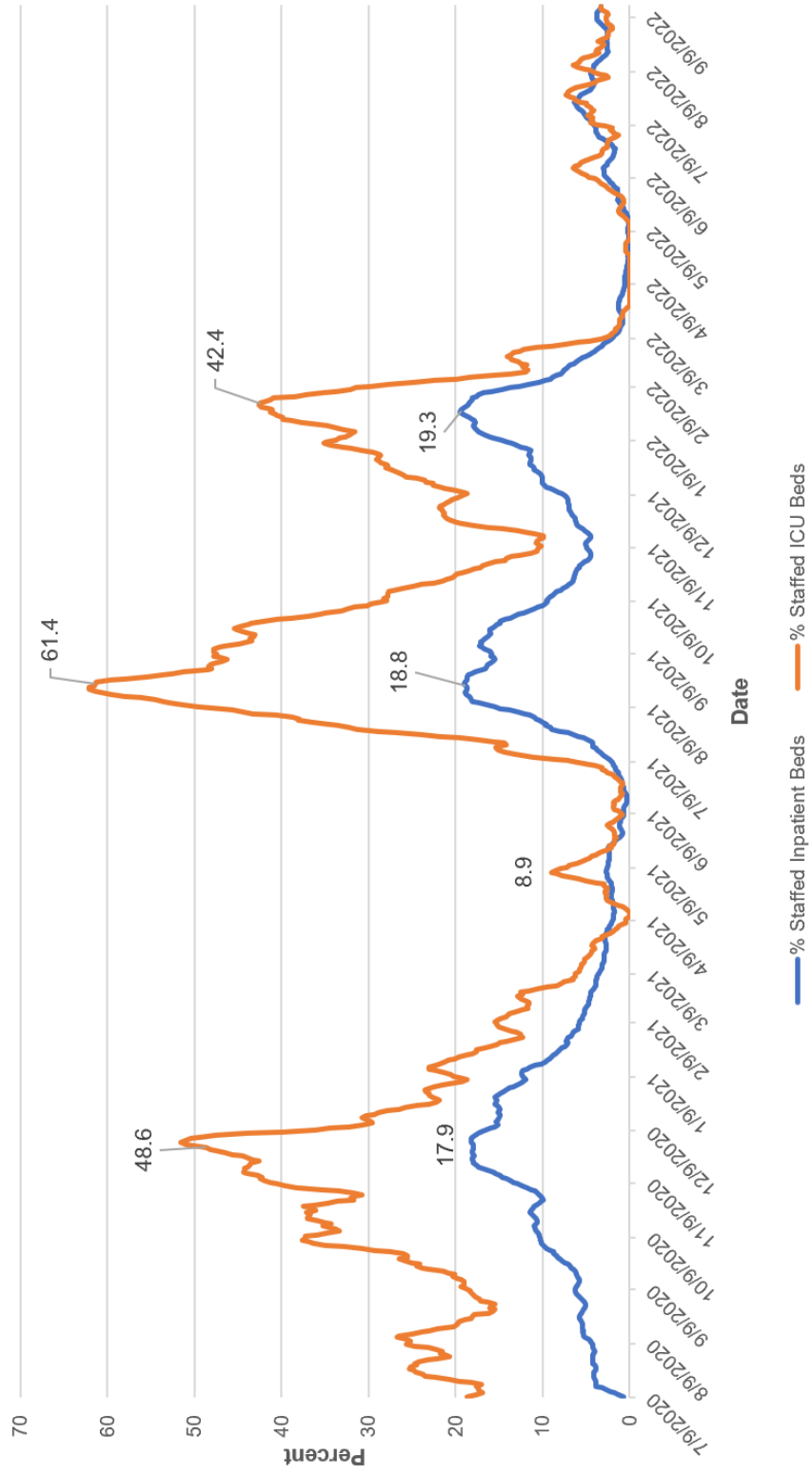


FIGURE 736

COVID-19 Community Levels of Transmission in Bollinger County, Missouri April 7, 2020 to September 21, 2022

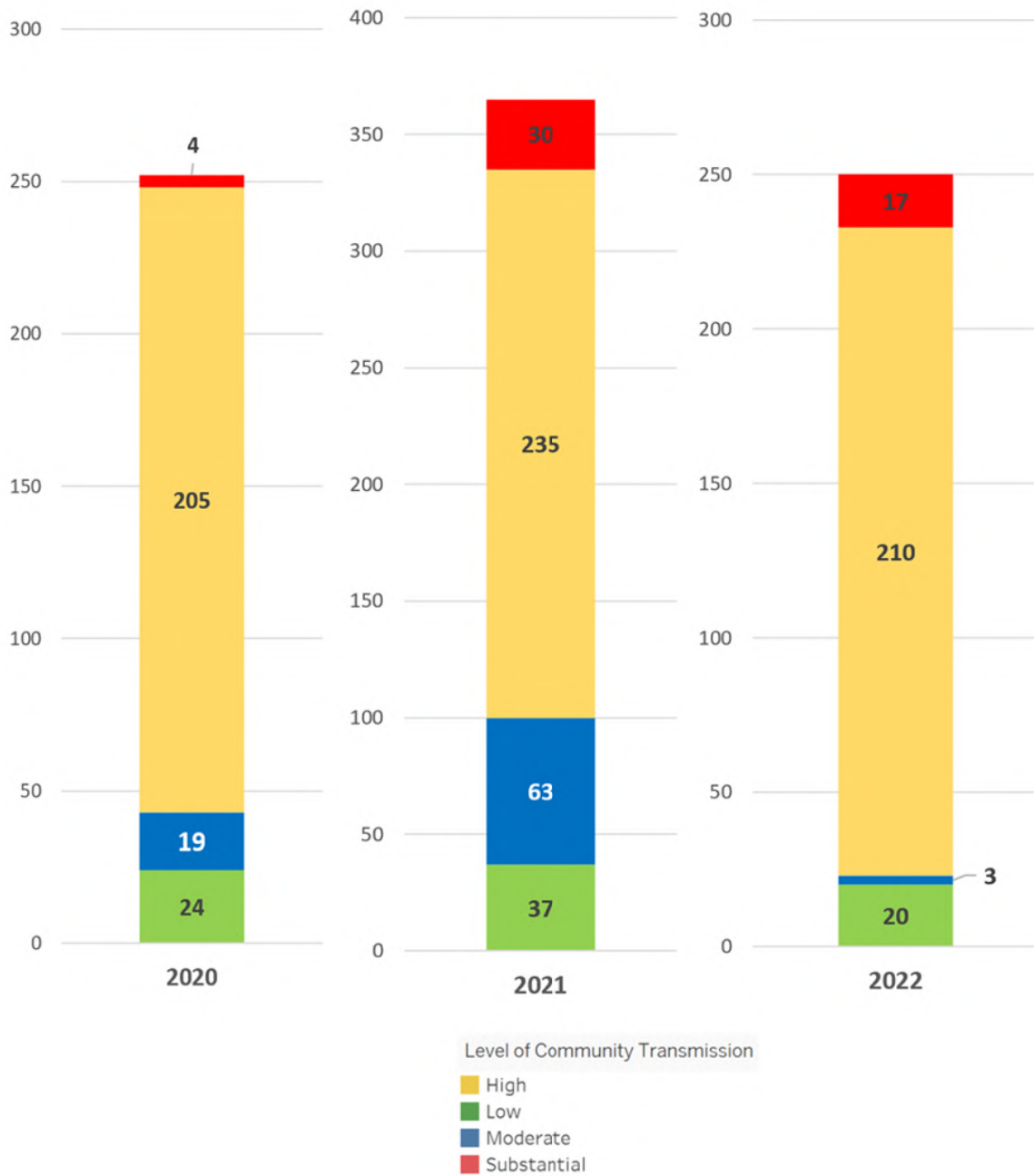


FIGURE 747

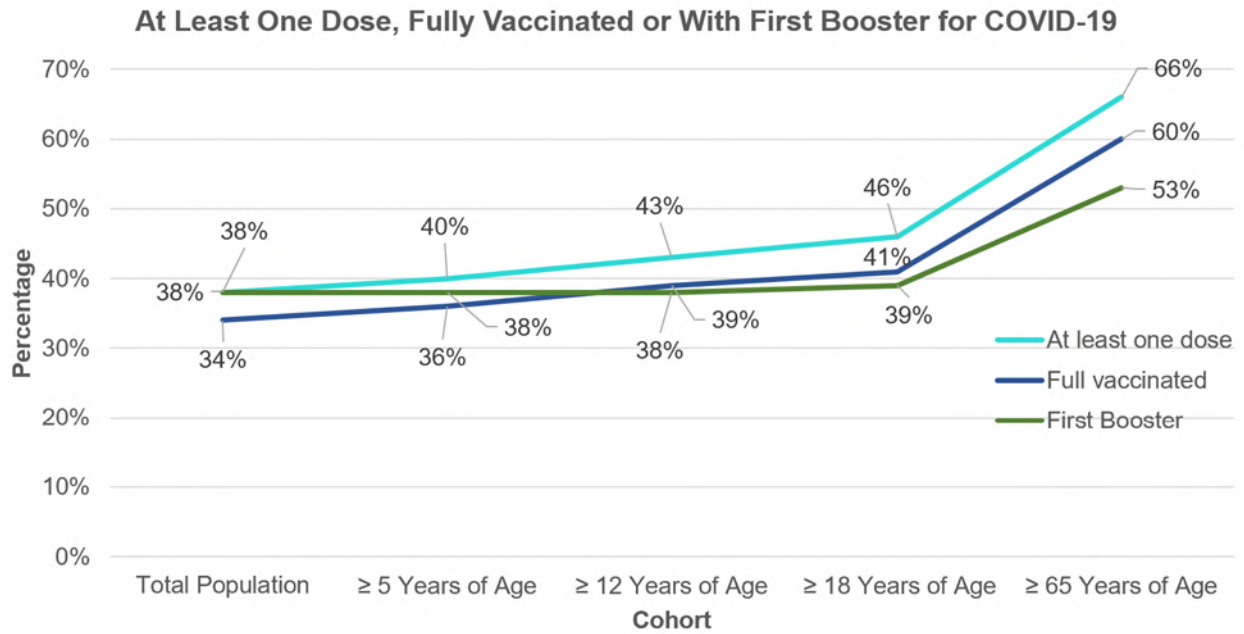


FIGURE 758

Figure #. 7-Day COVID-19 Case Rate per 100,000 Population

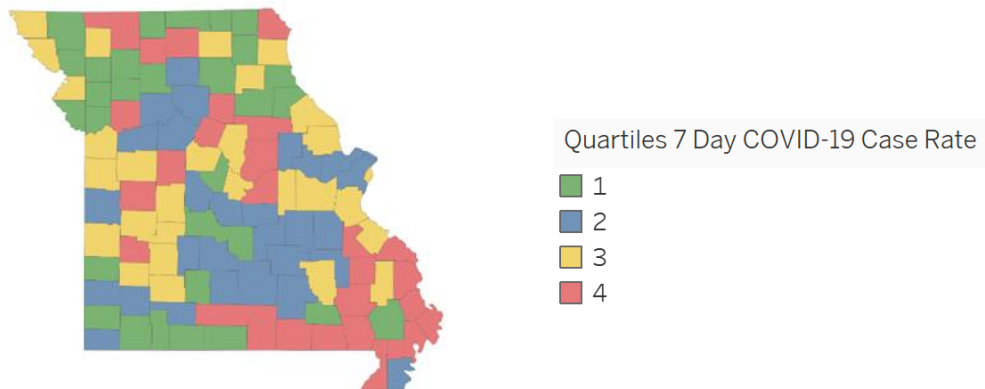


FIGURE 79

Access

Food Environment

Access to healthy foods weighs heavily on overall health. The food environment index considers proximity to healthy foods and income. The Food Environment Index gives equal weight to:

- percentage of the population that is low income (< than 200% of the federal poverty threshold for family size) and does not live close to a grocery store (< 10 miles in rural areas; < 1 mile for nonrural areas).
- percentage of population that did not have access to a reliable source of food in the past year.

16%
Percent of people are food insecure in Bollinger County or 1,890



Each person in the graph represents 1,000 citizens in the county with food insecurity.

FIGURE 760

When children and families do not have enough to eat, this results in many adverse physical, mental, and social issues. Drivers of food insecurity are access to stores, employment, and poverty. Bollinger County has a population of 10,567. As shown in Figure 80, 16% (N = 1,890) of Bollinger county residents are food insecure (Gundersen et al., 2021).

Figure 82 shows the entire county. The green areas are portions of Madison and Wayne counties. According to the data, there are no areas in the county that are Low Income and Low Access (LI/LA) to food sources at 1 and 10 miles, .5 and 10 miles, and 1 and 20 miles and no areas with more than 100 units with no access to transportation (U.S. Department of Agriculture, 2022; U.S. Census Bureau, 2022g). Table 39 proves food accessibility, poverty, and income by census tract. Figure 83 shows a census tract with concern for food insecurity.

The index ranges from a scale of 0 (worst) to 10 (best). Missouri counties range from 3.9 (Schuyler County) to 8.8 (St. Charles). Bollinger County's Food Environment Index is 6.7 (County Health Rankings, 2022). The U.S. Department of Agriculture defines food security as a "means to access by all people at all times to enough food for an active, healthy life" (U.S. Department of Agriculture, 2022c, para. 1).

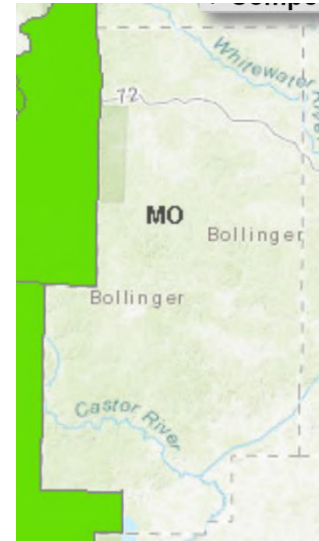


FIGURE 771

Table 39. Food Accessibility, Poverty, Income by Census Tract

Tract	Urban	Tract Population	% Living below FPL	Low Income Tract	Median Family Income	LI/LA 1 - 10 miles	LI/LA .5 - 10	LI/LA 1 - 20	LI/LA no vehicle or at 20	> 100 households no vehicle and .5
9501	No	4691	16	No	57697	No	No	No	No	No
9502	No	4609	20	Yes	43839	No	No	No	No	No
9503	No	3063	15	No	57438	No	No	No	No	No

Note: LI/LA = Low Income, Low Access; .5 – 10, 1 – 10, 1- 20 are mile ranges to food access.

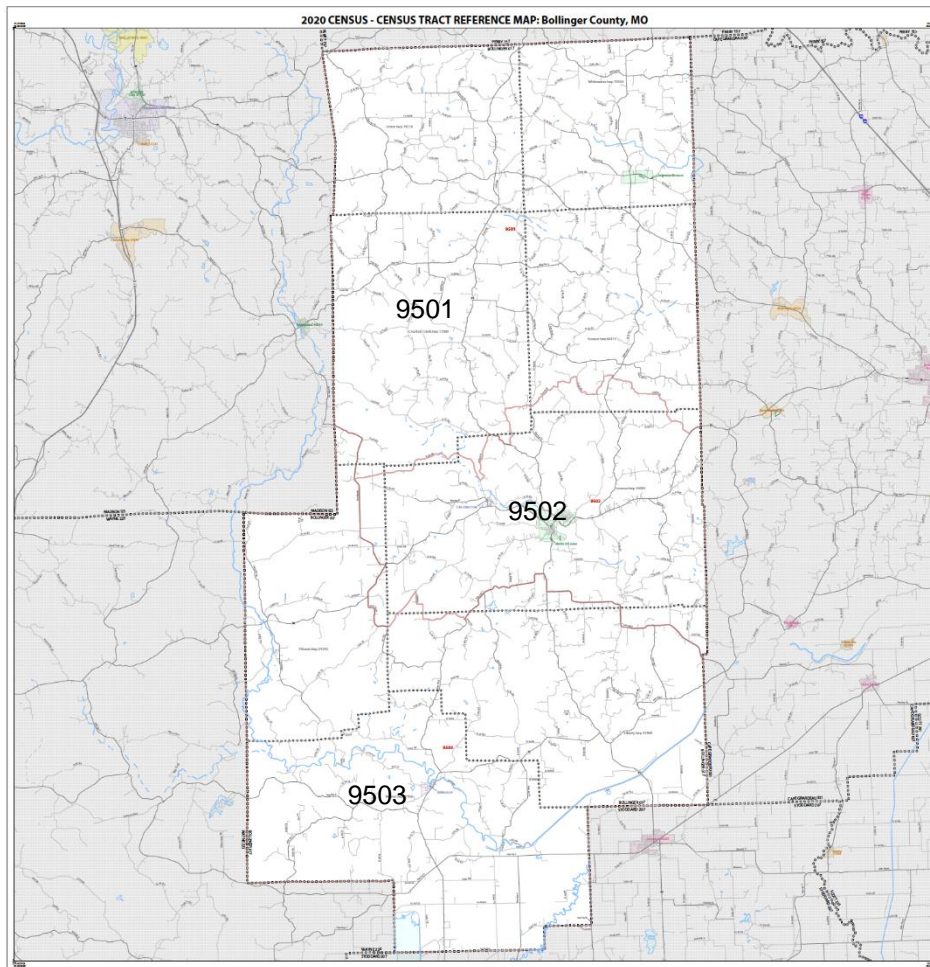


FIGURE 82

Alcohol Establishments

According to the Missouri Active Alcohol License Data files (State of Missouri, 2022), there are 18 active establishments (Figure 83) in Bollinger County, Missouri (as of September 9, 2022). Table 40 provides the number of people per establishment, that is, there are 17 people per establishment in Glen Allen (State of Missouri, 2022).

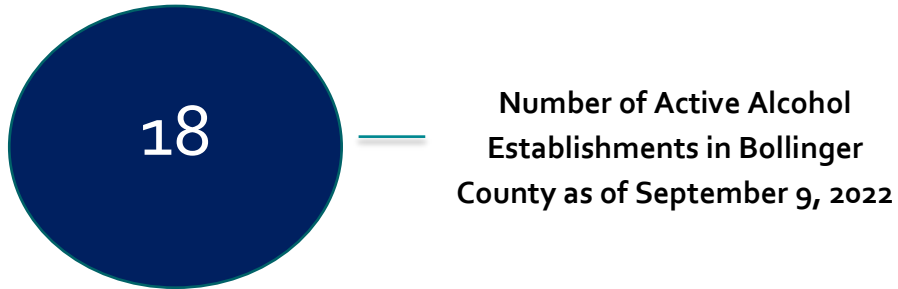


FIGURE 83

Table 40. Comparison of Number of Active Alcohol Establishments by City in Bollinger County, Missouri and Rate per 1,000

City	Number of Establishments	Population	Number of People per Establishment
Glen Allen	3	51	17
Leopold	2	65	33
Marble Hill	8	1,388	174
Patton	1	1642	1642
Puxico	1	881	881
Sedgewickville	1	191	191
Zalma	2	73	3

Income Inequality/Income Ratio

Income inequality is defined as the ratio of household income at the 80th percentile to income at the 20th percentile. The Pew Research Center (2022) indicates that economic inequality matters because it diminishes opportunity and mobility. They cite technological change, globalization, decline of unions, and the eroding value of the minimum wage as reasons for income inequity. The income ratio is 4.9 in the United States, 4.5 in Missouri. The minimum for Missouri is 3.5 and the maximum is 6.5. In Figure 84, Bollinger’s Income Ratio is 4.4 (higher ratio indicator means greater disparity in the top and

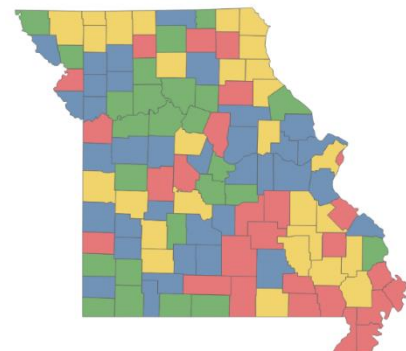
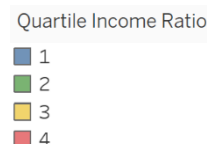


FIGURE 784



bottom ends of the income range) and is in Quartile 3 (County Health Rankings, 2022a).

Child Care Availability and Costs

Having social support with child care and acceptable childcare costs is beneficial for the entire community. Table 41 identifies the number of facilities in Bollinger County as of September 21, 2022 (Missouri Department of Elementary and Secondary Education, 2022). The estimated population of children less than 5 years of age is 617 (U.S. Census Bureau, 2022c). The percentage for the county is 19% of income needed for childcare with a range in Missouri of 11% to 33%. The county is in the 3rd quartile for the percentage of income required for childcare expenses (or known as the childcare cost burden). The higher the quartile and percentage the more income needed to pay for childcare.

Type	Number
Family Homes	2
Subsidy Summer Camps	0
Group Home	1
Subsidy School Based Care	0
Child Care Center	1
Registered Family Home	0
License Exempt Program	2
Total	6

Internet Access

Broadband Access is the percentage of the population with fixed access to the Internet at speeds of 25 megabits per second (mbps) download and 3 mbps upload or higher (Federal Communications Commission, 2022). Hudson and Lancaster (2018) state that:

broadband access is required to efficiently support employment opportunities, workforce development, education, health care (telehealth), and access to/enrollment in state and federal programs (e.g. SNAP). Broadband access can foster social connectedness, particularly among older populations, reducing the burden of social isolation, strengthening community support, and decreasing loneliness (County Health Rankings, 2022a; Hudson, 2018).

Missouri has 83% broadband access with a range of 57 to 92% (2016 to 2020). Figure 85 shows the access to broadband across the state. Bollinger County has 74% with

access to broadband, which places it in the 2nd quartile. The lower quartiles indicates less access (County Health Rankings, 2022a). Table 42 shows the characteristics of internet access in the county (National Telecommunications and Information Administration, 2022).

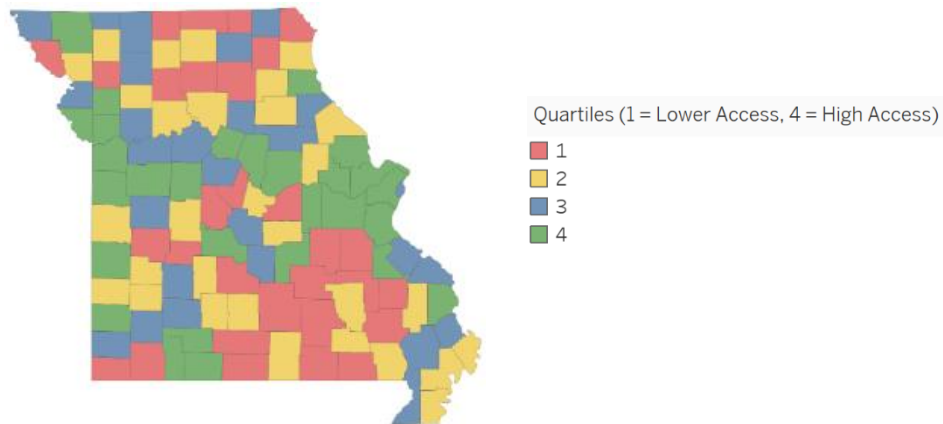


FIGURE 795

Table 42. Characteristics of Internet Access	
Characteristics	Value
Population (FCC 2019 Estimate):	12,133
ACS Percentage of Households without Internet Access:	27,30%
ACS Percentage of Households without Computer, Smartphone or Tablet:	19.30%
M-Lab Speed Test Median (Mbps):	9.17/2.28
Ookla Speedtest Median (Mbps):	9.81/2.60
Microsoft Percentage of Downloads Completed Over 25 Mbps or Higher:	3%

Access to Various Services

Neighborhood is measured by metrics and policies focused on proximity to key destinations, safety, and supporting mixed-use development. Table 43 provides the accessibility to neighborhood livability. Proximity to the metric is provided for each major city in Bollinger County. Higher scores are better (American Association of Retired Persons, 2022).

Table 43. Neighborhood Livability Characteristics for Cities in Bollinger County, Missouri					
Proximity to Metric	Marble Hill	Sedgewickville	Zalma	Leopold	Patton
Neighborhood Overall Livability	34	25	21	26	27
Number of stores within .5 miles	0	0	0	0	0
Number of parks within .5 miles	0	0	0	0	0
Number of libraries within .5 mile (0 to 1)	0	0	0	0	0
Number of jobs within a 45-minute transit commute	0	0	0	0	0
Number of jobs within a 45-minute auto commute	2,176	1,735	231	1,477	1,677
Diversity of destinations within 1 mile scored 0 to 1	.57	0	0	0	0

Attachment A			
Data Sources for CHA Health Indicators			
United States Census Bureau	National Institute on Alcohol Abuse and Alcoholism	Fatal Analysis Reporting System (FARS)	Human Rights Campaign
Opportunity index by Opportunity Nation	National Alliance for Model State Drug Laws	Missouri Highway Patrol Crash Data	Campaign for Tobacco Free Kids
Bureau of labor statistics	Robert Wood Johnson Foundation Prescription Drug Abuse Scores by State	Local School System (homeless census, free/reduce lunch, school surveys)	Community Commons
County Health Rankings	Centers for Disease Control and Prevention WONDER Database Detailed Mortality Tables	State Prescription Drug Monitoring Program	Behavioral Risk Factor Surveillance System
U.S. Department of Justice	Centers for Disease Control and Prevention WISQARS	Synar Amendment Reports (tobacco data)	University of Missouri, Center of Applied Research and Environmental Systems
Health Resources and Services Administration	Missouri Department of Mental Health Missouri's Substance Use and Mental Health	STOP Act State Reports (alcohol data)	Missouri Department of Health & Senior Services, Tobacco Control
Missouri Hospital Association	Missouri State Highway Patrol Crime Data	Annie E. Case Foundation Kids Count	National Center for Chronic Disease Prevention and Health Promotion.
Missouri Department of Health and Senior Services	Federal Bureau Investigation	National Child Traumatic Stress Network	Missouri Department of Health and Senior Services. MICA Datasets
American Association for Retired Persons Livability Index	Missouri Information for Community Assessment (MICA)	America's Health Rankings for Adverse Childhood Experiences (ACES)	State Epidemiological Workgroup Student Surveys
National Consumer Law Center		State of the Nation's Cities Database	Google searches (alcohol outlets)
Corporation for Enterprise Development	Missouri Department of Education	National School Climate Center	Local School Districts
World Health Organization Global Network for Age-Friendly Cities and Communities	Centers for Disease Control County Level Teen Pregnancy Data	Diversity Data Kids	Local Sherriff's Department
Smart Growth America	National Vital Statistics System (NVSS)	Health Landscape	Local Police Departments
National Conference of State Legislatures	Healthcare Cost and Utilization Project (HCUP)	MyEnvironment	Local Hospitals
Air Quality Data for the CDC national Environmental Public Health Tracking Network	National Association of Community Health Centers	Federal Emergency Management Administration	Medical Examiner
Treatment Episode Data Set (TEDS)	Emergency Room Data (DAWN)	Americans for Nonsmokers' Rights Foundation	

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