Missouri Opioid Overdose and Bloodborne Infection Vulnerability Assessments

2022

Prepared by
Missouri Department of Health and Senior Services,
Division of Community and Public Health

Including:
Bureau of Health Care Analysis and Data Dissemination
Bureau of HIV, STD, and Hepatitis
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MISSOURI DEPARTMENT OF HEALTH & SENIOR SERVICES

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This report is accessible via the internet at:

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Executive Summary

The Missouri Department of Health and Senior Services, Division of Community and Public Health, with funding from the Centers for Disease Control and Prevention's (CDC's) Overdose Data to Action grant, updated county-level vulnerability assessments for 1) opioid overdoses and 2) bloodborne infections. In 2019, an internal workgroup composed of staff from multiple units, in consultation with CDC staff, developed a methodology and selected indicators within two categories – individual outcomes and community factors. The 2022 update utilized the same methodology but incorporated more recent data. The 23 lowest ranked counties were considered to be at greatest risk for each outcome. *It is important to note that a ranking outside of the 23 more vulnerable counties does not indicate that a county is not at risk for that outcome.* There was considerable overlap in the counties identified as more vulnerable by each assessment, which are listed in bold font in the tables below. Data for all counties are included in the Appendices so that the results of these assessments may be used statewide rather than in only the more vulnerable counties. Stakeholder meetings were held to gather community-level feedback on the assessments.

More Vulnerable to Opioid Overdoses 2022	More Vulnerable to Bloodborne Infections 2022
Benton	**Benton[¥]**
Buchanan[¥]	**Buchanan[¥]**
Butler	**Butler**
Crawford*	Callaway[¥]
Dent	**Crawford***
Dunklin	**Dent**
Howell[¥]	**Dunklin**
Iron*	Greene
Madison*[¥]	**Howell**
Mississippi	**Iron***
New Madrid	Laclede[¥]
Pemiscot[¥]	**Mississippi**
Phelps	**Phelps**
Ripley*	Randolph[¥]
Scott[¥]	**Ripley***
St. Francois*	**St. Francois***
St. Louis City	**St. Louis City**
Stoddard[¥]	Stone
Taney	**Taney**
Texas[¥]	**Texas[¥]**
Washington*	**Washington***
Wayne*	**Wayne***
Wright*[¥]	**Wright***

*This county was also identified as vulnerable to rapid dissemination of HIV/hepatitis C virus (HCV) infection among persons who inject drugs (PWID) in a National Vulnerability Assessment prepared by the CDC.[1]

[¥]This county was not ranked as more vulnerable in this category by the 2020 Missouri assessment.

Abbreviations Used in This Report

ACES = Adverse Childhood Experiences

ADHD = Attention-Deficit/Hyperactivity Disorder

AIDS = Acquired Immunodeficiency Syndrome (stage 4 HIV)

BEVS = Bureau of Epidemiology and Vital Statistics

BHCADD = Bureau of Health Care Analysis and Data Dissemination

BHSH = Bureau of HIV, STD, and Hepatitis

BRDI = Bureau of Reportable Disease Informatics

CDC = Centers for Disease Control and Prevention

DCC = Disaster and Community Crisis Center at the University of Missouri - Columbia

DHSS = Missouri Department of Health and Senior Services

eHARS = enhanced HIV/AIDS Reporting System

ER = Emergency Room

ESSENCE = Electronic Syndromic Surveillance for the Early Notification of Community-based Epidemics

HBV = Hepatitis B Virus

HCV = Hepatitis C Virus

HIV = Human Immunodeficiency Virus

IDU = Injection Drug Use

LPHA = Local Public Health Agency

NAS = Neonatal Abstinence Syndrome

NCHHSTP = National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention

NIBRS = National Incident-Based Reporting System

PAS = Patient Abstract System

PWID = Persons Who Inject Drugs

STD = Sexually Transmitted Disease

SUDT = Substance Use Disorder Treatment

TB = Tuberculosis

WebSurv = Missouri's Communicable Disease Registry

Introduction

Opioid misuse is a growing problem in Missouri, as well as throughout the nation. In 2020, drug overdoses were the #1 leading cause of death among adults age 18-44, and over 70% of these overdoses involved opioids.[2] From 2016 to 2021, Missouri resident opioid overdose deaths increased by 74% from 908 death to 1,581 deaths. The number of heroin deaths is decreasing, while the number of synthetic opioid overdose deaths is increasing. In 2016, heroin accounted for 42% of all opioid-related deaths, but that figure decreased to 6% in 2021. Synthetic opioids accounted for 48% of all opioid-related deaths in 2016 and this increased to 91% by 2021. From 2016 to 2020, opioid-related emergency room (ER) visits showed a 26% increase (from 3,576 to 4,519). However Missouri resident opioid-related inpatient hospitalizations decreased by 23%, from 2,545 visits to 1,964 visits, in the same time period.[3]

Opioid misuse via injection is a risk factor for several bloodborne conditions, including human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS), hepatitis B virus (HBV), and hepatitis C virus (HCV).[4] In fact, intravenous drug use is the leading risk factor for hepatitis C.[5,6] Outbreaks of bloodborne diseases due to needle sharing related to opioid misuse and misuse of other drugs have been reported in other states.[7] In addition, "since 2017, the [United States] has experienced outbreaks of hepatitis A among persons experiencing homelessness and persons who use injection and non-injection drugs. These prolonged outbreaks have resulted in 44,209 infections, including 27,018 (61%) hospitalizations and 420 deaths as of April 15, 2022."[8] Missouri has also seen a rise in neonatal abstinence syndrome (NAS) hospital discharges as the opioid epidemic has grown. From 2016 to 2020, the number of Missouri NAS hospital discharges increased by 25% (from 567 discharges to 709 discharges).[9]

DHSS, local public health agencies (LPHAs) and partners are responding to the epidemic, but these organizations have limited resources. The ability to accurately describe and measure the epidemic is critical for utilizing those available resources and providing effective responses. The *County-level Vulnerability Assessment for Rapid Dissemination of HIV or HCV Infections Among Persons Who Inject Drugs, United States* is a helpful resource.[10] (For the remainder of this report, this document will be referred to as the "National Vulnerability Assessment.") This assessment identified 13 Missouri counties as vulnerable to bloodborne infection outbreaks among people who inject drugs (PWID): Bates, Cedar, Crawford, Hickory, Iron, Madison, Ozark, Reynolds, Ripley, St. Francois, Washington, Wayne, and Wright. All of these counties are relatively rural. Yet multiple types of data (mortality, inpatient hospitalization, ER visit, communicable disease, etc.) indicate that other areas of the state are impacted as well.

Please note: Throughout this document, graphics specific to the opioid overdose assessment are presented in orange, while graphics specific to the bloodborne infection assessment are presented in blue. Graphics representing data utilized in both assessments are presented in yellow.

Background and Purpose of the Missouri Vulnerability Assessments Project

During the summer of 2018, the CDC utilized the Cooperative Agreement for Emergency Response: Public Health Crisis Response – CDC-RFA-TP18-1802 mechanism to award Opioid Crisis Supplemental Funding to jurisdictions impacted by the opioid overdose epidemic. On August 31, 2018, Missouri was one of the states notified to receive one year of funding under this award for a project from the CDC's National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (NCHHSTP). This project required awardees to develop and disseminate jurisdiction-level vulnerability assessments that identify subregional (e.g., county, census tract) areas at high risk for i) opioid overdoses and ii) bloodborne infections (i.e., HIV, hepatitis C, hepatitis B) associated with nonsterile drug injection. Missouri utilized this opportunity to create a state-specific vulnerability assessment methodology.

The overall purpose of the project was that awardees use the findings from the assessments to develop plans that strategically allocate prevention and intervention services and distribute findings to key stakeholders in formats that support action. This was intended to allow the use of the assessments' findings to target services that would maximally reduce risk of overdoses and risk of bloodborne infection spread through nonsterile drug injection.[11]

Development of Missouri's Vulnerability Assessments and the 2022 Update

In 2019, the NCHHSTP portion of Missouri's opioid crisis funding was assigned to the Bureau of Reportable Disease Informatics (BRDI). Upon receipt of the award, BRDI assembled an internal working group of stakeholders from DHSS. This workgroup included representatives from BRDI; the Bureau of HIV, STD, and Hepatitis (BHSH); the Bureau of Health Care Analysis and Data Dissemination (BHCADD); the Bureau of Epidemiology and Vital Statistics (BEVS); and the Section for Disease Prevention. This workgroup met frequently, often weekly, throughout the project period to select indicators, develop a state-specific methodology, and refine the vulnerability assessments based on additional feedback received.

Staff from these units were selected to participate based on their knowledge and experience related to the opioid epidemic, bloodborne outbreaks and related data. BHCADD manages Missouri's Enhanced State Opioid Overdose Surveillance grant and staff were able to draw upon knowledge of the opioid epidemic they had gained from that project. This unit also manages the death portion of Missouri's vital statistics program and hospital/ER data through the Patient Abstract System (PAS). In 2019, BRDI managed Missouri's communicable disease registry (WebSurv), the enhanced HIV/AIDS Reporting System (eHARS), and the state's syndromic surveillance system (ESSENCE – Electronic Syndromic Surveillance for the Early Notification of Community-based Epidemics). BRDI created annual epidemiologic profiles of HIV and viral hepatitis. Furthermore, BHCADD, BEVS and BRDI staff included several research analysts and epidemiology specialists with experience performing data analysis, creating maps and writing reports. These staff were also familiar with external resources such as the U.S. Census Bureau website. BHSH provided prevention, education, and access to care information for individuals impacted by HIV/AIDS, STDs, and hepatitis.

The internal workgroup reviewed previously created resources such as CDC's National Vulnerability Assessment and internal DHSS documents that utilized ranking methodologies, such as the Primary Care Needs Assessment 2015.[12] As part of the grant activities, CDC offered guidance on the project and arranged several conference calls and webinars to share examples from other states as well as CDC, such as the Social Vulnerability Index.[13]

Following completion of the 2020 vulnerability assessments project, DHSS made plans to evaluate the process and materials to recommend enhancements for future vulnerability assessment work. Funding for further vulnerability assessment work was requested through the Overdose Data to Action grant. Unfortunately, the emergence of COVID-19 in early 2020 led to most of the vulnerability assessment project staff being reassigned to COVID-19 response efforts. Vulnerability assessment work was largely halted until early 2022, when COVID-19 cases had begun to decline and increased automation of COVID-19 activities allowed staff to return to normal duties. It was determined that an update of the vulnerability assessment data using the existing methodology fell within staffing capacity at that time. The decision to utilize the existing methodology greatly reduced the amount of staff time needed for the update project, as development of the methodology was the most time-consuming portion of the

timeline in 2020. This decision also means that the results from the 2022 update are directly comparable to the 2020 results, as the same methodology and indicators (with one exception, described in the Indicators section of this report).

Work for the 2022 update was a collaboration of multiple units within the Division of Community and Public Health. In the intervening years, BRDI was disbanded, with staff reassigned to other units including BHCADD, which continued to contribute to the project, and the Office of Epidemiology (formerly BEVS). BHSH continued to serve as the lead for overdose and bloodborne infection prevention and treatment.
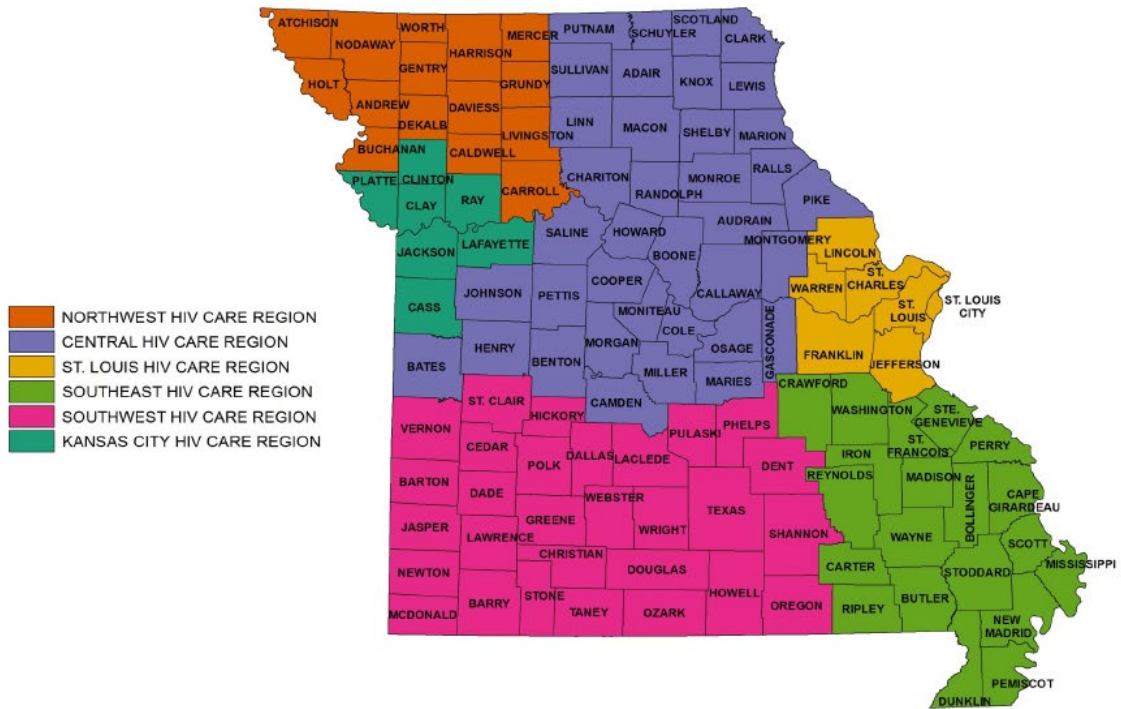
Stakeholder Meetings

When the assessments were initially developed in 2019, one of the CDC's project requirements under the opioid crisis grant, was that DHSS organize a new or engage an existing stakeholder group to provide input on the vulnerability assessments' design, support development of data use agreements, and inform the use of the assessments' findings to target services that will maximally reduce risk of overdoses and risk of bloodborne infection spread through nonsterile drug injection. DHSS staff from a variety of programs participated on the internal workgroup and provided state-level program feedback. DHSS also partnered with six LPHAs, one in each HIV Care Region. (A map of the HIV Care Regions is shown on page 8.) Each of these LPHA partners collaborated with DHSS to arrange a small stakeholder meeting in their HIV Care Region. DHSS contracted with a facilitator from the University of Missouri – Columbia, Disaster and Community Crisis Center (DCC) to run the meetings, while the LPHA determined and made arrangements for the meeting location and developed the list of invitees. These meetings provided community-level feedback from a variety of types of stakeholders. Feedback provided at these meetings led to several changes that were incorporated into the methodology prior to its final release. Details on these changes are described in the Stakeholder Feedback section of the "Missouri Opioid Overdose and Bloodborne Infection Vulnerability Assessment 2020" report.

Stakeholder meetings were once again organized in 2022. Although no immediate changes to the methodology were planned, DHSS wanted to gather feedback on several other important topics.

- Changes between the 2019 and 2022 more vulnerable counties.
- Suggestions for future vulnerability assessment work, including additional products that could developed as well potential methodology or data source changes.
- Impacts of COVID-19 on opioid overdoses, bloodborne infections, and efforts to prevent these conditions.
- Input on how assessment results could be used to better target services at the state and local levels.

For the 2022 meetings, the DCC was again selected to handle facilitation efforts. Due to the heavy workload from COVID-19 and other issues at the time of development from both state and local levels of public health, the DCC led efforts to organize the stakeholder meetings. In partnership with DHSS, the facilitation team handled the site selection, marketing, registration and other logistics. DHSS and the facilitators reached out to the LPHA in the jurisdictions where meetings were to be held for their awareness and input. A table showing the date and location of each stakeholder meeting is included on page 8. Several DHSS staff attended each session in order to assist with any technical questions about the assessments.

MISSOURI HIV CARE REGIONS

Legend:
- NORTHWEST HIV CARE REGION
- CENTRAL HIV CARE REGION
- ST. LOUIS HIV CARE REGION
- SOUTHEAST HIV CARE REGION
- SOUTHWEST HIV CARE REGION
- KANSAS CITY HIV CARE REGION

2022 Vulnerability Assessment Stakeholder Meetings

Date	Location	HIV Care Region
July 12, 2022	Liberty – Clay County Public Health Center	Kansas City Metro
July 13, 2022	St. Joseph – Remington Nature Center	Northwest
August 9, 2022	St. Louis County Library – Thornhill Branch	St. Louis Metro
August 10, 2022	Cape Girardeau Public Library	Southeast
September 20, 2022	Columbia Public Library	Central
September 26, 2022	Springfield Library Center	Southwest

Stakeholder Feedback

Stakeholders provided input on a variety of topics.

Assessment Indicators

Participants discussed the lack of data on services that could impact overdose occurrence, such as prevention programs, syringe exchange efforts, naloxone and fentanyl test strip distribution, availability of crisis services, coping training and many others. Multiple health issues were noted that could impact overdoses, particularly child trauma and Adverse Childhood Expereinces (ACEs). Additional measures of mental health could be useful, as some individuals may be using opioids to self-medicate. Stakeholders reported an increase in the use of stimulants such as methamphetamines in the communities and suggested expanding the overdose indicators to include this category of substances. Inclusion of data on additional substances could help with design of more specific interventions and programs. There was also discussion of possible changes in the administration of substances such as oral ingestion versus injection and potential impacts on overdoses, with oral opioids more frequently laced with other substances such as fentanyl. A common concern was that the increased availability of naloxone may be leading to overdoses that are treated without being captured in traditional data systems such as ER visits. Thus, there may be a need for additional or different indicators to measure overdose vulnerability versus actual opioid overdoses. Some of the indicators discussed were considered by the DHSs workgroup during development of the methodology for the 2020 assessments. Information regarding indicators that were considered, but not included, as well as the reason they were not included, is available in Appendix D of the "Missouri Opioid Overdose and Bloodborne Infections Vulnerability Assessments 2020" report.

Data Presentation

Stakeholders indicated that the maps were helpful for visualizing statewide patterns. Several suggestions for enhancing the data presentation were provided, such as displaying national data or some other baseline to provide a point of comparison. Multiple comments focused on the need for more detailed assessments of metropolitan areas. For example, mapping metropolitan statistical areas to provide an overview of vulnerability in urban areas could balance the appearance of cities having less vulnerability due to available resources when those resources are actually often stretched due to serving a larger surrounding area. Use of zip code data would help to make targeting easier and more effective within communities, as prevention messages and approaches could be tailored to specific populations. Developing an interactive format to animate changes in data between the original 2020 report and the 2022 update could highlight changes.

Use of Results

Stakeholders were positive about their ability to use the results and identified multiple ways in which assessments results could be incorporated into their work. The results could help

determine where resources are most needed and assist with prioritize funding statewide or regionally. They also provide an opportunity to use the data as an educational and advocacy tool that can be shared with community members, leaders, and others in order to address stigma. It was noted that the graphics in particular are very helpful for use in community meetings as they visually portray the severity of the problem. They support the use of targeted services such as harm reduction, community outreach, and mobile services such as rapid testing for bloodborne diseases. Community coalitions could be developed in impacted areas to address these issues and share resources. It was noted that having the data already collected and analyzed is very helpful when completing grant and funding applications, especially for counties or organizations that do not have staff capacity for this type of work. Perhaps most importantly, results of assessments such as these often increase curiosity and spark more in-depth analysis within particular areas and help identify improvements to be made. For example, some stakeholders indicated they plan to compare the 2020 and 2022 assessments to determine which counties had improvements so they could reach out to discuss whether any interventions or resources were utilized that may have led to those improvements.

Impact of COVID-19

COVID-19 greatly impacted individuals affected by opioid overdoses and bloodborne infections in a multitude of ways. Individuals in recovery from substance abuse often relapsed as they experienced social isolation, decreased social supports, increased loneliness, economic stress, uncertainty and fear. Stakeholders reported a general increase in mental illness in their communities. Programs working to prevent or reduce the impact of these health conditions were often disrupted, with many staff shifted to COVID response. Bloodborne disease testing stopped or decreased in many places. Narcan distribution and other overdose prevention programs were interrupted. Practitioners were unable to visit locations such as drug courts to perform screenings and testing. Programs lost staff and some organizations shut down entirely, which led to reduced services. Many organizations are still understaffed today. General health professionals, who under normal circumstances may help individuals affected by substance use or bloodborne illnesses, may have been stretched, causing delays in prevention/education work. Some services transitioned from in-person to technology such as Zoom, which some individuals had difficulty accessing. There was a general sense from stakeholders of "playing catch-up." Practitioners in clinical medicine, prevention and treatment programs, and public health were not immune to the strains of the pandemic and many are batting their own mental health issues and feeling of overwhelm.

One positive impact of COVID-19 was noted. As described above, communities had a collective experiences of increases in stress, anxiety and other mental health issues related to the pandemic and the economic shutdown. This led to more widespread understanding of the experiences of individuals with mental illness. As people connected through social media throughout the pandemic, there was greater discussion of mental health issues. It is hoped that

these conversations will continue and result in the mental health and substance use issues becoming destigmatized.

The full impact of COVID-19 on opioid overdoses and bloodborne infections is likely not yet fully revealed by the 2022 update to the assessments. Due to the time required to prepare and finalize datasets, there is a delay in the data available for each update. Many of the indicators in the 2022 update are still reliant on data from years prior to the emergence of COVID-19. The data years utilized for each indicator in the 2022 update is detailed in Appendix C.

Indicators

Multiple data sources and health indicators were considered for inclusion in these assessments. These indicators were discussed by the internal workgroup, and extensive feedback was gathered from the stakeholder meetings in 2019. Selected indictors were assigned to one of two overarching categories: individual outcomes and community factors. The indicators in each category are listed below, and the *italicized* text within brackets ([]) next to each indicator notes whether the indicator was included in the opioid overdose assessment, the bloodborne infection assessment, or both assessments. Each indicator provides a slightly different perspective on the status of opioid overdoses and bloodborne infections in the state of Missouri.

The individual outcomes category attempts to measure the current level of substance use and bloodborne infection in each county in Missouri. Individual outcome indicators include:

- Drug overdose deaths – [*Both Assessments*].
- Opioid misuse ER visits – [*Both Assessments*].
- Drug-related arrests – [*Both Assessments*].
- Opioid-related substance use disorder treatment (SUDT) admissions – [*Opioid Overdose Assessment*].
- Poor mental health days [*Opioid Overdose Assessment*].
- Bloodborne illnesses (HIV, acute and chronic hepatitis B, and acute and chronic hepatitis C) – [*Bloodborne Infection Assessment*].
- Hepatitis C among ages 18 to 40 – [*Bloodborne Infection Assessment*].
- Injection drug use (IDU) among persons receiving SUDT – [*Bloodborne Infection Assessment*].

The community factors category examines the resources or other socioeconomic factors that may influence individual outcomes and impact access to care for substance use disorders and bloodborne infections. They include:

- Lack of a high school education – [*Both Assessments*].
- Median income – [*Both Assessments*].
- Poverty – [*Both Assessments*].
- Unemployment – [*Both Assessments*].
- Uninsured – [*Both Assessments*].

The tables below list the individual outcomes and community factors indicators used in each assessment. Indicators used in both assessments are printed in bold.

Opioid Overdose Vulnerability Assessment Indicators 2022

Individual Outcomes	Community Factors
Drug Overdose Deaths†‡	**Lack of a High School Education†**
Opioid Misuse ER Visits	**Median Income†‡**
Opioid-related Substance Use Disorder Treatment (SUDT) Admissions	**Poverty†**
Drug-related Arrests	**Unemployment†‡**
Poor Mental Health Days¥	**Uninsured†**

Bloodborne Infection Vulnerability Assessment Indicators 2022

Individual Outcomes	Community Factors
Drug Overdose Deaths†‡	**Lack of a High School Education†**
Bloodborne Illnesses (HIV, Acute and Chronic Hepatitis B, and Acute and Chronic Hepatitis C)	**Median Income†‡**
Hepatitis C Among Ages 18 to 40	**Poverty†**
Opioid Misuse ER Visits	**Unemployment†‡**
IDU Among Persons Receiving SUDT	**Uninsured†**
Drug-related Arrests	

† These indicators were considered for the National Vulnerability Assessment.

‡ Analysis completed for the National Vulnerability Assessment found these indicators to be more strongly associated with acute HCV infection, which was considered a proxy for unsafe IDU.[14]

¥The poor mental health days indicator in the 2020 assessments was represented by the number of self-reported frequent (>14 per month) poor mental health days from the 2016 Missouri County-Level Study. The 2022 poor mental health days indicator was represented by the average number of mentally unhealthy days reported in the past 30 days (age-adjusted) from the 2018 Behavioral Risk Factor Surveillance System as reported in the County Health Rankings. The change was made due to the lack of updates to the Missouri County-Level Study.

County-level rates for each indicator are provided in Appendix B. Data sources, data years, and notes for each indicator are provided in Appendix C. A list of other indicators considered but not included is provided Appendix D of the *Missouri Opioid Overdose and Bloodborne Infections Vulnerability Assessments 2020* report.

Ranking Methodology

The State of Missouri is composed of 114 counties and the City of St. Louis, which is an independent city that functions as its own county. (Throughout this report, the City of St. Louis will be specified as "St. Louis City," St. Louis County will be noted as simply "St. Louis," and "115 counties" will be used to indicate that St. Louis City was included along with the other Missouri counties.) For each indicator included in these assessments, the counties and St. Louis City were assigned a ranking from 1-115 based on their rates. The Excel rank formula was used to determine the rank position for each indicator. Rankings for each indicator for each county are found in Appendix A. Rates for each indicator for each county are found in Appendix B.

For some indicators, such as median income, the highest rate or value is better, indicating potentially less vulnerability. For other indicators, such as poverty or bloodborne illnesses, the lowest rate or value is better, potentially showing less vulnerability. This report is structured so that a rank of 1 always indicates a better outcome or more resources, and therefore less vulnerability, regardless of whether the actual indicator value is the highest or lowest. A rank of 115 always indicates a worse health outcome or fewer resources and greater vulnerability. Tied counties were all assigned the same rank number.

Since ranks in these assessments are based strictly off the rate values, they do not necessarily indicate any statistically significant difference between the rates in two different counties. Statistically significant difference could only be determined by running a statistical significance test. Statistical significance tests are performed to determine whether the difference between two rates is probably the result of chance factors or if it is meaningful. Statistical significance tests were not performed for these assessments.

After the counties were ranked for each indicator, the individual outcome indicator ranks were summed for each county and multiplied by three (3) to put more emphasis on these measures. (Please refer to the Stakeholder Feedback section of the *Missouri Opioid Overdose and Bloodborne Infections Vulnerability Assessments 2020* report for more information about the inclusion of this multiplier in the methodology.) This result was added to the sum of the ranks of the community factor indicators. The combined sums for each county were then ranked, and Excel match formulas were used to assign a quintile rank to each county. Quintile ranks provide a general idea of how a particular county compares to the rest of the counties in Missouri. A quintile is one-fifth of a ranked list. Since there are 115 Missouri counties, 23 are included in each quintile unless a tie occurred. A quintile ranking of 5 therefore indicates that a county is among those considered to be more vulnerable.[15]

Final Ranks and Corresponding Quintile Ranks

Final Ranks	Quintile Ranks	Vulnerability Level
1-23	1	
24-46	2	
47-69	3	
70-92	4	
93-115	5	More vulnerable

During development of the methodology in 2019, DHSS determined that only the counties ranked within quintile 5 on each assessment would be considered more vulnerable. The primary factor for the designation of only quintile 5 as more vulnerable was that the original CDC opioid crisis grant required DHSS to perform targeted outreach to each county identified as more vulnerable in the assessments. The original timeline for the 2019 project was one year and the vulnerability assessments had to be completed before those counties could be identified. DHSS determined that limiting the definition of "more vulnerable" to quintile 5 in each assessment would result in a number of counties that could reasonably be targeted before the end of the project period. Since there are two assessments, this definition of more vulnerable could have returned up to 46 counties (23 from each assessment) that would need to be targeted within the last few months of the grant period. Since there was considerable overlap between the assessments, only 30 counties were actually identified as more vulnerable in at least one of the 2019 assessments. In the 2022 update, 28 counties were identified as more vulnerable.

However, this does **not** mean that counties ranked in quintiles 1-4 are not considered vulnerable and do not need to better target services in order to decrease or prevent the impact of opioid overdoses and bloodborne infections in their communities. DHSS recognizes that all counties in Missouri are impacted by the opioid epidemic, and this is supported by national data. For 2019 and 2020, Missouri's overdose death rate of 28.1 per 100,000 population exceeded the national rate (which includes Washington, D.C.) of 24.7, ranking Missouri at 32nd among these jurisdictions (with rank 1 having the lowest/best rate). For this reason, DHSS is including data for all 115 counties in this document so that each can utilize the assessment findings to better target services in their areas. As DHSS works with the more vulnerable counties, strategies may be developed that can be shared across the state.

This ranking methodology was selected for this project for a few different reasons.

- The Opioid Crisis Supplemental Funding was initially awarded for only one year. Therefore, activities had to start quickly and progress at a rapid pace. Development of the plan to target services and other project activities required completion of the

vulnerability assessments before these related activities could be finalized. One advantage of this ranking methodology is that it could be developed fairly quickly.

- This ranking methodology is fairly simple and intuitive, which offered two advantages.
  - Various DHSS staff could contribute to the project even if they did not have advanced statistical training.
  - The methodology is easier for stakeholders with a variety of levels of statistical expertise to understand and use.
- This ranking methodology is flexible. As DHSS gathers feedback from stakeholders or identifies other potential indicators for inclusion, the structure can be easily modified.

As with any methodology, there are also disadvantages to using this model.

- As previously stated, the model does not utilize any sort of statistical significance testing to determine if there are meaningful differences between counties. It is possible that a county ranked in Quintile 1 may not have meaningfully different rates from a county ranked in a lower quintile.
- This method did not utilize any regression testing to measure the association between an indicator and the outcomes of opioid overdoses or bloodborne infections. Instead, DHSS staff referred to the National Vulnerability Assessment and guidance from CDC for assistance in selecting relevant indicators. For future versions of these assessments, DHSS would like to perform additional statistical modeling and compare the results to the current results.
- Any methodology that ranks all 115 counties requires that all, or nearly all, counties have comparable data available for each indicator. Otherwise, the ranks would be skewed by the missing or inconsistent information. DHSS considered several indicators that were not selected for inclusion in the assessments because reliable data were not available statewide from a centralized source. More information on indicators that were considered but not selected for inclusion in the assessments is available in Appendix D of the *Missouri Opioid Overdose and Bloodborne Infections Vulnerability Assessments 2020* report. Although these sources were not used in the assessments, counties are encouraged to utilize them in their local efforts if reliable data are available to them.
- Any methodology that ranks all 115 counties also requires that all, or nearly all, counties have reliable rates. Rates are considered reliable if they are based on at least 20 events (e.g., 20 deaths, 20 cases of bloodborne illness, etc.). If a county has a small number of events, a small increase or decrease in the number of cases from year to year could cause the rate to fluctuate dramatically. This could cause the county to be ranked much higher or lower depending on the time period selected for the ranking. DHSS attempted to minimize the effects of small numbers and the related unreliable rates by combining multiple years of data when possible. However, there were some indicators that were not included because rates for many counties remained unreliable even when multiple years were used. More information on indicators that were considered but not selected

for inclusion in the assessments is available in Appendix D of the *Missouri Opioid Overdose and Bloodborne Infection vulnerability Assessments 2020 report*. Although these sources were not used in the assessments, counties are encouraged to utilize them in their local efforts if reliable data are available to them.

- Data at the county-level may mask areas of vulnerability within counties. For example, if a particular county has areas of extremely high vulnerability but also areas that are much less vulnerable, the county-level data will average these areas. As a result, a county that may have an area of extremely high need may not have been considered an overall more vulnerable county in these assessments. For future versions of these assessments, DHSS would like to investigate the possibility of providing analysis of sub-county geographic levels.

At the end of the 2020 project, DHSS planned to take several additional steps to refine future vulnerability assessment work. Plans included hiring an evaluator to review the process used to develop the original report, identify potential additional indicators, and recommend enhancements to the methodology. However, with the emergence of COVID-19 in Missouri during March 2020, staff performing vulnerability assessment work, as well as those working in many other areas of public health, were reassigned to COVID-19 pandemic response activities. With the ending of Missouri's state of emergency due to COVID-19 in March 2022, staff were able to return to vulnerability assessment work. It was determined that staffing capacity at that time allowed for an update of the existing methodology with more recent data. A major benefit to utilizing the same methodology is the ability to make direct comparisons between the 2020 and 2022 assessment results. DHSS continues to explore possibilities for enhancement of the vulnerability assessments methodology and materials for future work in this area.

Statistical Notes

- Counts of 1 to 4 events are suppressed for confidentiality reasons.
- Rates based on counts of 1 to 19 events for an indicator are considered to be unreliable due to small numbers.[16] Unreliable rates are rates based on fewer than 20 events. They can be common for small population areas, such as certain counties, or for low-frequency events, such as cause-specific deaths or birth defects.
- When appropriate, multiple years of data were combined for indicators with unreliable rates for a large number of counties. If the use of data from one specified year is not required, combining multiple years of data can often generate a reliable rate. Similarly, data from several counties can be combined to create a reliable regional rate. In this report, multiple years of data were combined for some indicators with unreliable rates for a large number of counties. Where that was not possible, the data were suppressed and it was indicated in the table that the rate was unreliable.
- Data years vary by indicator. The most recent data available from each source were utilized in these rankings, and the frequency of updates varies by source. Because of the different data years involved, the internal workgroup decided to use the year of publication in the document title.
- Crude rates were used for all indicators unless otherwise indicated. Crude rates are calculated by dividing the total number of cases in a given time period by the total number of persons in the population and multiplying by a constant. A constant is a multiple of 10, such as 100 (for percentages), 1,000, 10,000, or 100,000. The constant used may vary by data source.
- County-level rankings for each indicator, final ranks, and quintile ranks are provided in Appendix A.
- Rates for each indicator and counts for some indicators are provided in Appendix B.
- Data sources, data years, and data notes for each indicator are provided in Appendix C.
- Resident means the person was a resident of Missouri at the time of the event in question. Some data sources collect both residence as well as a county of record (proxy for the location of the event). For example, data in BHCADD death records are reported by both resident status and county of record). If a Missouri resident dies or is treated in a hospital in another state, that event would be recorded as a Missouri resident death or hospitalization but would not appear in Missouri data under county of record. Missouri receives vital records and hospital data from most of its border states. Additional information on use of resident or recorded data is provided for specific indicators in Appendix C.
- For bloodborne disease indicators (e.g., HIV, hepatitis B, hepatitis C), data for persons diagnosed in Missouri correctional facilities are not included in the county-level data. These individuals, especially those in the state prison system, are often incarcerated in a different location than their residence (and likely location of infection) prior to imprisonment. Inclusion of these cases in the county data would distort the picture of

the epidemics in those areas. Individuals diagnosed at federal correctional facilities in Missouri are not included in the disease indicators.

Findings – Opioid Overdose Vulnerability Assessment 2022

The counties identified as more vulnerable to opioid overdoses are listed in the table below and shown on the map on the following page.

More Vulnerable Counties for Opioid Overdoses 2022

Rank	County
115	Crawford*
114	Washington*
113	Dent
112	Mississippi
111	Butler
110	St. Louis City
109	Wayne*
108	Wright*
107	St. Francois*
106	Scott
105	Iron*
104	Texas
103	Dunklin
102	Phelps
101	Ripley*
100	New Madrid
99	Buchanan
98	Stoddard
97	Pemiscot
96	Benton
95	Taney
94	Howell
93	Madison*

*The National Vulnerability Assessment identified these counties as most vulnerable to rapid dissemination of HIV/HCV among PWID.[17]

Missouri Opioid Overdose
Vulnerability Assessment 2022

Quintiles (with associated ranks)

- 1 (1-22)
- 2 (23-46)
- 3 (47-69)
- 4 (72-92)
- 5 (93-115) = More vulnerable
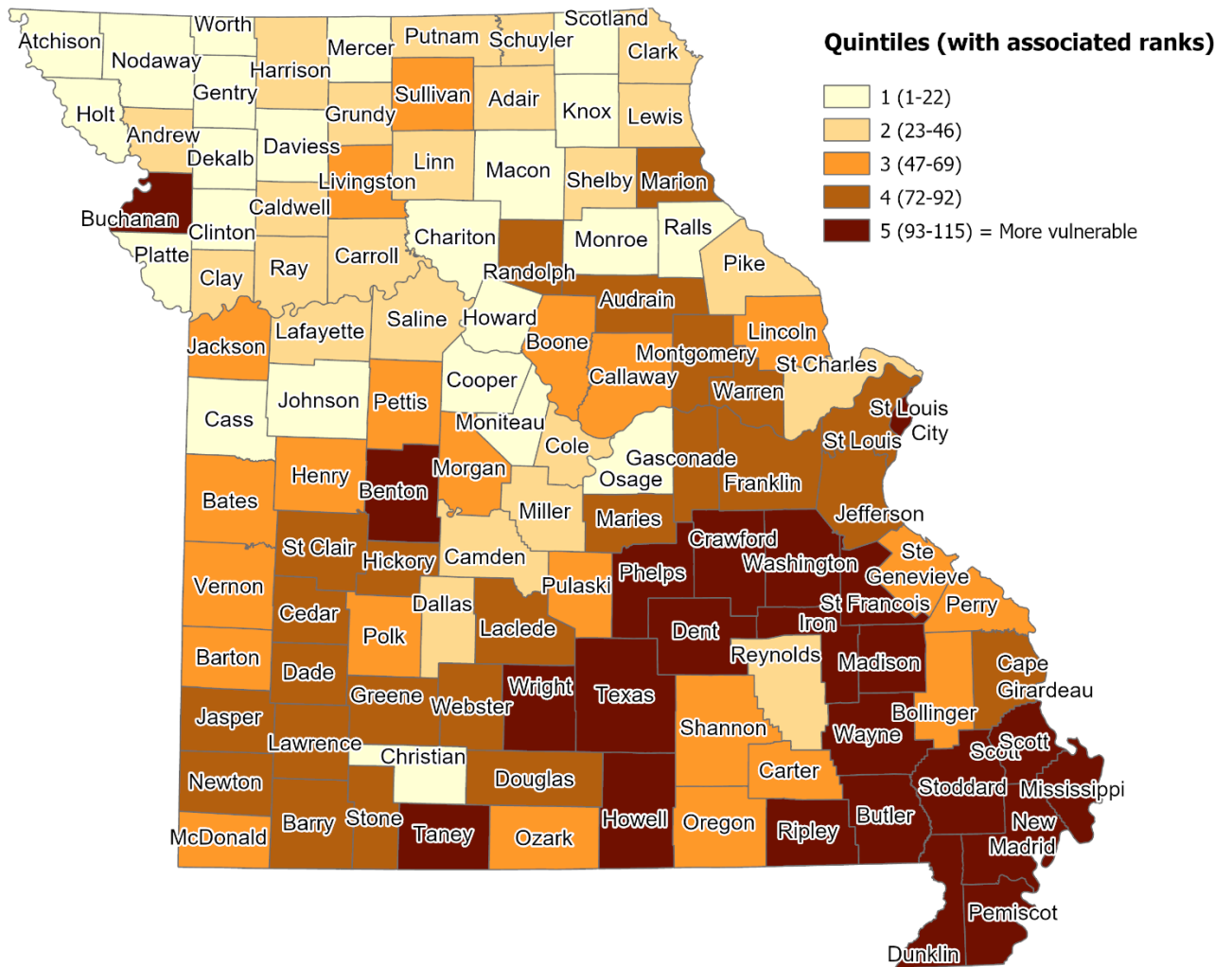
Findings – Bloodborne Infection Vulnerability Assessment 2022

The counties identified as more vulnerable to bloodborne infections are listed in the table below and shown on the map on the following page.

More Vulnerable Counties for Bloodborne Infections 2022

Rank	County
115	Crawford*
114	Washington*
113	Mississippi
112	St. Louis City
111	St. Francois*
110	Butler
109	Buchanan
108	Dent
107	Phelps
106	Wayne*
105	Taney
104	Texas
103	Iron*
102	Callaway
101	Laclede
100	Randolph
99	Greene
98	Stone
97	Howell
95	Dunklin
95	Ripley*
94	Wright*
93	Benton

*The National Vulnerability Assessment identified these counties as most vulnerable to rapid dissemination of HIV/HCV among PWID.[18]

Missouri Bloodborne Infection
Vulnerability Assessment 2022

Quintiles (with associated ranks)

- 1 (1-22)
- 2 (23-46)
- 3 (47-69)
- 4 (70-92)
- 5 (93-115) = More vulnerable
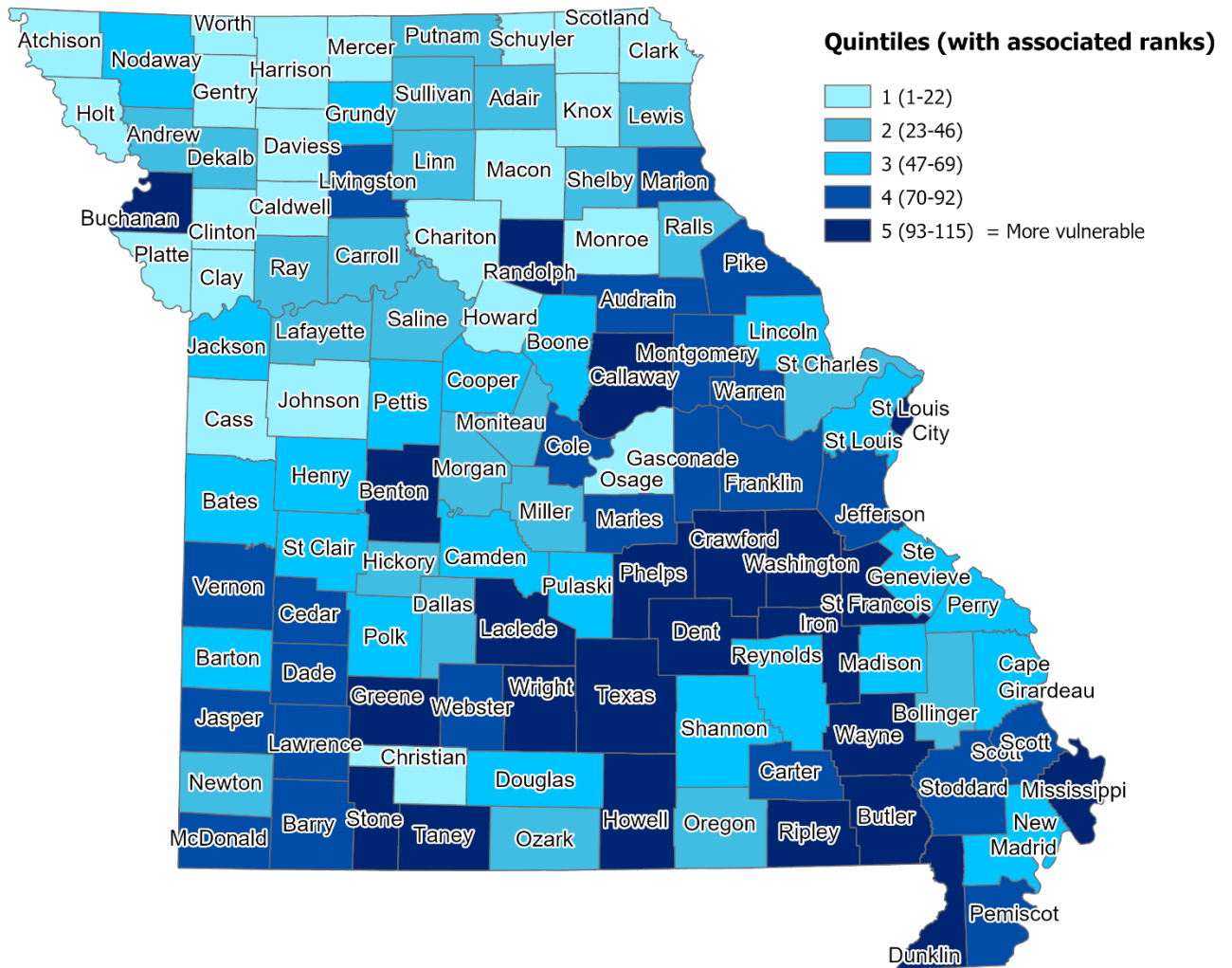
Comparison of the 2022 Opioid Overdose and Bloodborne Infection Vulnerability Assessments

The 2022 opioid overdose and bloodborne infection assessments were calculated separately, but several counties were identified as more vulnerable in both assessments.
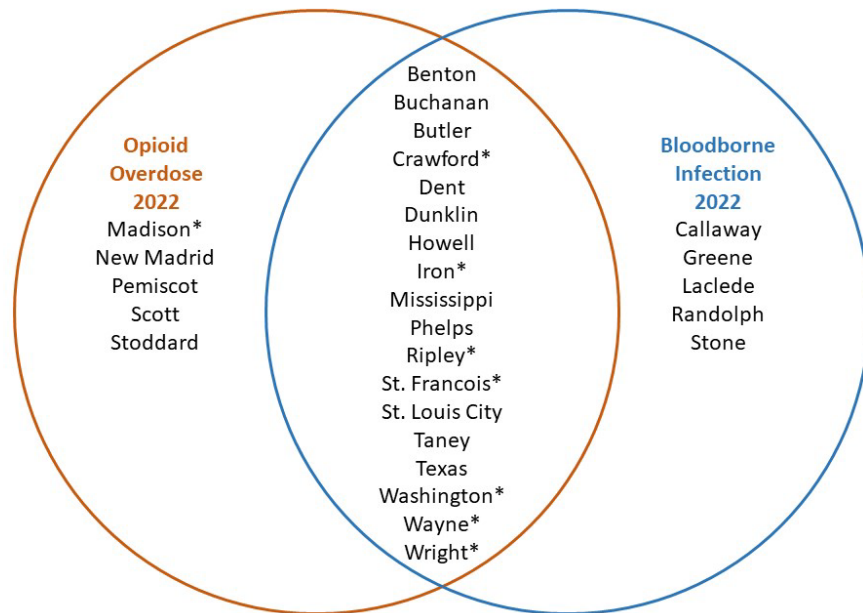
In both assessments, a majority of the counties identified as more vulnerable are located in the southern half of the state. Many of these counties are rural (Benton, Crawford, Dent, Iron, Madison, Mississippi, New Madrid, Pemiscot, Ripley, Stoddard, Texas, Washington, Wayne, and Wright). Multiple counties in southern Micropolitan Statistical Areas were represented in at least one of the assessments including Butler (Poplar Bluff), Dunklin (Kennett), Howell (West Plains), Laclede (Lebanon), Phelps (Rolla), St. Francois (Farmington), Scott (Sikeston), and Stone and Taney (Branson). Of the 28 counties ranked as more vulnerable in either assessment in 2022, only 4 (Buchanan, Callaway, Randolph, and St. Louis City) were located outside the southern portion of the state.

Many of the more vulnerable counties have in common high percentages of the population with less than a high school education, high poverty and unemployment rates, and low median incomes. However, some counties that ranked relatively well on community factor indicators were identified as more vulnerable. For example, Phelps County was ranked 24th for uninsured population but was still identified as more vulnerable to both opioid overdoses and bloodborne infections, which impact individuals from all populations and demographic groups.

*The National Vulnerability Assessment identified these counties as most vulnerable to rapid dissemination of HIV/HCV among PWID.[19]

Comparison of the 2020 and 2022 Assessments

Thirteen of the sixteen counties found to be more vulnerable to both opioid overdoses and bloodborne infections in the 2020 assessments were again found to be more vulnerable in 2022. These counties were: Butler, Crawford, Dent, Dunklin, Iron, Mississippi, Phelps, Ripley, St. Francois, St. Louis City, Taney, Washington, and Wayne. All of these jurisdictions except St. Louis City were located in the southern part of the state. Likewise, St. Louis City was the only jurisdiction located in a metropolitan statistical area; the others were all located in rural or micropolitan statistical areas.

Seven counties were found to be more vulnerable to opioid overdoses but not bloodborne infections in the 2020 assessments. Of these, only two were ranked more vulnerable in 2022. New Madrid remained more vulnerable to only opioid overdoses, while Benton was ranked as more vulnerable in both assessments in 2022. The other counties ranked as more vulnerable to only opioid overdoses in 2020 (Bates, Maries, Polk, Pulaski, and St. Clair) were not ranked as more vulnerable to either condition in 2022.

Seven counties were found to be more vulnerable to bloodborne infections but not opioid overdoses in the 2020 assessments. Of these, five were again ranked as more vulnerable in 2022. Greene and Stone continued to rank as more vulnerable to only bloodborne infections in 2022. By 2022, Madison was no longer ranked as more vulnerable to bloodborne infections but was ranked as more vulnerable to opioid overdoses. Howell and Wright ranked as more vulnerable to both conditions in 2022. Only Barry and Henry did not rank as more vulnerable in either ranking in 2022.

Several new counties appeared as more vulnerable in 2022 that were not considered more vulnerable in 2020. Buchanan and Texas ranked as more vulnerable to both conditions. Pemiscot, Scott, and Stoddard ranked as more vulnerable only to opioid overdoses, while Callaway, Laclede, and Randolph ranked as more vulnerable only to bloodborne infections.

The table on the following page lists all counties which have ranked as more vulnerable in either year and indicates in which category each ranked.

Comparison of More Vulnerable Jurisdictions in 2020 Assessments versus 2022 Update

Jurisdiction	Opioid Overdoses		Bloodborne Infections	
	2020	*2022*	*2020*	*2022*
Barry			X	
Bates*	X			
Benton	X	X		X
Buchanan		X		X
Butler	X	X	X	X
Callaway				X
Crawford*	X	X	X	
Dent	X	X	X	X
Dunklin	X	X	X	X
Greene			X	X
Henry			X	
Howell		X	X	X
Iron*	X	X	X	X
Jefferson	X		X	
Laclede				X
Madison*		X	X	
Maries	X			
Marion	X		X	
Mississippi	X	X	X	X
New Madrid	X	X		
Pemiscot		X		
Phelps	X	X	X	X
Polk	X			
Pulaski	X			
Randolph				X
Ripley*	X	X	X	X
Scott		X		
St. Clair	X			
St. Francois*	X	X	X	X
St. Louis City	X	X	X	X
Stoddard		X		
Stone			X	X
Taney	X	X	X	X
Texas		X		X
Warren	X		X	
Washington*	X	X	X	X
Wayne*	X	X	X	X
Wright*		X	X	X

*This county was also identified as vulnerable to rapid dissemination of HIV/hepatitis C virus (HCV) infection among persons who inject drugs (PWID) in a National Vulnerability Assessment prepared by the CDC.[20]

The percentages of counties located in rural, micropolitan, and metropolitan statistical areas that ranked as more vulnerable in either assessment or in both assessments remained relatively stable between 2020 and 2022, considering the small numbers in some of the categories. However, there was a noticeable change in the composition of the groups of counties found to be vulnerable to only opioid overdoses or to only bloodborne infections. In 2020, both of these lists included counties from all rural/urban categories. In 2022, no counties listed in a metropolitan statistical area were included in the list of counties ranked as vulnerable only to opioid overdose. The reverse was true the list of counties ranked as more vulnerable only to bloodborne infections; all of those counties were located in metropolitan or micropolitan statistical areas.

	2020	2022
Listed in either assessment		
Metropolitan statistical area	20% (6 counties)	14% (4 counties)
Micropolitan statistical area	30% (9 counties)	36% (10 counties)
Rural area	50% (15 counties)	50% (14 counties
Listed in both assessments		
Metropolitan statistical area	19% (3 counties)	11% (2 counties)
Micropolitan statistical area	38% (6 counties)	33% (6 counties)
Rural area	44% (7 counties)	56% (10 counties)
Only opioid overdose		
Metropolitan statistical area	29% (2 counties)	0% (0 counties)
Micropolitan statistical area	14% (1 county)	20% (1 county)
Rural area	57% (4 counties)	80% (4 counties)
Only bloodborne infections		
Metropolitan statistical area	14% (1 county)	50% (2 counties)
Micropolitan statistical area	29% (2 counties)	60% (3 counties)
Rural area	57% (4 counties)	0% (0 counties)

Comparison of both the opioid overdose and bloodborne infection maps from 2020 and 2022 reveals a general shift toward the southeast corner of the state, as shown on maps below.

Missouri Opioid Overdose Vulnerability Assessment 2020

Missouri Opioid Overdose Vulnerability Assessment 2022

Missouri Bloodborne Infection Vulnerability Assessment 2020

Missouri Bloodborne Infection Vulnerability Assessment 2022
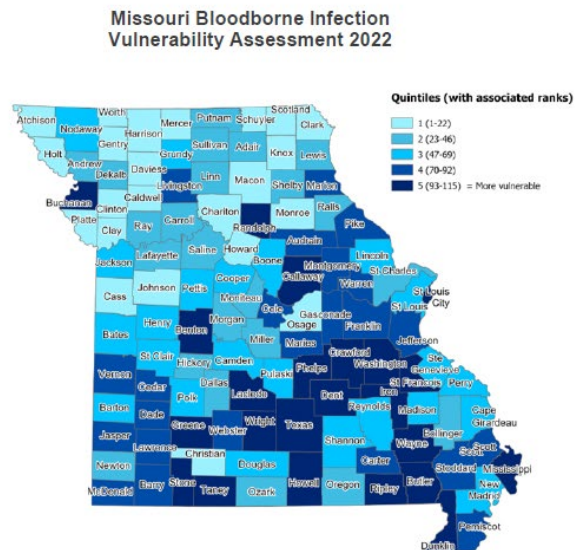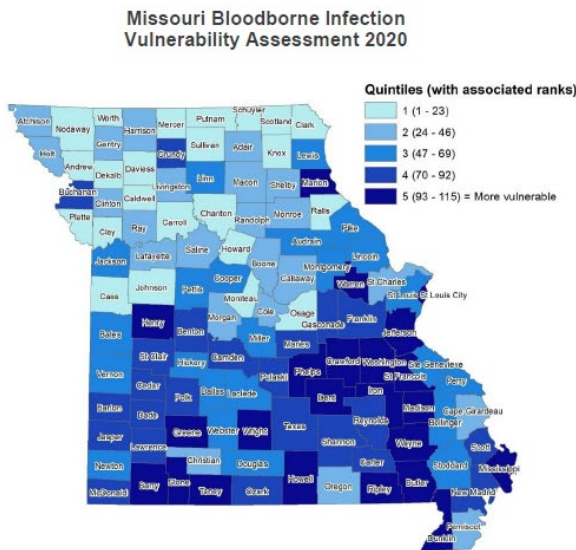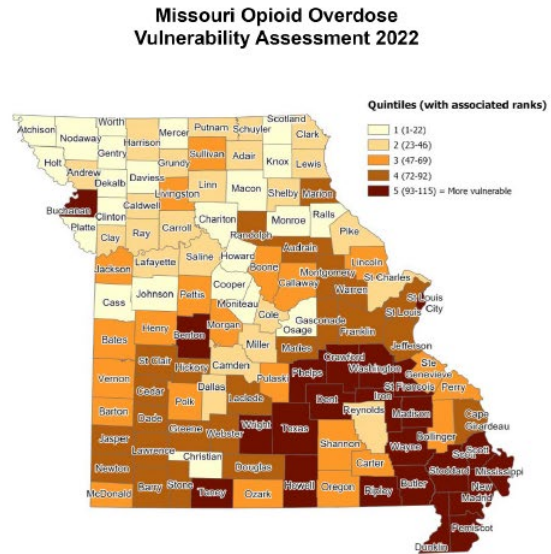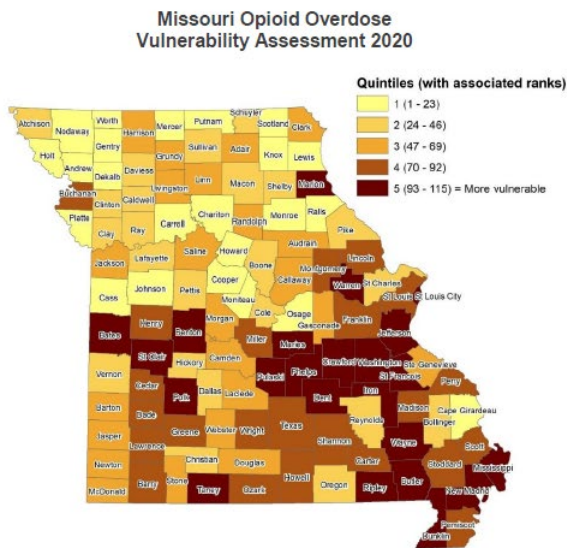
Comparison of the Missouri and National Vulnerability Assessments

The quintile rankings from the 2020 Missouri assessments as well as the 2022 update are shown in the table below for each of the 13 Missouri counties identified in the National Vulnerability Assessment as vulnerable to rapid dissemination of HIV/HCV among PWID. Six of these counties (Crawford, Iron, Ripley, St. Francois, Washington, and Wayne) were also identified as more vulnerable to both opioid overdoses and bloodborne infections in the 2020 Missouri assessments as well as in the 2022 update.

In 2020, Madison and Wright were identified as more vulnerable to bloodborne infections but not opioid overdoses. In the 2022 update, Madison was no longer considered more vulnerable to bloodborne infections but did rank as more vulnerable to opioid overdoses. Wright ranked as more vulnerable for both conditions in 2022. Bates County was identified as more vulnerable to opioid overdoses but not bloodborne infections in 2020 but was not ranked as more vulnerable in either assessment in the 2022 update. Four of the counties identified in the National Vulnerability Assessment (Cedar, Hickory, Ozark, and Reynolds) were not identified in either of the more vulnerable quintiles in the Missouri assessments in 2020 or 2022.

Differences between the Missouri and national assessments are likely due to the different indicators and methodologies used, as well as changes over time.

Counties Identified in the National Vulnerability Assessment	Missouri Opioid Overdose Vulnerability Assessment Quintile Ranking		Missouri Bloodborne Infection Vulnerability Assessment Quintile Ranking	
	2020	**2022**	**2020**	**2022**
Bates	5	3	3	3
Cedar	4	4	4	4
Crawford	5	5	5	5
Hickory	2	4	3	2
Iron	5	5	5	5
Madison	4	5	5	3
Ozark	4	3	4	2
Reynolds	2	2	4	3
Ripley	5	5	5	5
St. Francois	5	5	5	5
Washington	5	5	5	5
Wayne	5	5	5	5
Wright	4	5	5	5

The following counties were identified as higher risk in at least one of the 2022 Missouri vulnerability assessments but were not included in the list of higher risk counties from the National Vulnerability Assessment.

Counties Identified in the 2022 Missouri Vulnerability Assessments and Not Identified in the National Vulnerability Assessment	Opioid Overdose Vulnerability Assessment	Bloodborne Infection Vulnerability Assessment
Benton	✓	✓
Buchanan	✓	✓
Butler	✓	✓
Callaway		✓
Dent	✓	✓
Dunklin	✓	✓
Greene		✓
Howell	✓	✓
Laclede		✓
Mississippi	✓	✓
New Madrid	✓	
Pemiscot	✓	
Phelps	✓	✓
Randolph		✓
Scott	✓	
St. Louis City	✓	✓
Stoddard	✓	
Stone		✓
Taney	✓	✓
Texas	✓	✓

Next Steps

Programmatic Use

Current plans within DHSS include utilizing the findings of the assessments in regular programmatic work. Examples include:

- Scheduling discussions with more vulnerable counties to collaborate on prevention and harm reduction activities.
- Targeting distribution of funding and supplies.
- Developing formal plans.
- Offering trainings to stakeholders.

Additional Resources

DHSS staff are developing additional resources around the assessments. Data and resource profiles for each county are in development and will be posted on the vulnerability assessment website (https://health.mo.gov/data/opioids/assessments.php) when completed.

DHSS is also exploring options for developing resources for more granular levels of geography such as zip codes or census tracts to make information available for more targeted areas.

DHSS continues to develop additional resources surrounding overdoses and bloodborne infections. A bloodborne infection dashboard is in development, while an overdose dashboard is already available at https://health.mo.gov/data/opioids/.

Feedback Collection

DHSS plans to attend events to promote the assessments document after it is published, and will gather additional feedback at that time. The specific events have not yet been determined. Readers of this document are encouraged to continue to provide feedback by contacting DHSS. Although it may not be possible to make changes once the document is published, this feedback will inform any future versions of the assessments and related products. Feedback and questions about the document can be directed to:

Bureau of Health Care Analysis and Data Dissemination
PO Box 570
Jefferson City, MO 65102

Appendix A – Vulnerability Assessment Indicator Ranks and Results

The following tables provide the county-level ranks (from 1 to 115) for each of the indicators in the individual outcomes and community factors categories. The sum of the ranks for the individual outcome indicators is multiplied by three, while the sum of the ranks for the community factor indicators is not given any additional weight. The three columns in the final section of the table provide the sum of the two categories, the rank position of this sum (from 1 to 115), and the quintile ranking (from 1 to 5) used to determine the list of more vulnerable counties (i.e., the counties in quintile 5).

The Drug Overdose Death ranks that are shown in the opioid overdose (orange) and bloodborne infection (blue) tables incorporate both the county of residence and county of record ranks. These separate drug overdose death ranks are provided in a third (yellow) table.

Counties identified as vulnerable to rapid dissemination of HIV/HCV among PWID by the National Vulnerability Assessment are indicated with an asterisk (*) behind the county name.

These data are also available in a Microsoft Excel workbook available at https://health.mo.gov/data/opioids/assessments.php to allow for sorting and filtering of the results.

Missouri Opioid Overdose Vulnerability Assessment Indicator Ranks and Results – 2022

	Individual Outcomes						Community Factors						Results		
County	Drug Overdose Deaths†	Opioid Misuse ER Visits	Opioid-related SUDT	Drug-related Arrests	Poor Mental Health Days	Individual Outcomes Sum x 3	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured	Community Factors Sum	Sum of Categories	Sum Rank Position	Quintile
Adair	42	56	49	29	39	645	24	88	105	86	28	331	976	37	2
Andrew	36	96	21	97	13	789	14	15	5	17	6	57	846	32	2
Atchison	1	2	1	61	13	234	15	38	23	8	37	121	355	1	1
Audrain	19	61	68	102	71	963	72	71	50	65	47	305	1,268	76	4
Barry	24	66	57	73	58	834	91	70	94	65	82	402	1,236	72	4
Barton	29	41	63	37	71	723	59	76	91	106	59	391	1,114	52	3
Bates*	87	78	38	45	39	861	56	48	21	61	32	218	1,079	48	3
Benton	85	45	78	76	71	1,065	84	94	79	112	62	431	1,496	96	5
Bollinger	48	5	75	36	94	774	105	73	53	45	68	344	1,118	54	3
Boone	83	85	79	92	8	1041	3	23	82	49	10	167	1208	66	3
Buchanan	86	113	98	90	58	1,335	42	33	75	65	57	272	1,607	99	5
Butler	106	108	113	42	94	1,389	96	96	104	110	69	475	1,864	111	5
Caldwell	49	17	9	70	71	648	26	40	57	18	45	186	834	29	2
Callaway	68	93	61	114	13	1047	72	19	17	19	28	155	1,202	65	3
Camden	77	31	73	67	17	795	23	30	45	69	76	243	1,038	41	2
Cape Girardeau	92	42	104	98	8	1032	17	27	62	61	21	188	1220	69	4
Carroll	76	75	31	18	39	717	75	35	40	101	40	291	1008	40	2
Carter	51	83	11	27	84	768	81	97	30	49	110	367	1,135	57	3
Cass	65	52	36	54	8	645	8	4	8	33	13	66	711	20	1

*Identified as vulnerable to rapid dissemination of HIV/HCV among PWID by the National Vulnerability Assessment

†See Combined Rank for Drug Overdose Deaths table on pages 35-38.

ER = Emergency Room; SUDT = Substance Use Disorder Treatment

See Appendix C for information on data years, data sources, etc.

*Identified as vulnerable to rapid dissemination of HIV/HCV among PWID by the National Vulnerability Assessment

	Individual Outcomes						Community Factors						Results		
County	Drug Overdose Deaths†	Opioid Misuse ER Visits	Opioid-related SUDT	Drug-related Arrests	Poor Mental Health Days	Individual Outcomes Sum x 3	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured	Community Factors Sum	Sum of Categories	Sum Rank Position	Quintile
Cedar*	46	60	70	58	84	954	53	98	56	104	97	408	1,362	84	4
Chariton	12	26	5	20	23	258	18	55	37	22	32	164	422	3	1
Christian	55	70	33	28	13	597	11	11	12	22	21	77	674	17	1
Clark	29	3	43	89	58	666	71	43	48	22	86	270	936	36	2
Clay	72	74	42	43	2	699	5	3	6	42	17	73	772	24	2
Clinton	20	19	45	35	17	408	11	8	7	53	13	92	500	9	1
Cole	66	57	86	111	5	975	9	14	15	29	19	86	1061	45	2
Cooper	25	32	18	77	17	507	36	31	23	49	37	176	683	18	1
Crawford*	102	111	114	107	108	1,626	109	69	84	114	107	483	2,109	115	5
Dade	38	64	83	31	84	900	59	92	96	115	93	455	1,355	83	4
Dallas	44	44	41	12	84	675	93	81	30	26	85	315	990	39	2
Daviess	11	10	23	15	58	351	79	34	40	11	93	257	608	12	1
DeKalb	58	57	6	16	23	480	57	20	25	6	9	117	597	11	1
Dent	111	99	112	88	94	1,512	94	87	102	81	99	463	1,975	113	5
Douglas	17	53	29	59	100	774	98	104	92	87	100	481	1,255	74	4
Dunklin	62	37	60	103	113	1,125	113	105	112	102	104	536	1,661	103	5
Franklin	112	112	109	50	8	1,173	39	18	16	57	24	154	1,327	81	4
Gasconade	108	95	82	65	23	1,119	50	26	8	11	10	105	1,224	71	4
Gentry	40	67	21	1	58	561	33	46	45	33	48	205	766	23	1
Greene	99	105	103	62	39	1,224	13	60	62	33	55	223	1,447	92	4
Grundy	59	49	64	19	23	642	68	66	76	19	106	335	977	38	2

†See Combined Rank for Drug Overdose Deaths table on pages 35-38.

ER = Emergency Room; SUDT = Substance Use Disorder Treatment

See Appendix C for information on data years, data sources, etc.

| County | Individual Outcomes | | | | | | Community Factors | | | | | | Results | | |
	Drug Overdose Deaths†	Opioid Misuse ER Visits	Opioid-related SUDT	Drug-related Arrests	Poor Mental Health Days	Individual Outcomes Sum x 3	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured	Community Factors Sum	Sum of Categories	Sum Rank Position	Quintile
Harrison	7	42	17	21	71	474	45	83	66	45	59	298	772	24	2
Henry	67	45	79	14	71	828	50	64	94	89	66	363	1,191	61	3
Hickory*	68	22	27	78	94	867	87	112	76	95	76	446	1,313	80	4
Holt	1	85	28	32	17	489	16	42	13	19	16	106	595	10	1
Howard	16	9	8	10	39	246	49	32	38	57	17	193	439	4	1
Howell	45	70	100	56	84	1,065	63	102	100	47	91	403	1,468	94	5
Iron*	90	106	92	13	100	1,203	99	103	100	95	73	470	1,673	105	5
Jackson	89	73	66	51	23	906	20	25	43	57	57	202	1,108	50	3
Jasper	53	88	97	60	58	1068	66	45	73	79	82	345	1,413	89	4
Jefferson	114	103	108	63	23	1,233	34	6	10	79	23	152	1,385	85	4
Johnson	15	13	24	96	5	459	7	24	40	72	40	183	642	15	1
Knox	10	5	19	1	39	222	64	95	87	103	112	461	683	18	1
Laclede	99	72	71	72	58	1116	77	51	48	95	55	326	1,442	91	4
Lafayette	56	59	32	79	17	729	20	16	26	13	34	109	838	30	2
Lawrence	56	81	56	41	71	915	83	67	68	93	79	390	1,305	78	4
Lewis	33	1	20	94	39	561	38	62	85	13	45	243	804	26	2
Lincoln	105	102	102	23	39	1,113	29	7	18	33	19	106	1,219	67	3
Linn	22	40	77	108	39	858	30	63	54	1	40	188	1,046	42	2
Livingston	75	37	15	100	71	894	66	53	58	1	59	237	1,131	56	3
Macon	5	11	26	47	23	336	45	85	27	77	51	285	621	13	1

*Identified as vulnerable to rapid dissemination of HIV/HCV among PWID by the National Vulnerability Assessment
†See Combined Rank for Drug Overdose Deaths table on pages 35-38.
ER = Emergency Room; SUDT = Substance Use Disorder Treatment
See Appendix C for information on data years, data sources, etc.

	Individual Outcomes						Community Factors						Results		
County	Drug Overdose Deaths†	Opioid Misuse ER Visits	Opioid-related SUDT	Drug-related Arrests	Poor Mental Health Days	Individual Outcomes Sum x 3	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured	Community Factors Sum	Sum of Categories	Sum Rank Position	Quintile
Madison*	94	91	79	49	71	1152	86	80	39	53	49	307	1,459	93	5
Maries	108	18	94	83	58	1,083	68	49	71	89	65	342	1,425	90	4
Marion	78	32	87	115	39	1,053	48	44	76	65	26	259	1,312	79	4
McDonald	62	50	34	22	84	756	111	89	85	49	111	445	1,201	64	3
Mercer	1	14	54	1	23	279	39	50	13	8	88	198	477	6	1
Miller	52	29	55	33	39	624	57	52	69	74	54	306	930	35	2
Mississippi	61	98	105	82	100	1,338	115	106	109	113	105	548	1,886	112	5
Moniteau	38	7	14	1	23	249	76	17	21	53	81	248	497	8	1
Monroe	29	48	10	39	39	495	32	78	33	7	26	176	671	16	1
Montgomery	91	90	51	64	84	1140	77	54	61	33	34	259	1,399	88	4
Morgan	27	27	25	34	100	639	108	99	103	47	113	470	1,109	51	3
New Madrid	80	68	52	75	100	1,125	107	101	99	95	100	502	1,627	100	5
Newton	78	37	50	93	71	987	62	36	33	33	69	233	1,220	69	4
Nodaway	9	34	13	80	23	477	9	72	98	15	44	238	715	21	1
Oregon	6	51	40	11	100	624	95	114	105	26	109	449	1073	47	3
Osage	43	4	37	30	8	366	25	10	3	3	1	42	408	2	1
Ozark*	23	8	39	17	108	585	97	115	115	85	102	514	1,099	49	3
Pemiscot	72	34	44	86	113	1047	110	113	113	110	86	532	1,579	97	5
Perry	83	25	91	112	23	1,002	53	21	3	42	7	126	1,128	55	3
Pettis	46	30	58	105	39	834	68	59	62	89	88	366	1,200	63	3

*Identified as vulnerable to rapid dissemination of HIV/HCV among PWID by the National Vulnerability Assessment

†See Combined Rank for Drug Overdose Deaths table on pages 35-38.

ER = Emergency Room; SUDT = Substance Use Disorder Treatment

See Appendix C for information on data years, data sources, etc.

	Individual Outcomes						Community Factors						Results		
County	Drug Overdose Deaths†	Opioid Misuse ER Visits	Opioid-related SUDT	Drug-related Arrests	Poor Mental Health Days	Individual Outcomes Sum x 3	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured	Community Factors Sum	Sum of Categories	Sum Rank Position	Quintile
Phelps	110	101	110	106	23	1,350	42	74	93	77	24	310	1,660	102	5
Pike	93	45	48	44	23	759	89	58	50	74	30	301	1,060	44	2
Platte	59	27	12	46	1	435	1	2	2	33	4	42	477	6	1
Polk	68	84	67	40	39	894	39	65	66	33	74	277	1,171	59	3
Pulaski	113	82	93	38	5	993	6	29	50	89	52	226	1,219	67	3
Putnam	49	76	46	1	39	633	22	84	71	8	88	273	906	34	2
Ralls	28	21	30	55	23	471	28	22	35	69	10	164	635	14	1
Randolph	35	69	62	95	58	957	64	47	62	81	34	288	1,245	73	4
Ray	34	92	53	24	23	678	47	9	20	29	49	154	832	28	2
Reynolds*	32	76	7	1	94	630	105	93	88	83	69	438	1,068	46	2
Ripley*	13	93	90	71	113	1,140	103	108	111	87	84	493	1,633	101	5
Saline	40	23	16	74	39	576	90	68	58	22	30	268	844	31	2
Schuyler	25	16	3	25	84	459	55	86	80	42	98	361	820	27	2
Scotland	21	12	2	1	100	408	103	39	29	29	115	315	723	22	1
Scott	64	88	106	109	71	1,314	79	75	89	57	72	372	1,686	106	5
Shannon	8	36	65	1	112	666	102	111	114	93	113	533	1,199	62	3
Shelby	14	15	34	101	58	666	18	77	58	5	52	210	876	33	2
St. Charles	96	97	69	81	2	1,035	2	1	1	15	1	20	1,055	43	2
St. Clair	17	24	85	91	84	903	84	100	73	33	67	357	1,260	75	4
St. Francois*	104	114	111	66	71	1,398	81	57	55	76	37	306	1,704	107	5

*Identified as vulnerable to rapid dissemination of HIV/HCV among PWID by the National Vulnerability Assessment

†See Combined Rank for Drug Overdose Deaths table on pages 35-38.

ER = Emergency Room; SUDT = Substance Use Disorder Treatment

See Appendix C for information on data years, data sources, etc.

	Individual Outcomes						Community Factors						Results		
County	**Drug Overdose Deaths†**	**Opioid Misuse ER Visits**	**Opioid-related SUDT**	**Drug-related Arrests**	**Poor Mental Health Days**	**Individual Outcomes Sum x 3**	**Lack of a High School Education**	**Median Income**	**Poverty**	**Unemployment**	**Uninsured**	**Community Factors Sum**	**Sum of Categories**	**Sum Rank Position**	**Quintile**
St. Louis	107	104	99	85	4	1,197	4	5	11	69	5	94	1,291	77	4
St. Louis City	115	115	115	84	58	1,461	50	79	97	104	62	392	1,853	110	5
Ste. Genevieve	97	78	95	52	39	1083	30	12	19	26	3	90	1,173	60	3
Stoddard	71	61	89	99	71	1173	100	91	83	83	64	421	1,594	98	5
Stone	80	100	72	68	58	1134	59	41	28	95	40	263	1,397	87	4
Sullivan	97	54	59	26	39	825	87	56	69	3	74	289	1114	52	3
Taney	87	110	107	48	39	1,173	35	61	43	72	102	313	1,486	95	5
Texas	94	54	74	69	94	1155	91	107	109	108	96	511	1,666	104	5
Vernon	74	20	76	53	58	843	42	82	45	53	91	313	1156	58	3
Warren	99	107	88	87	17	1,194	36	13	30	61	13	153	1,347	82	4
Washington*	103	109	96	110	100	1,554	112	90	90	107	80	479	2,033	114	5
Wayne*	54	65	101	113	108	1,323	114	110	107	100	93	524	1,847	109	5
Webster	82	85	46	56	84	1059	74	37	80	61	76	328	1,387	86	4
Worth	1	80	4	1	23	327	26	28	35	32	8	129	456	5	1
Wright*	37	63	84	104	108	1188	101	109	108	108	107	533	1,721	108	5

Opioid Overdose Vulnerability Assessment Indicator Ranks – 2022

*Identified as vulnerable to rapid dissemination of HIV/HCV among PWID by the National Vulnerability Assessment

†See Combined Rank for Drug Overdose Deaths table on pages 35-38.

ER = Emergency Room; SUDT = Substance Use Disorder Treatment

See Appendix C for information on data years, data sources, etc.

Missouri Bloodborne Infection Vulnerability Assessment Indicator Ranks and Results – 2022

	Individual Outcomes							Community Factors						Results		
County	Drug Overdose Deaths†	Bloodborne Illnesses (HIV, HBV, HCV)	HCV Among Ages 18 to 40	Opioid Misuse ER Visits	IDU Among Persons Receiving SUDT	Drug-related Arrests	Individual Outcomes Sum x 3	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured	Community Factors Sum	Sum of Categories	Sum Rank Position	Quintile
Adair	42	16	27	56	101	29	813	24	88	105	86	28	331	1,144	38	2
Andrew	36	51	52	96	34	97	1098	14	15	5	17	6	57	1155	39	2
Atchison	1	24	49	2	1	61	414	15	38	23	8	37	121	535	8	1
Audrain	19	112	113	61	63	102	1,410	72	71	50	65	47	305	1,715	90	4
Barry	24	85	74	66	89	73	1,233	91	70	94	65	82	402	1,635	85	4
Barton	29	75	73	41	62	37	951	59	76	91	106	59	391	1,342	53	3
Bates*	87	34	42	78	78	45	1,092	56	48	21	61	32	218	1,310	49	3
Benton	85	77	56	45	95	76	1,302	84	94	79	112	62	431	1,733	93	5
Bollinger	48	41	50	5	28	36	624	105	73	53	45	68	344	968	29	2
Boone	83	53	28	85	58	92	1197	3	23	82	49	10	167	1,364	60	3
Buchanan	86	110	111	113	109	90	1,857	42	33	75	65	57	272	2,129	109	5
Butler	106	95	95	108	112	42	1,674	96	96	104	110	69	475	2,149	110	5
Caldwell	49	31	6	17	16	70	567	26	40	57	18	45	186	753	17	1
Callaway	68	115	115	93	63	114	1,704	72	19	17	19	28	155	1,859	102	5
Camden	77	44	61	31	80	67	1,080	23	30	45	69	76	243	1,323	50	3
Cape Girardeau	92	39	44	42	92	98	1221	17	27	62	61	21	188	1409	65	3
Carroll	76	22	26	75	26	18	729	75	35	40	101	40	291	1020	32	2
Carter	51	93	92	83	41	27	1,161	81	97	30	49	110	367	1,528	71	4
Cass	65	28	25	52	13	54	711	8	4	8	33	13	66	777	21	1
Cedar*	46	83	80	60	75	58	1,206	53	98	56	104	97	408	1,614	83	4

*Identified as vulnerable to rapid dissemination of HIV/HCV among PWID by the National Vulnerability Assessment

†See Combined Rank for Drug Overdose Deaths table on pages 35-38.

ER = Emergency Room; HBV = Hepatitis B Virus; HCV = Hepatitis C Virus; HIV = Human Immunodeficiency Virus; IDU = Injection Drug Use; SUDT = Substance Use Disorder Treatment

See Appendix C for information on data years, data sources, etc.

County	Individual Outcomes							Community Factors						Results		
	Drug Overdose Deaths†	Bloodborne Illnesses (HIV, HBV, HCV)	HCV Among Ages 18 to 40	Opioid Misuse ER Visits	IDU Among Persons Receiving SUDT	Drug-related Arrests	Individual Outcomes Sum x 3	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured	Community Factors Sum	Sum of Categories	Sum Rank Position	Quintile
Chariton	12	26	43	26	11	20	414	18	55	37	22	32	164	578	10	1
Christian	55	30	39	70	17	28	717	11	11	12	22	21	77	794	22	1
Clark	29	4	10	3	31	89	498	71	43	48	22	86	270	768	19	1
Clay	72	18	11	74	12	43	690	5	3	6	42	17	73	763	18	1
Clinton	20	10	30	19	28	35	426	11	8	7	53	13	92	518	7	1
Cole	66	99	99	57	61	111	1,479	9	14	15	29	19	86	1,565	75	4
Cooper	25	111	112	32	27	77	1,152	36	31	23	49	37	176	1,328	51	3
Crawford*	102	98	104	111	108	107	1,890	109	69	84	114	107	483	2,373	115	5
Dade	38	80	87	64	83	31	1,149	59	92	96	115	93	455	1,604	81	4
Dallas	44	79	70	44	45	12	882	93	81	30	26	85	315	1,197	44	2
Daviess	11	2	14	10	6	15	174	79	34	40	11	93	257	431	2	1
DeKalb	58	113	106	57	7	16	1071	57	20	25	6	9	117	1188	43	2
Dent	111	74	79	99	99	88	1,650	94	87	102	81	99	463	2,113	108	5
Douglas	17	55	58	53	50	59	876	98	104	92	87	100	481	1,357	56	3
Dunklin	62	82	59	37	71	103	1,242	113	105	112	102	104	536	1,778	96	5
Franklin	112	54	71	112	74	50	1,419	39	18	16	57	24	154	1,573	76	4
Gasconade	108	63	90	95	55	65	1,428	50	26	8	11	10	105	1,533	73	4
Gentry	40	11	22	67	47	1	564	33	46	45	33	48	205	769	20	1
Greene	99	92	65	105	102	62	1,575	13	60	62	33	55	223	1,798	99	5
Grundy	59	67	51	49	97	19	1,026	68	66	76	19	106	335	1,361	59	3

*Identified as vulnerable to rapid dissemination of HIV/HCV among PWID by the National Vulnerability Assessment

†See Combined Rank for Drug Overdose Deaths table on pages 35-38.

ER = Emergency Room; HBV = Hepatitis B Virus; HCV = Hepatitis C Virus; HIV = Human Immunodeficiency Virus; IDU = Injection Drug Use; SUDT = Substance Use Disorder Treatment

See Appendix C for information on data years, data sources, etc.

	Bloodborne Infection Vulnerability Assessment Indicator Ranks – 2022															
	Individual Outcomes							Community Factors						Results		
County	Drug Overdose Deaths†	Bloodborne Illnesses (HIV, HBV, HCV)	HCV Among Ages 18 to 40	Opioid Misuse ER Visits	IDU Among Persons Receiving SUDT	Drug-related Arrests	Individual Outcomes Sum x 3	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured	Community Factors Sum	Sum of Categories	Sum Rank Position	Quintile
Harrison	7	25	7	42	35	21	411	45	83	66	45	59	298	709	15	1
Henry	67	78	77	45	100	14	1,143	50	64	94	89	66	363	1,506	69	3
Hickory*	68	62	9	22	5	78	732	87	112	76	95	76	446	1,178	41	2
Holt	1	12	17	85	20	32	501	16	42	13	19	16	106	607	12	1
Howard	16	32	15	9	4	10	258	49	32	38	57	17	193	451	3	1
Howell	45	96	91	70	103	56	1,383	63	102	100	47	91	403	1,786	97	5
Iron*	90	89	102	106	77	13	1,431	99	103	100	95	73	470	1,901	103	5
Jackson	89	87	47	73	49	51	1,188	20	25	43	57	57	202	1,390	64	3
Jasper	53	88	78	88	94	60	1,383	66	45	73	79	82	345	1,728	92	4
Jefferson	114	56	62	103	82	63	1,440	34	6	10	79	23	152	1,592	80	4
Johnson	15	20	13	13	21	96	534	7	24	40	72	40	183	717	16	1
Knox	10	5	16	5	9	1	138	64	95	87	103	112	461	599	11	1
Laclede	99	68	84	72	107	72	1,506	77	51	48	95	55	326	1,832	101	5
Lafayette	56	13	19	59	30	79	768	20	16	26	13	34	109	877	26	2
Lawrence	56	63	67	81	69	41	1,131	83	67	68	93	79	390	1,521	70	4
Lewis	33	8	36	1	25	94	591	38	62	85	13	45	243	834	25	2
Lincoln	105	60	46	102	72	23	1,224	29	7	18	33	19	106	1,330	52	3
Linn	22	19	33	40	110	108	996	30	63	54	1	40	188	1,184	42	2
Livingston	75	105	107	37	44	100	1404	66	53	58	1	59	237	1,641	86	4
Macon	5	7	5	11	46	47	363	45	85	27	77	51	285	648	13	1

*Identified as vulnerable to rapid dissemination of HIV/HCV among PWID by the National Vulnerability Assessment

†See Combined Rank for Drug Overdose Deaths table on pages 35-38.

ER = Emergency Room; HBV = Hepatitis B Virus; HCV = Hepatitis C Virus; HIV = Human Immunodeficiency Virus; IDU = Injection Drug Use; SUDT = Substance Use Disorder Treatment

See Appendix C for information on data years, data sources, etc.

	Individual Outcomes							Community Factors						Results		
County	Drug Overdose Deaths†	Bloodborne Illnesses (HIV, HBV, HCV)	HCV Among Ages 18 to 40	Opioid Misuse ER Visits	IDU Among Persons Receiving SUDT	Drug-related Arrests	Individual Outcomes Sum x 3	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured	Community Factors Sum	Sum of Categories	Sum Rank Position	Quintile
Madison*	94	35	63	91	65	49	1,191	86	80	39	53	49	307	1,498	67	3
Maries	108	70	76	18	98	83	1,359	68	49	71	89	65	342	1,701	89	4
Marion	78	84	72	32	106	115	1,461	48	44	76	65	26	259	1,720	91	4
McDonald	62	100	97	50	39	22	1,110	111	89	85	49	111	445	1,555	74	4
Mercer	1	29	19	14	53	1	351	39	50	13	8	88	198	549	9	1
Miller	52	58	54	29	90	33	948	57	52	69	74	54	306	1,254	45	2
Mississippi	61	109	105	98	111	82	1,698	115	106	109	113	105	548	2,246	112	5
Moniteau	38	106	103	7	18	1	819	76	17	21	53	81	248	1067	35	2
Monroe	29	22	31	48	38	39	621	32	78	33	7	26	176	797	23	1
Montgomery	91	57	82	90	59	64	1,329	77	54	61	33	34	259	1,588	79	4
Morgan	27	52	48	27	15	34	609	108	99	103	47	113	470	1,079	36	2
New Madrid	80	36	32	68	41	75	996	107	101	99	95	100	502	1,498	67	3
Newton	78	59	40	37	37	93	1,032	62	36	33	33	69	233	1,265	46	2
Nodaway	9	100	94	34	33	80	1050	9	72	98	15	44	238	1288	47	3
Oregon	6	33	53	51	8	11	486	95	114	105	26	109	449	935	28	2
Osage	43	3	18	4	10	30	324	25	10	3	3	1	42	366	1	1
Ozark*	23	71	85	8	14	17	654	97	115	115	85	102	514	1,168	40	2
Pemiscot	72	65	23	34	68	86	1044	110	113	113	110	86	532	1,576	77	4
Perry	83	42	68	25	87	112	1,251	53	21	3	42	7	126	1,377	63	3
Pettis	46	43	38	30	66	105	984	68	59	62	89	88	366	1,350	55	3

*Identified as vulnerable to rapid dissemination of HIV/HCV among PWID by the National Vulnerability Assessment

†See Combined Rank for Drug Overdose Deaths table on pages 35-38.

ER = Emergency Room; HBV = Hepatitis B Virus; HCV = Hepatitis C Virus; HIV = Human Immunodeficiency Virus; IDU = Injection Drug Use; SUDT = Substance Use Disorder Treatment

See Appendix C for information on data years, data sources, etc.

County	Bloodborne Infection Vulnerability Assessment Indicator Ranks – 2022															
	Individual Outcomes							Community Factors						Results		
	Drug Overdose Deaths†	Bloodborne Illnesses (HIV, HBV, HCV)	HCV Among Ages 18 to 40	Opioid Misuse ER Visits	IDU Among Persons Receiving SUDT	Drug-related Arrests	Individual Outcomes Sum x 3	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured	Community Factors Sum	Sum of Categories	Sum Rank Position	Quintile
Phelps	110	81	81	101	93	106	1,716	42	74	93	77	24	310	2,026	107	5
Pike	93	102	93	45	81	44	1,374	89	58	50	74	30	301	1,675	88	4
Platte	59	6	8	27	2	46	444	1	2	2	33	4	42	486	5	1
Polk	68	66	57	84	88	40	1,209	39	65	66	33	74	277	1,486	66	3
Pulaski	113	45	24	82	76	38	1,134	6	29	50	89	52	226	1,360	58	3
Putnam	49	40	66	76	43	1	825	22	84	71	8	88	273	1098	37	2
Ralls	28	46	60	21	36	55	738	28	22	35	69	10	164	902	27	2
Randolph	35	108	110	69	95	95	1536	64	47	62	81	34	288	1,824	100	5
Ray	34	37	34	92	60	24	843	47	9	20	29	49	154	997	31	2
Reynolds*	32	97	101	76	3	1	930	105	93	88	83	69	438	1,368	61	3
Ripley*	13	91	88	93	70	71	1,278	103	108	111	87	84	493	1,771	95	5
Saline	40	27	21	23	56	74	723	90	68	58	22	30	268	991	30	2
Schuyler	25	9	12	16	24	25	333	55	86	80	42	98	361	694	14	1
Scotland	21	1	1	12	19	1	165	103	39	29	29	115	315	480	4	1
Scott	64	48	35	88	85	109	1,287	79	75	89	57	72	372	1,659	87	4
Shannon	8	90	89	36	51	1	825	102	111	114	93	113	533	1,358	57	3
Shelby	14	15	1	15	52	101	594	18	77	58	5	52	210	804	24	2
St. Charles	96	17	29	97	22	81	1026	2	1	1	15	1	20	1,046	33	2
St. Clair	17	71	55	24	79	91	1,011	84	100	73	33	67	357	1,368	61	3
St. Francois*	104	114	114	114	105	66	1,851	81	57	55	76	37	306	2,157	111	5

*Identified as vulnerable to rapid dissemination of HIV/HCV among PWID by the National Vulnerability Assessment

†See Combined Rank for Drug Overdose Deaths table on pages 35-38.

ER = Emergency Room; HBV = Hepatitis B Virus; HCV = Hepatitis C Virus; HIV = Human Immunodeficiency Virus; IDU = Injection Drug Use; SUDT = Substance Use Disorder Treatment

See Appendix C for information on data years, data sources, etc.

	Bloodborne Infection Vulnerability Assessment Indicator Ranks – 2022															
	Individual Outcomes							Community Factors						Results		
County	Drug Overdose Deaths†	Bloodborne Illnesses (HIV, HBV, HCV)	HCV Among Ages 18 to 40	Opioid Misuse ER Visits	IDU Among Persons Receiving SUDT	Drug-related Arrests	Individual Outcomes Sum x 3	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured	Community Factors Sum	Sum of Categories	Sum Rank Position	Quintile
St. Louis	107	46	37	104	23	85	1,206	4	5	11	69	5	94	1,300	48	3
St. Louis City	115	107	83	115	114	84	1,854	50	79	97	104	62	392	2,246	112	5
Ste. Genevieve	97	38	69	78	84	52	1,254	30	12	19	26	3	90	1,344	54	3
Stoddard	71	50	41	61	73	99	1,185	100	91	83	83	64	421	1,606	82	4
Stone	80	76	96	100	91	68	1,533	59	41	28	95	40	263	1,796	98	5
Sullivan	97	21	1	54	54	26	759	87	56	69	3	74	289	1048	34	2
Taney	87	94	98	110	113	48	1,650	35	61	43	72	102	313	1,963	105	5
Texas	94	103	108	54	47	69	1,425	91	107	109	108	96	511	1,936	104	5
Vernon	74	69	75	20	115	53	1,218	42	82	45	53	91	313	1,531	72	4
Warren	99	61	64	107	57	87	1,425	36	13	30	61	13	153	1,578	78	4
Washington*	103	104	109	109	67	110	1,806	112	90	90	107	80	479	2,285	114	5
Wayne*	54	73	100	65	86	113	1,473	114	110	107	100	93	524	1,997	106	5
Webster	82	86	86	85	40	56	1,305	74	37	80	61	76	328	1,633	84	4
Worth	1	14	1	80	31	1	384	26	28	35	32	8	129	513	6	1
Wright*	37	49	45	63	104	104	1,206	101	109	108	108	107	533	1,739	94	5

*Identified as vulnerable to rapid dissemination of HIV/HCV among PWID by the National Vulnerability Assessment

†See Combined Rank for Drug Overdose Deaths table on pages 35-38.

ER = Emergency Room; HBV = Hepatitis B Virus; HCV = Hepatitis C Virus; HIV = Human Immunodeficiency Virus; IDU = Injection Drug Use; SUDT = Substance Use Disorder Treatment

See Appendix C for information on data years, data sources, etc.

Combined Drug Overdose Death Ranks for Opioid Overdose and Bloodborne Infection Vulnerability Assessments – 2022

County	Combined Rank for Drug Overdose Deaths – 2022			
	Residence County Rank	Recorded County Rank	Sum of Individual Ranks	Combined Drug Overdose Deaths Rank
Adair	24	55	79	42
Andrew	25	45	70	36
Atchison	1	1	2	1
Audrain	21	26	47	19
Barry	38	17	55	24
Barton	15	44	59	29
Bates*	89	80	169	87
Benton	85	81	166	85
Bollinger	50	42	92	48
Boone	77	88	165	83
Buchanan	83	85	168	86
Butler	102	108	210	106
Caldwell	36	57	93	49
Callaway	73	66	139	68
Camden	69	85	154	77
Cape Girardeau	90	95	185	92
Carroll	79	70	149	76
Carter	69	28	97	51
Cass	64	62	126	65
Cedar*	54	35	89	46
Chariton	12	21	33	12
Christian	58	46	104	55
Clark	13	46	59	29
Clay	65	77	142	72
Clinton	17	31	48	20
Cole	62	68	130	66
Cooper	15	41	56	25
Crawford*	100	103	203	102
Dade	75	1	76	38
Dallas	51	30	81	44

*Identified as vulnerable to rapid dissemination of HIV/HCV among PWID by the National Vulnerability Assessment

See Appendix C for information on data years, data sources, etc.

	Combined Rank for Drug Overdose Deaths – 2022			
County	Residence County Rank	Recorded County Rank	Sum of Individual Ranks	Combined Drug Overdose Deaths Rank
Daviess	9	20	29	11
DeKalb	51	58	109	58
Dent	108	114	222	111
Douglas	20	23	43	17
Dunklin	66	53	119	62
Franklin	113	111	224	112
Gasconade	108	109	217	108
Gentry	29	48	77	40
Greene	96	105	201	99
Grundy	48	63	111	59
Harrison	9	1	10	7
Henry	72	61	133	67
Hickory*	74	65	139	68
Holt	1	1	2	1
Howard	27	15	42	16
Howell	27	56	83	45
Iron*	93	84	177	90
Jackson	84	91	175	89
Jasper	54	48	102	53
Jefferson	114	112	226	114
Johnson	19	22	41	15
Knox	22	1	23	10
Laclede	99	102	201	99
Lafayette	57	48	105	56
Lawrence	46	59	105	56
Lewis	29	33	62	33
Lincoln	107	101	208	105
Linn	22	29	51	22
Livingston	76	72	148	75
Macon	6	1	7	5
Madison*	96	94	190	94

*Identified as vulnerable to rapid dissemination of HIV/HCV among PWID by the National Vulnerability Assessment

See Appendix C for information on data years, data sources, etc.

County	Combined Rank for Drug Overdose Deaths – 2022			
	Residence County Rank	Recorded County Rank	Sum of Individual Ranks	Combined Drug Overdose Deaths Rank
Maries	111	106	217	108
Marion	80	79	159	78
McDonald	59	60	119	62
Mercer	1	1	2	1
Miller	44	54	98	52
Mississippi	43	69	112	61
Moniteau	33	43	76	38
Monroe	40	19	59	29
Montgomery	92	87	179	91
Morgan	26	31	57	27
New Madrid	86	74	160	80
Newton	69	90	159	78
Nodaway	5	13	18	9
Oregon	7	1	8	6
Osage	42	38	80	43
Ozark*	36	17	53	23
Pemiscot	61	81	142	72
Perry	82	83	165	83
Pettis	41	48	89	46
Phelps	110	110	220	110
Pike	91	96	187	93
Platte	47	64	111	59
Polk	68	71	139	68
Pulaski	112	113	225	113
Putnam	56	37	93	49
Ralls	44	14	58	28
Randolph	35	33	68	35
Ray	29	38	67	34
Reynolds*	34	26	60	32
Ripley*	14	23	37	13
Saline	29	48	77	40

*Identified as vulnerable to rapid dissemination of HIV/HCV among PWID by the National Vulnerability Assessment

See Appendix C for information on data years, data sources, etc.

Combined Rank for Drug Overdose Deaths – 2022			
County	Residence County Rank	Recorded County Rank	Sum of Individual Ranks	Combined Drug Overdose Deaths Rank
Schuyler	18	38	56	25
Scotland	48	1	49	21
Scott	53	67	120	64
Shannon	11	1	12	8
Shelby	38	1	39	14
St. Charles	94	98	192	96
St. Clair	8	35	43	17
St. Francois*	103	104	207	104
St. Louis	105	107	212	107
St. Louis City	115	115	230	115
Ste. Genevieve	101	93	194	97
Stoddard	63	78	141	71
Stone	88	72	160	80
Sullivan	94	100	194	97
Taney	81	88	169	87
Texas	98	92	190	94
Vernon	67	76	143	74
Warren	104	97	201	99
Washington*	106	99	205	103
Wayne*	78	25	103	54
Webster	87	75	162	82
Worth	1	1	2	1
Wright*	59	16	75	37

*Identified as vulnerable to rapid dissemination of HIV/HCV among PWID by the National Vulnerability Assessment

See Appendix C for information on data years, data sources, etc.

Appendix B – Vulnerability Assessment Indicator Counts and Rates

Tables showing the counts and rates for the indicators included in each vulnerability assessment are provided on the following pages. Counts for indicators from the County Health Rankings and the American Community Survey are not provided because they are estimates and not counts of actual events.

Counties identified as vulnerable to rapid dissemination of HIV/HCV among PWID by the National Vulnerability Assessment are indicated with an asterisk (*) behind the county name.

Counts of 1-4 for indicators that represent data on individuals are suppressed for privacy reasons. These cells are shaded in black. Rates based on counts of 1-19 are considered unreliable and are shaded in gray.

These data are also available in a Microsoft Excel workbook available at https://health.mo.gov/data/opioids/assessments.php to allow for sorting and filtering of the results.

Missouri Opioid Overdose Vulnerability Assessment Indicators – 2022: Counts and Rates

	Opioid Overdose Vulnerability Assessment Indicators – 2022															
	Individual Outcomes											Community Factors				
County	Count: Drug OD Deaths by Residence County	Rate: Drug OD Deaths by Residence County	Count: Drug OD Deaths by County of Record	Rate: Drug OD Deaths by County of Record	Count: Opioid Misuse ER Visits	Rate: Opioid Misuse ER Visits	Count: Opioid-related SUDT	Rate: Opioid-related SUDT	Count: Drug-related Arrests	Rate: Drug-related Arrests	Rate: Poor Mental Health Days	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured
Adair	7	9.2	8	10.5	150	1.97	45	59.1	18	70.9	4.9	9.9	$41,929	23.8	5.7	7.0
Andrew	5	9.5	5	9.5	170	3.21	19	36.0	75	426.5	4.6	8.3	$58,772	7.9	3.0	5.1
Atchison		0.0		0.0	8	0.52	0	0.0	13	255.1	4.6	8.5	$50,236	12.1	2.5	7.5
Audrain		7.9		5.3	164	2.17	60	80.5	134	539.6	5.1	13.8	$44,261	15.1	4.6	7.9
Barry	12	11.2		3.7	250	2.33	76	70.7	108	301.5	5.0	16.4	$44,403	21.1	4.6	10.7
Barton		5.7		8.5	61	1.74	26	74.8	17	146.7	5.1	12.8	$44,125	20.3	7.1	8.8
Bates*	12	24.6	9	18.5	128	2.63	23	47.2	29	178.5	4.9	12.6	$47,625	12.0	4.5	7.3
Benton	13	22.3	11	18.9	104	1.78	55	93.4	63	321.0	5.1	15.5	$40,249	17.7	8.0	8.9
Bollinger		13.7		8.2	34	0.93	32	88.1	16	132.1	5.3	20.2	$44,158	15.2	4.0	9.6
Boone	98	18.0	113	20.8	1544	2.84	514	93.6	761	415.9	4.5	5.5	$55,328	17.9	4.2	5.7
Buchanan	55	21.0	53	20.2	1499	5.71	330	127.1	345	398.7	5.0	11.7	$51,916	17.2	4.6	8.7
Butler	43	33.8	46	36.1	601	4.72	289	228.4	67	158.9	5.3	17.0	$39,915	23.7	7.9	9.7
Caldwell		11.0		11.0	33	1.21	7	25.8	27	298.3	5.1	10.2	$49,839	15.9	3.2	7.8
Callaway	23	17.1	19	14.1	401	2.98	98	72.8	381	848.8	4.6	13.8	$56,938	10.6	3.3	7.0
Camden	23	16.6	28	20.2	217	1.57	117	84.0	132	284.4	4.7	9.6	$53,478	14.8	4.7	10.3
Cape Girardeau	59	24.9	61	25.7	415	1.75	374	156.8	357	449.0	4.5	9.0	$53,732	16.4	4.5	6.4
Carroll		19.2		15.4	67	2.58	11	42.9		46.8	4.9	14.2	$50,830	14.5	6.7	7.6

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Shading: Rates based on counts of 1 to 19 are considered unreliable and are shaded in gray. Counts of 1 to 4 are suppressed due to confidentiality concerns and are shaded in black.

ER = Emergency Room; OD = Overdose; SUDT = Substance Use Disorder Treatment

See Appendix C for information on data years, data sources, etc.

County	Individual Outcomes											Community Factors				
	Count: Drug OD Deaths by Residence County	Rate: Drug OD Deaths by Residence County	Count: Drug OD Deaths by County of Record	Rate: Drug OD Deaths by County of Record	Count: Opioid Misuse ER Visits	Rate: Opioid Misuse ER Visits	Count: Opioid-related SUDT	Rate: Opioid-related SUDT	Count: Drug-related Arrests	Rate: Drug-related Arrests	Rate: Poor Mental Health Days	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured
Carter	■	16.6	■	5.5	49	2.72	5	27.8		66.8	5.2	15.2	$39,530	13.4	4.2	14.4
Cass	49	15.4	43	13.5	613	1.93	145	45.3	247	231.3	4.5	7.6	$69,433	9.0	3.8	5.9
Cedar*	■	14.0	■	7.0	90	2.10	35	81.5	35	244.4	5.2	12.3	$39,365	15.8	7.0	11.7
Chariton		4.5		4.5	■	1.53		18.1		54.3	4.8	9.3	$46,738	14.0	3.4	7.3
Christian	38	14.3	26	9.8	637	2.39	121	44.5	64	70.6	4.6	8.0	$60,645	10.0	3.4	6.4
Clark	■	4.9	■	9.8	11	0.54	10	48.8	27	395.3	5.0	13.7	$48,909	15.0	3.4	11.1
Clay	119	15.9	125	16.7	1882	2.51	369	48.5	426	168.1	4.2	6.7	$70,510	8.2	3.9	6.1
Clinton		6.5		6.5	78	1.27	32	51.9	26	126.5	4.7	8.0	$62,701	8.9	4.3	5.9
Cole	34	14.8	35	15.2	463	2.02	231	101.1	531	696.9	4.4	7.7	$60,066	10.3	3.6	6.3
Cooper	■	5.7	■	7.6	83	1.58	17	33.1	55	321.6	4.7	11.3	$52,735	12.1	4.2	7.5
Crawford*	22	30.7	23	32.1	369	5.15	177	248.5	157	661.4	5.5	22.1	$44,438	18.5	9.7	13.7
Dade	■	17.6	■	0.0	51	2.25	22	96.9	7	92.5	5.2	12.8	$40,399	21.5	9.9	11.4
Dallas	■	13.8	■	5.9	90	1.77	25	48.4	5	29.0	5.2	16.6	$43,542	13.4	3.5	11.0
Daviess	■	4.0	■	4.0	25	1.01	9	36.2		36.2	5.0	15.0	$51,679	14.5	2.7	11.4
DeKalb	■	13.8	■	11.1	73	2.02	7	21.3		36.5	4.8	12.7	$55,918	12.2	2.2	5.6
Dent	19	40.9	21	45.2	163	3.51	98	211.0	61	394.0	5.3	16.8	$42,100	22.4	5.4	12.2
Douglas	■	7.5	■	5.0	78	1.95	16	40.0	33	247.3	5.4	17.9	$37,425	20.4	5.8	12.3
Dunklin	14	16.0	9	10.3	144	1.65	63	72.7	161	557.5	5.7	23.7	$36,380	25.7	6.8	12.6

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ER = Emergency Room; OD = Overdose; SUDT = Substance Use Disorder Treatment

See Appendix C for information on data years, data sources, etc.

Opioid Overdose Vulnerability Assessment Indicators – 2022

County	Count: Drug OD Deaths by Residence County	Rate: Drug OD Deaths by Residence County	Count: Drug OD Deaths by County of Record	Rate: Drug OD Deaths by County of Record	Count: Opioid Misuse ER Visits	Rate: Opioid Misuse ER Visits	Count: Opioid-related SUDT	Rate: Opioid-related SUDT	Count: Drug-related Arrests	Rate: Drug-related Arrests	Rate: Poor Mental Health Days	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured
Franklin	143	45.8	125	40.1	1621	5.19	520	165.9	221	211.5	4.5	11.6	$57,214	10.5	4.4	6.6
Gasconade	18	40.9	16	36.4	132	3.00	41	93.8	39	267.7	4.8	12.2	$54,885	9.0	2.7	5.7
Gentry		10.2		10.2	46	2.34	7	36.0	0	0.0	5.0	10.8	$47,790	14.8	3.8	8.0
Greene	242	27.5	295	33.5	3,839	4.36	1208	136.5	767	260.0	4.9	8.2	$46,086	16.4	3.8	8.6
Grundy		13.6		13.6	54	1.84	22	76.4	5	52.1	4.8	13.5	$45,594	17.3	3.3	13.4
Harrison		4.0		0.0	44	1.75	8	32.0	5	60.1	5.1	11.8	$42,917	16.5	4.0	8.8
Henry	11	16.7	8	12.2	117	1.78	62	93.6	7	31.7	5.1	12.2	$45,795	21.1	6.0	9.3
Hickory*	5	17.5		14.0	41	1.43	11	38.3	31	323.4	5.3	15.7	$34,182	17.3	6.4	10.3
Holt	0	0.0	0	0.0	37	2.84	5	39.4		94.5	4.7	8.9	$49,524	10.1	3.3	6.0
Howard		10.0		3.3	30	1.00	7	23.3		20.0	4.9	12.1	$52,700	14.1	4.4	6.1
Howell	12	10.0	13	10.8	288	2.39	159	131.6	98	243.4	5.2	13.0	$38,357	22.3	4.1	11.3
Iron*	8	26.3	6	19.7	138	4.54	36	118.8		29.7	5.4	18.5	$37,435	22.3	6.4	10.1
Jackson	458	21.7	492	23.3	5,139	2.44	1652	78.0	1,539	218.0	4.8	9.4	$55,134	14.7	4.4	8.7
Jasper	51	14.0	37	10.2	1035	2.85	459	125.8	307	252.4	5.0	13.3	$48,357	17.1	5.3	10.7
Jefferson	335	49.6	272	40.2	2,703	4.00	1122	165.1	596	263.1	4.8	10.9	$65,454	9.6	5.3	6.5
Johnson	12	7.4	8	4.9	178	1.10	59	36.3	231	426.0	4.4	7.5	$55,273	14.5	4.8	7.6
Knox		8.4		0.0		0.93		33.8	0	0.0	4.9	13.1	$40,000	18.8	6.9	14.8
Laclede	32	29.8	30	28.0	258	2.40	88	81.7	108	300.9	5.0	14.8	$47,257	15.0	6.4	8.6
Lafayette	14	14.2	10	10.2	203	2.06	43	43.4	109	330.2	4.7	9.4	$58,766	12.6	2.8	7.4
Lawrence	15	13.1	13	11.3	310	2.70	79	69.0	59	154.6	5.1	15.3	$44,742	16.8	6.1	10.4

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Shading: Rates based on counts of 1 to 19 are considered unreliable and are shaded in gray. Counts of 1 to 4 are suppressed due to confidentiality concerns and are shaded in black.

ER = Emergency Room; OD = Overdose; SUDT = Substance Use Disorder Treatment

See Appendix C for information on data years, data sources, etc.

Opioid Overdose Vulnerability Assessment Indicators – 2022

County	Individual Outcomes											Community Factors				
	Count: Drug OD Deaths by Residence County	Rate: Drug OD Deaths by Residence County	Count: Drug OD Deaths by County of Record	Rate: Drug OD Deaths by County of Record	Count: Opioid Misuse ER Visits	Rate: Opioid Misuse ER Visits	Count: Opioid-related SUDT	Rate: Opioid-related SUDT	Count: Drug-related Arrests	Rate: Drug-related Arrests	Rate: Poor Mental Health Days	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured
Lewis		10.2		6.8		0.24	10	34	41	417.90	4.9	11.5	$45,988	18.6	2.8	7.8
Lincoln	67	37.9	49	27.7	705	3.99	241	133.6	39	64.9	4.9	10.5	$64,196	11	3.8	6.3
Linn		8.4		5.6	61	1.7	33	93	79	667.80	4.9	10.6	$45,930	15.4	1.9	7.6
Livingston	8	17.9	7	15.6	74	1.65	13	30.1	69	478.7	5.1	13.3	$46,992	16.2	1.9	8.8
Macon		2.2		0	48	1.06	17	37.5	30	198.7	4.8	11.8	$42,746	12.8	5.2	8.3
Madison*	10	27.5	9	24.7	106	2.91	34	93.6	25	206.4	5.1	15.6	$43,636	14.2	4.3	8.1
Maries	11	41.9		34.3	32	1.22	32	121.3	33	375.2	5	13.5	$47,569	17	6	9.2
Marion	17	19.9	15	17.5	135	1.58	93	109.1	323	1,136.40	4.9	12	$48,784	17.3	4.6	6.9
McDonald	10	14.5	8	11.6	128	1.86	31	45.1	14	61.1	5.2	22.4	$41,643	18.6	4.2	14.6
Mercer	0	0	0	0	12	1.11	7	65.6		0	4.8	11.6	$47,298	10.1	2.5	11.2
Miller	10	13		10.4	119	1.55	52	67.2	28	108.60	4.9	12.7	$47,171	16.9	4.9	8.5
Mississippi	5	12.8	6	15.3	137	3.49	60	157.6	47	370.30	5.4	24.3	$35,357	25.3	8.9	12.8
Moniteau	5	10.5		8.4	45	0.94	14	29.9	0	0	4.8	14.6	$58,010	12	4.3	10.6
Monroe		11.5		3.8	47	1.81	7	26.9	13	149.9	4.9	10.7	$43,966	13.5	2.3	6.9
Montgomery	9	26.2		20.4	99	2.88	21	62	30	265.6	5.2	14.8	$46,757	16.3	3.8	7.4
Morgan	6	9.7		6.5	95	1.54	23	37	24	115.9	5.4	21.9	$39,003	23.3	4.1	15.5
New Madrid	12	23.5	8	15.7	120	2.35	32	63.9	52	311.50	5.4	21.3	$38,679	22.2	6.4	12.3
Newton	29	16.6	40	22.9	288	1.65	107	61	244	417.4	5.1	12.9	$50,813	13.5	3.8	9.7
Nodaway		1.5		1.5	105	1.59	19	29.1	76	349.5	4.8	7.7	$44,232	22	2.9	7.7
Oregon		3.2		0	59	1.87	15	48		28.8	5.4	16.9	$33,601	23.8	3.5	14.1

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ER = Emergency Room; OD = Overdose; SUDT = Substance Use Disorder Treatment

See Appendix C for information on data years, data sources, etc.

Opioid Overdose Vulnerability Assessment Indicators – 2022

County	Individual Outcomes											Community Factors				
	Count: Drug OD Deaths by Residence County	Rate: Drug OD Deaths by Residence County	Count: Drug OD Deaths by County of Record	Rate: Drug OD Deaths by County of Record	Count: Opioid Misuse ER Visits	Rate: Opioid Misuse ER Visits	Count: Opioid-related SUDT	Rate: Opioid-related SUDT	Count: Drug-related Arrests	Rate: Drug-related Arrests	Rate: Poor Mental Health Days	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured
Osage	■	12.2	■	7.3	35	0.86	19	46.8	10	73.9	4.5	10.1	$61,687	7.4	2.0	3.5
Ozark*	■	11.0	■	3.7	27	0.99	13	47.7		44.0	5.5	17.7	$31,947	29.6	5.6	12.4
Pemiscot	■	14.7	9	18.9	76	1.59	24	51.3	61	391.0	5.7	22.2	$33,859	27.4	7.9	11.1
Perry	12	20.9	11	19.1	87	1.51	68	118.1	155	807.5	4.8	12.3	$55,863	7.4	3.9	5.2
Pettis	15	11.8	13	10.2	199	1.56	91	71.4	246	579.0	4.9	13.5	$46,157	16.4	6.0	11.2
Phelps	55	41.1	52	38.9	526	3.93	241	180.9	260	585.4	4.8	11.7	$44,154	20.6	5.2	6.6
Pike	14	25.8	14	25.8	97	1.78	30	57.0	30	170.9	4.8	15.8	$46,385	15.1	4.9	7.2
Platte	42	13.4	43	13.7	484	1.54	91	28.5	195	183.0	3.9	4.2	$80,393	6.2	3.8	4.5
Polk	16	16.5	15	15.5	268	2.77	77	79.0	49	150.8	4.9	11.6	$45,660	16.5	3.8	10.2
Pulaski	66	42.0	64	40.7	426	2.71	189	119.5	78	148.0	4.4	7.2	$53,492	15.1	6.0	8.4
Putnam		14.1		7.1	■	2.62	8	56.9	0	0.0	4.9	9.5	$42,849	17.0	2.5	11.2
Ralls	■	13.0	■	3.2	40	1.30	13	42.1	24	233.0	4.8	10.3	$55,377	13.7	4.7	5.7
Randolph	■	10.8	■	6.8	175	2.37	54	73.7	103	422.0	5.0	13.1	$47,740	16.4	5.4	7.4
Ray	7	10.2	5	7.3	202	2.94	45	65.5	15	65.5	4.8	11.9	$61,957	11.9	3.6	8.1
Reynolds*	■	10.7	■	5.3	49	2.62		21.5	0	0.0	5.3	20.2	$40,324	19.4	5.5	9.7
Ripley*		5.0		5.0	119	2.98	47	117.8	40	300.8	5.7	20.1	$34,971	25.4	5.8	10.9
Saline	7	10.2	7	10.2	100	1.46	21	30.6	69	301.9	4.9	16.0	$44,720	16.2	3.4	7.2
Schuyler	■	7.3		7.3	16	1.16		7.4		66.2	5.2	12.4	$42,694	17.8	3.9	12.0
Scotland		13.6	■	0.0	16	1.09		6.8	0	0.0	5.4	20.1	$50,085	13.3	3.6	22.8
Scott	16	13.9	17	14.8	328	2.85	182	158.4	256	668.6	5.1	15.0	$44,139	19.8	4.4	10.0

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ER = Emergency Room; OD = Overdose; SUDT = Substance Use Disorder Treatment

See Appendix C for information on data years, data sources, etc.

Opioid Overdose Vulnerability Assessment Indicators – 2022

County	Individual Outcomes											Community Factors				
	Count: Drug OD Deaths by Residence County	Rate: Drug OD Deaths by Residence County	Count: Drug OD Deaths by County of Record	Rate: Drug OD Deaths by County of Record	Count: Opioid Misuse ER Visits	Rate: Opioid Misuse ER Visits	Count: Opioid-related SUDT	Rate: Opioid-related SUDT	Count: Drug-related Arrests	Rate: Drug-related Arrests	Rate: Poor Mental Health Days	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured
Shannon	█	4.1	█	0.0	40	1.63	19	77.2	0	0.0	5.6	20.0	$34,265	27.5	6.1	15.5
Shelby	█	11.2	█	0.0	20	1.12	8	45.1	31	523.7	5.0	9.3	$44,083	16.2	2.1	8.4
St. Charles	330	27.3	321	26.6	3,918	3.24	983	80.7	1,491	367.1	4.2	5.2	$84,978	5.2	2.9	3.5
St. Clair	█	3.5		7.0	42	1.47	29	99.8	40	412.8	5.2	15.5	$38,870	17.1	3.8	9.4
St. Francois*	71	35.4	65	32.4	1216	6.07	401	201.0	185	278.3	5.1	15.2	$46,466	15.5	5.0	7.5
St. Louis	1092	36.6	1042	34.9	12,258	4.11	3,815	127.9	3,880	390.3	4.3	6.5	$67,420	9.7	4.7	4.9
St. Louis City	768	85.2	1083	120.2	9,323	10.35	4,823	540.1	1,133	380.7	5.0	12.2	$43,896	21.8	7.0	8.9
Ste. Genevieve	17	31.7	13	24.2	141	2.63	66	122.7	40	223.2	4.9	10.6	$60,129	11.5	3.5	4.2
Stoddard	13	14.9	15	17.2	189	2.17	102	117.2	137	472.4	5.1	19.1	$41,062	18.2	5.5	9.1
Stone	23	23.9	15	15.6	351	3.65	81	83.2	93	286.5	5.0	12.8	$49,656	12.9	6.4	7.6
Sullivan	█	27.3	█	27.3	36	1.96	13	71.8		66.3	4.9	15.7	$46,481	16.9	2.0	10.2
Taney	34	20.3	35	20.8	852	5.07	277	164.6	112	199.6	4.9	11.1	$46,031	14.7	4.8	12.4
Texas	22	28.9	18	23.7	149	1.96	65	86.3	73	290.7	5.3	16.4	$35,067	25.3	7.5	11.6
Vernon	10	16.3	10	16.3	79	1.28	55	89.9	47	230.5	5.0	11.7	$43,276	14.8	4.3	11.3
Warren	39	36.5	28	26.2	498	4.66	127	115.7	144	393.5	4.7	11.3	$60,125	13.4	4.5	5.9
Washington*	28	37.7	20	26.9	369	4.97	92	124.6	166	674.7	5.4	23.1	$41,483	20.1	7.3	10.5
Wayne*	7	18.1		5.2	90	2.32	51	133.1	105	822.3	5.5	23.8	$34,316	24.1	6.5	11.4
Webster	28	23.6	19	16.0	337	2.84	68	56.9	97	243.4	5.2	13.9	$50,560	17.8	4.5	10.3
Worth	█	0.0	0	0.0	█	2.66		17.1	0	0.0	4.8	10.2	$53,580	13.7	3.7	5.3
Wright*	8	14.5	█	3.6	122	2.22	54	98.2	104	567.5	5.5	19.6	$34,776	24.2	7.5	13.7

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See Appendix C for information on data years, data sources, etc.

Missouri Bloodborne Infection Vulnerability Assessment Indicators – 2022: Counts and Rates

	Bloodborne Infection Vulnerability Assessment Indicators – 2022																		
	Individual Outcomes														Community Factors				
County	Count: Drug OD Deaths by Residence County	Rate: Drug OD Deaths by Residence County	Count: Drug OD Deaths by County of Record	Rate: Drug OD Deaths by County of Record	Count: HIV, HBV, HCV	Rate: HIV, HBV, HCV	Count: HCV Among Ages 18 to 40	Rate: HCV Among Ages 18 to 40	Count: Opioid Misuse ER Visits	Rate: Opioid Misuse ER Visits	Count: IDU Among SUDT Recipients	Rate: IDU Among SUDT Recipients	Count: Drug-related Arrests	Rate: Drug-related Arrests	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured
Adair	7	9.2	8	10.5	27	35.5	16	142.9	150	1.97	128	168.0	18	70.9	9.9	$41,929	23.8	5.7	7.0
Andrew	5	9.5	5	9.5	33	62.4	13	281.7	170	3.21	38	72.0	75	426.5	8.3	$58,772	7.9	3.0	5.1
Atchison		0.0		0.0	6	38.9		259.3	8	0.52		13.1	13	255.1	8.5	$50,236	12.1	2.5	7.5
Audrain		7.9		5.3	246	325.0	153	2,093.3	164	2.17	78	104.7	134	539.6	13.8	$44,261	15.1	4.6	7.9
Barry	12	11.2		3.7	108	100.5	36	405.7	250	2.33	147	136.8	108	301.5	16.4	$44,403	21.1	4.6	10.7
Barton		5.7		8.5	31	88.2	12	403.4	61	1.74	36	103.5	17	146.7	12.8	$44,125	20.3	7.1	8.8
Bates*	12	24.6	9	18.5	25	51.3	10	237.1	128	2.63	60	123.1	29	178.5	12.6	$47,625	12.0	4.5	7.3
Benton	13	22.3	11	18.9	52	89.1	11	302.6	104	1.78	90	152.9	63	321.0	15.5	$40,249	17.7	8.0	8.9
Bollinger		13.7		8.2	21	57.7	8	269.7	34	0.93	23	63.3	16	132.1	20.2	$44,158	15.2	4.0	9.6
Boone	98	18.0	113	20.8	347	63.9	108	144.2	1544	2.84	546	99.5	761	415.9	5.5	$55,328	17.9	4.2	5.7
Buchanan	55	21.0	53	20.2	588	224.0	307	1,134.3	1499	5.71	544	209.6	345	398.7	11.7	$51,916	17.2	4.6	8.7
Butler	43	33.8	46	36.1	157	123.3	66	567.0	601	4.72	281	222.1	67	158.9	17.0	$39,915	23.7	7.9	9.7
Caldwell		11.0		11.0	13	47.8		43.5	33	1.21	14	51.6	27	298.3	10.2	$49,839	15.9	3.2	7.8
Callaway	23	17.1	19	14.1	540	401.4	338	2,412.7	401	2.98	141	104.7	381	848.8	13.8	$56,938	10.6	3.3	7.0
Camden	23	16.6	28	20.2	83	59.9	33	347.4	217	1.57	173	124.2	132	284.4	9.6	$53,478	14.8	4.7	10.3
Cape Girardeau	59	24.9	61	25.7	134	56.5	64	240.1	415	1.75	347	145.5	357	449.0	9.0	$53,732	16.4	4.5	6.4
Carroll		19.2		15.4	10	38.5		139.5	67	2.58	16	62.3		46.8	14.2	$50,830	14.5	6.7	7.6

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See Appendix C for information on data years, data sources, etc.

Bloodborne Infection Vulnerability Assessment Indicators – 2022

County	Individual Outcomes														Community Factors				
	Count: Drug OD Deaths by Residence County	Rate: Drug OD Deaths by Residence County	Count: Drug OD Deaths by County of Record	Rate: Drug OD Deaths by County of Record	Count: HIV, HBV, HCV	Rate: HIV, HBV, HCV	Count: HCV Among Ages 18 to 40	Rate: HCV Among Ages 18 to 40	Count: Opioid Misuse ER Visits	Rate: Opioid Misuse ER Visits	Count: IDU Among SUDT Recipients	Rate: IDU Among SUDT Recipients	Count: Drug-related Arrests	Rate: Drug-related Arrests	Lack of a High School Education	Median Income	Poverty	Unemployment Rate	Uninsured
Carter	■	16.6	■	5.5	22	122.0	8	551.3	49	2.72	14	77.9		66.8	15.2	$39,530	13.4	4.2	14.4
Cass	49	15.4	43	13.5	142	44.7	39	135.8	613	1.93	164	51.2	247	231.3	7.6	$69,433	9.0	3.8	5.9
Cedar*	■	14.0	■	7.0	41	95.7	14	427.7	90	2.10	52	121.0	35	244.4	12.3	$39,365	15.8	7.0	11.7
Chariton		4.5		4.5	■	40.5	■	237.4	■	1.53	10	45.3		54.3	9.3	$46,738	14.0	3.4	7.3
Christian	38	14.3	26	9.8	127	47.7	50	197.4	637	2.39	143	52.6	64	70.6	8.0	$60,645	10.0	3.4	6.4
Clark	■	4.9	■	9.8	5	24.4	■	61.8	11	0.54	14	68.3	27	395.3	13.7	$48,909	15.0	3.4	11.1
Clay	119	15.9	125	16.7	270	36.0	58	74.3	1882	2.51	349	45.9	426	168.1	6.7	$70,510	8.2	3.9	6.1
Clinton		6.5		6.5	18	29.3	8	151.4	78	1.27	39	63.3	26	126.5	8.0	$62,701	8.9	4.3	5.9
Cole	34	14.8	35	15.2	327	142.3	150	650.6	463	2.02	235	102.8	531	696.9	7.7	$60,066	10.3	3.6	6.3
Cooper	■	5.7	■	7.6	132	251.8	74	1,357.8	83	1.58	32	62.4	55	321.6	11.3	$52,735	12.1	4.2	7.5
Crawford*	22	30.7	23	32.1	100	139.6	49	802.0	369	5.15	147	206.4	157	661.4	22.1	$44,438	18.5	9.7	13.7
Dade	■	17.6	■	0.0	21	92.5	9	516.4	51	2.25	29	127.7	7	92.5	12.8	$40,399	21.5	9.9	11.4
Dallas	■	13.8	■	5.9	47	92.4	16	391.8	90	1.77	41	79.4	5	29.0	16.6	$43,542	13.4	3.5	11.0
Daviess	■	4.0	■	4.0	5	20.1	■	100.1	25	1.01	9	36.2		36.2	15.0	$51,679	14.5	2.7	11.4
DeKalb	■	13.8	■	11.1	121	335.0	37	880.1	73	2.02	12	36.5		36.5	12.7	$55,918	12.2	2.2	5.6
Dent	19	40.9	21	45.2	40	86.0	16	427.2	163	3.51	77	165.8	61	394.0	16.8	$42,100	22.4	5.4	12.2
Douglas	■	7.5	■	5.0	26	65.2	9	312.1	78	1.95	34	84.9	33	247.3	17.9	$37,425	20.4	5.8	12.3
Dunklin	14	16.0	9	10.3	83	94.9	25	333.5	144	1.65	100	115.4	161	557.5	23.7	$36,380	25.7	6.8	12.6

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County	Count: Drug OD Deaths by Residence County	Rate: Drug OD Deaths by Residence County	Count: Drug OD Deaths by County of Record	Rate: Drug OD Deaths by County of Record	Count: HIV, HBV, HCV	Rate: HIV, HBV, HCV	Count: HCV Among Ages 18 to 40	Rate: HCV Among Ages 18 to 40	Count: Opioid Misuse ER Visits	Rate: Opioid Misuse ER Visits	Count: IDU Among SUDT Recipients	Rate: IDU Among SUDT Recipients	Count: Drug-related Arrests	Rate: Drug-related Arrests	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured
								Individual Outcomes								Community Factors			
Franklin	143	45.8	125	40.1	202	64.7	111	396.8	1621	5.19	373	119.0	221	211.5	11.6	$57,214	10.5	4.4	6.6
Gasconade	18	40.9	16	36.4	31	70.5	19	532.8	132	3.00	42	96.1	39	267.7	12.2	$54,885	9.0	2.7	5.7
Gentry		10.2		10.2	6	30.5		118.0	46	2.34	16	82.3	0	0.0	10.8	$47,790	14.8	3.8	8.0
Greene	242	27.5	295	33.5	1,036	117.7	374	362.4	3,839	4.36	1537	173.7	767	260.0	8.2	$46,086	16.4	3.8	8.6
Grundy		13.6		13.6	24	81.7	7	276.6	54	1.84	45	156.3	5	52.1	13.5	$45,594	17.3	3.3	13.4
Harrison		4.0		0.0	10	39.9		50.3	44	1.75	18	72.1	5	60.1	11.8	$42,917	16.5	4.0	8.8
Henry	11	16.7	8	12.2	60	91.3	23	424.1	117	1.78	111	167.6	7	31.7	12.2	$45,795	21.1	6.0	9.3
Hickory*	5	17.5		14.0	20	69.8		58.9	41	1.43	10	34.8	31	323.4	15.7	$34,182	17.3	6.4	10.3
Holt	0	0.0	0	0.0		30.7		107.3	37	2.84	7	55.1		94.5	8.9	$49,524	10.1	3.3	6.0
Howard		10.0		3.3	15	49.8		100.4	30	1.00	10	33.3		20.0	12.1	$52,700	14.1	4.4	6.1
Howell	12	10.0	13	10.8	152	126.2	57	541.6	288	2.39	213	176.3	98	243.4	13.0	$38,357	22.3	4.1	11.3
Iron*	8	26.3	6	19.7	34	111.8	17	697.9	138	4.54	37	122.1		29.7	18.5	$37,435	22.3	6.4	10.1
Jackson	458	21.7	492	23.3	2,219	105.2	571	254.1	5,139	2.44	1769	83.5	1,539	218.0	9.4	$55,134	14.7	4.4	8.7
Jasper	51	14.0	37	10.2	400	110.0	160	425.6	1035	2.85	553	151.5	307	252.4	13.3	$48,357	17.1	5.3	10.7
Jefferson	335	49.6	272	40.2	451	66.7	227	355.0	2,703	4.00	865	127.3	596	263.1	10.9	$65,454	9.6	5.3	6.5
Johnson	12	7.4	8	4.9	61	37.7	22	98.8	178	1.10	90	55.3	231	426.0	7.5	$55,273	14.5	4.8	7.6
Knox		8.4		0.0		25.3		107.0		0.93	5	42.3	0	0.0	13.1	$40,000	18.8	6.9	14.8
Laclede	32	29.8	30	28.0	89	82.9	47	492.8	258	2.40	218	202.4	108	300.9	14.8	$47,257	15.0	6.4	8.6
Lafayette	14	14.2	10	10.2	31	31.5	10	116.0	203	2.06	67	67.7	109	330.2	9.4	$58,766	12.6	2.8	7.4
Lawrence	15	13.1	13	11.3	81	70.5	38	377.7	310	2.70	129	112.6	59	154.6	15.3	$44,742	16.8	6.1	10.4

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Bloodborne Infection Vulnerability Assessment Indicators – 2022

County	Individual Outcomes														Community Factors				
	Count: Drug OD Deaths by Residence County	Rate: Drug OD Deaths by Residence County	Count: Drug OD Deaths by County of Record	Rate: Drug OD Deaths by County of Record	Count: HIV, HBV, HCV	Rate: HIV, HBV, HCV	Count: HCV Among Ages 18 to 40	Rate: HCV Among Ages 18 to 40	Count: Opioid Misuse ER Visits	Rate: Opioid Misuse ER Visits	Count: IDU Among SUDT Recipients	Rate: IDU Among SUDT Recipients	Count: Drug-related Arrests	Rate: Drug-related Arrests	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured
Lewis	■	10.2	■	6.8	8	27.2	5	171.9	■	0.24	18	61.2	41	417.9	11.5	$45,988	18.6	2.8	7.8
Lincoln	67	37.9	49	27.7	121	68.4	44	250.6	705	3.99	210	116.4	39	64.9	10.5	$64,196	11.0	3.8	6.3
Linn	■	8.4	■	5.6	13	36.3	5	167.6	61	1.70	75	211.3	79	667.8	10.6	$45,930	15.4	1.9	7.6
Livingston	8	17.9	7	15.6	81	180.9	40	887.7	74	1.65	34	78.6	69	478.7	13.3	$46,992	16.2	1.9	8.8
Macon	■	2.2	■	0.0	12	26.5		27.7	48	1.06	37	81.7	30	198.7	11.8	$42,746	12.8	5.2	8.3
Madison*	10	27.5	9	24.7	19	52.2	11	358.4	106	2.91	39	107.3	25	206.4	15.6	$43,636	14.2	4.3	8.1
Maries	11	41.9	■	34.3	22	83.8	9	422.5	32	1.22	43	163.0	33	375.2	13.5	$47,569	17.0	6.0	9.2
Marion	17	19.9	15	17.5	82	95.9	33	401.3	135	1.58	165	193.5	323	1136.4	12.0	$48,784	17.3	4.6	6.9
McDonald	10	14.5	8	11.6	103	149.7	38	617.4	128	1.86	53	77.1	14	61.1	22.4	$41,643	18.6	4.2	14.6
Mercer	0	0.0	0	0.0	■	46.2		116.0	12	1.11	10	93.7	■	0.0	11.6	$47,298	10.1	2.5	11.2
Miller	10	13.0	■	10.4	52	67.8	20	297.0	119	1.55	106	137.0	28	108.6	12.7	$47,171	16.9	4.9	8.5
Mississippi	5	12.8	6	15.3	84	214.2	34	864.0	137	3.49	84	220.6	47	370.3	24.3	$35,357	25.3	8.9	12.8
Moniteau	5	10.5		8.4	91	190.2	38	793.7	45	0.94	25	53.5	0	0.0	14.6	$58,010	12.0	4.3	10.6
Monroe	■	11.5	■	3.8	10	38.5	■	152.7	47	1.81	20	76.9	13	149.9	10.7	$43,966	13.5	2.3	6.9
Montgomery	9	26.2	■	20.4	23	66.9	13	460.8	99	2.88	34	100.3	30	265.6	14.8	$46,757	16.3	3.8	7.4
Morgan	6	9.7	■	6.5	39	63.2	12	255.9	95	1.54	32	51.5	24	115.9	21.9	$39,003	23.3	4.1	15.5
New Madrid	12	23.5	8	15.7	28	54.8	7	161.4	120	2.35	39	77.9	52	311.5	21.3	$38,679	22.2	6.4	12.3
Newton	29	16.6	40	22.9	119	68.0	32	203.1	288	1.65	134	76.4	244	417.4	12.9	$50,813	13.5	3.8	9.7
Nodaway	■	1.5	■	1.5	99	149.7	56	557.0	105	1.59	46	70.5	76	349.5	7.7	$44,232	22.0	2.9	7.7
Oregon		3.2	■	0.0	16	50.8	7	295.1	59	1.87	12	38.4		28.8	16.9	$33,601	23.8	3.5	14.1

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ER = Emergency Room; HBV = Hepatitis B Virus; HCV = Hepatitis C Virus; HIV = Human Immunodeficiency Virus; IDU = Injection Drug Use; OD = Overdose; SUDT = Substance Use Disorder Treatment

See Appendix C for information on data years, data sources, etc.

Bloodborne Infection Vulnerability Assessment Indicators – 2022

County	Individual Outcomes														Community Factors				
	Count: Drug OD Deaths by Residence County	Rate: Drug OD Deaths by Residence County	Count: Drug OD Deaths by County of Record	Rate: Drug OD Deaths by County of Record	Count: HIV, HBV, HCV	Rate: HIV, HBV, HCV	Count: HCV Among Ages 18 to 40	Rate: HCV Among Ages 18 to 40	Count: Opioid Misuse ER Visits	Rate: Opioid Misuse ER Visits	Count: IDU Among SUDT Recipients	Rate: IDU Among SUDT Recipients	Count: Drug-related Arrests	Rate: Drug-related Arrests	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured
Osage	■	12.2	■	7.3	9	22.0	■	109.1	35	0.86	18	44.3	10	73.9	10.1	$61,687	7.4	2.0	3.5
Ozark*	■	11.0	■	3.7	23	84.3	9	511.7	27	0.99	14	51.4		44.0	17.7	$31,947	29.6	5.6	12.4
Pemiscot	■	14.7	9	18.9	34	71.3	■	119.0	76	1.59	52	111.1	61	391.0	22.2	$33,859	27.4	7.9	11.1
Perry	12	20.9	11	19.1	34	59.2	19	378.8	87	1.51	78	135.5	155	807.5	12.3	$55,863	7.4	3.9	5.2
Pettis	15	11.8	13	10.2	76	59.7	24	195.6	199	1.56	139	109.0	246	579.0	13.5	$46,157	16.4	6.0	11.2
Phelps	55	41.1	52	38.9	124	92.7	70	448.7	526	3.93	195	146.4	260	585.4	11.7	$44,154	20.6	5.2	6.6
Pike	14	25.8	14	25.8	88	161.9	30	553.4	97	1.78	66	125.3	30	170.9	15.8	$46,385	15.1	4.9	7.2
Platte	42	13.4	43	13.7	82	26.1	18	57.0	484	1.54	78	24.4	195	183.0	4.2	$80,393	6.2	3.8	4.5
Polk	16	16.5	15	15.5	78	80.5	30	305.2	268	2.77	133	136.5	49	150.8	11.6	$45,660	16.5	3.8	10.2
Pulaski	66	42.0	64	40.7	95	60.4	32	126.1	426	2.71	192	121.4	78	148.0	7.2	$53,492	15.1	6.0	8.4
Putnam		14.1		7.1	8	56.6	■	370.7	■	2.62	11	78.2	0	0.0	9.5	$42,849	17.0	2.5	11.2
Ralls	■	13.0	■	3.2	19	61.6	8	334.4	40	1.30	23	74.4	24	233.0	10.3	$55,377	13.7	4.7	5.7
Randolph	■	10.8	■	6.8	153	207.0	74	973.7	175	2.37	112	152.9	103	422.0	13.1	$47,740	16.4	5.4	7.4
Ray	7	10.2	5	7.3	38	55.2	10	168.6	202	2.94	70	101.8	15	65.5	11.9	$61,957	11.9	3.6	8.1
Reynolds*	■	10.7	■	5.3	24	128.2	10	685.4	49	2.62	6	32.3	0	0.0	20.2	$40,324	19.4	5.5	9.7
Ripley*		5.0		5.0	46	115.0	17	516.9	119	2.98	46	115.3	40	300.8	20.1	$34,971	25.4	5.8	10.9
Saline	7	10.2	7	10.2	28	40.9	8	117.5	100	1.46	67	97.7	69	301.9	16.0	$44,720	16.2	3.4	7.2
Schuyler	■	7.3		7.3	■	29.0	■	83.5	16	1.16	8	58.8		66.2	12.4	$42,694	17.8	3.9	12.0
Scotland		13.6	■	0.0		6.8	■	0.0	16	1.09	8	54.7	0	0.0	20.1	$50,085	13.3	3.6	22.8
Scott	16	13.9	17	14.8	71	61.7	18	171.7	328	2.85	151	131.5	256	668.6	15.0	$44,139	19.8	4.4	10.0

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ER = Emergency Room; HBV = Hepatitis B Virus; HCV = Hepatitis C Virus; HIV = Human Immunodeficiency Virus; IDU = Injection Drug Use; OD = Overdose; SUDT = Substance Use Disorder Treatment

See Appendix C for information on data years, data sources, etc.

Bloodborne Infection Vulnerability Assessment Indicators – 2022

County	Count: Drug OD Deaths by Residence County	Rate: Drug OD Deaths by Residence County	Count: Drug OD Deaths by County of Record	Rate: Drug OD Deaths by County of Record	Count: HIV, HBV, HCV	Rate: HIV, HBV, HCV	Count: HCV Among Ages 18 to 40	Rate: HCV Among Ages 18 to 40	Count: Opioid Misuse ER Visits	Rate: Opioid Misuse ER Visits	Count: IDU Among SUDT Recipients	Rate: IDU Among SUDT Recipients	Count: Drug-related Arrests	Rate: Drug-related Arrests	Lack of a High School Education	Median Income	Poverty	Unemployment	Uninsured
Individual Outcomes															**Community Factors**				
Shannon	■	4.1	■	0.0	28	114.0	10	522.7	40	1.63	21	85.3	0	0.0	20.0	$34,265	27.5	6.1	15.5
Shelby	■	11.2	■	0.0	6	33.5	■	0.0	20	1.12	16	90.1	31	523.7	9.3	$44,083	16.2	2.1	8.4
St. Charles	330	27.3	321	26.6	434	35.9	180	150.7	3,918	3.24	701	57.5	1,491	367.1	5.2	$84,978	5.2	2.9	3.5
St. Clair	■	3.5		7.0	24	84.3	■	299.4	42	1.47	36	123.9	40	412.8	15.5	$38,870	17.1	3.8	9.4
St. Francois*	71	35.4	65	32.4	780	389.2	458	2,186.4	1216	6.07	374	187.5	185	278.3	15.2	$46,466	15.5	5.0	7.5
St. Louis	1092	36.6	1042	34.9	1,840	61.6	523	182.0	12,258	4.11	1734	58.1	3,880	390.3	6.5	$67,420	9.7	4.7	4.9
St. Louis City	768	85.2	1083	120.2	1,734	192.4	532	466.4	9,323	10.35	2270	254.2	1,133	380.7	12.2	$43,896	21.8	7.0	8.9
Ste. Genevieve	17	31.7	13	24.2	30	55.9	17	379.2	141	2.63	70	130.2	40	223.2	10.6	$60,129	11.5	3.5	4.2
Stoddard	13	14.9	15	17.2	54	61.9	18	231.6	189	2.17	102	117.2	137	472.4	19.1	$41,062	18.2	5.5	9.1
Stone	23	23.9	15	15.6	85	88.4	37	608.2	351	3.65	134	137.6	93	286.5	12.8	$49,656	12.9	6.4	7.6
Sullivan	■	27.3	■	27.3	7	38.2	■	0.0	36	1.96	17	93.9		66.3	15.7	$46,481	16.9	2.0	10.2
Taney	34	20.3	35	20.8	205	122.1	98	639.2	852	5.07	406	241.2	112	199.6	11.1	$46,031	14.7	4.8	12.4
Texas	22	28.9	18	23.7	134	176.1	60	899.0	149	1.96	62	82.3	73	290.7	16.4	$35,067	25.3	7.5	11.6
Vernon	10	16.3	10	16.3	51	83.0	23	422.3	79	1.28	158	258.3	47	230.5	11.7	$43,276	14.8	4.3	11.3
Warren	39	36.5	28	26.2	74	69.2	34	358.7	498	4.66	109	99.3	144	393.5	11.3	$60,125	13.4	4.5	5.9
Washington*	28	37.7	20	26.9	134	180.4	63	958.2	369	4.97	81	109.7	166	674.7	23.1	$41,483	20.1	7.3	10.5
Wayne*	7	18.1		5.2	33	85.1	19	667.4	90	2.32	51	133.1	105	822.3	23.8	$34,316	24.1	6.5	11.4
Webster	28	23.6	19	16.0	122	102.9	56	513.3	337	2.84	93	77.8	97	243.4	13.9	$50,560	17.8	4.5	10.3
Worth	■	0.0	0	0.0	■	33.3	0	0.0	■	2.66		68.3	0	0.0	10.2	$53,580	13.7	3.7	5.3
Wright*	8	14.5	■	3.6	34	61.8	11	242.3	122	2.22	103	187.4	104	567.5	19.6	$34,776	24.2	7.5	13.7

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See Appendix C for information on data years, data sources, etc.

Appendix C – Data Sources and Notes for the Vulnerability Assessment Indicators

The following pages provide information on the data sources for each indicator utilized in the vulnerability assessments. Additional notes on the indicators are also provided. The indicators in each category are listed below, and the *italicized* text within brackets ([]) next to each indicator notes whether the indicator was included in the opioid overdose assessment, the bloodborne infection assessment, or both assessments.

Individual Outcome Indicators

- Drug Overdose Deaths†‡ – [*Both Assessments*].
- Opioid Misuse Emergency Room (ER) Visits – [*Both Assessments*].
- Opioid-related Substance Use Disorder Treatment (SUDT) Admissions – [*Opioid Overdose Assessment*].
- Drug-related Arrests – [*Both Assessments*].
- Poor Mental Health Days – [*Opioid Overdose Assessment*].
- Bloodborne Illnesses (HIV, Acute and Chronic Hepatitis B, and Acute and Chronic Hepatitis C) – [*Bloodborne Infection Assessment*].
- Hepatitis C Among Ages 18 to 40 – [*Bloodborne Infection Assessment*].
- Injection Drug Use (IDU) Among Persons Receiving Substance Use Disorder Treatment (SUDT) – [*Bloodborne Infection Assessment*].

Community Factor Indicators

- Lack of a High School Education† – [*Both Assessments*].
- Median Income†‡ – [*Both Assessments*].
- Poverty† – [*Both Assessments*].
- Unemployment†‡ – [*Both Assessments*].
- Uninsured† – [*Both Assessments*].

For additional questions regarding definitions, etc., please consult the data source.

† These indicators were considered for the National Vulnerability Assessment.
‡ Analysis completed for the National Vulnerability Assessment found these indicators to be more strongly associated with acute hepatitis C virus infection, which was considered a proxy for unsafe injection drug use.[21]

Drug Overdose Deaths – [*Both Assessments*]

Drug overdose death rates are used in the opioid overdose assessment as a measure of the direct impact of the opioid epidemic. They are also used in the bloodborne infection assessment because the National Vulnerability Assessment found drug overdose deaths to be one of the variables that best predicted acute HCV infection.

- This indicator includes deaths from all forms of overdoses, not just opioids. Suicides are included. Some counties may have underreported opioid overdose death numbers if specific drugs involved in the death are not listed on coroner/medical examiner reports or death certificates. Some counties do not have the resources to test all overdose deaths for type of drug. In addition, there is a risk of contamination of other, non-opioid drugs with opioids such as fentanyl. Therefore, counties with high overdose rates for other types of drugs could also be at risk of an opioid outbreak due to cross-contamination. Overdose deaths may occur as a result of any form of drug use (e.g., injection, smoking, pill, etc.).

- Death certificates include both county of residence and county of record, which is the location where the individual was pronounced dead and is used as a proxy for location of death. County of residence is more typically used in statistical analyses, but 2019 feedback from stakeholders indicated the need to include death rate information for both county of residence and county of record. Internal workgroup members analyzed the data and found that the death rates by county of residence and county of record were similar for most counties. However, a few counties had much higher death rates based on the county of record. This may indicate that persons are traveling to those areas to use substances and those areas may need to invest in more resources such as first responders, naloxone, etc., in order to provide critical response treatment. However, the county of residence in those situations may also need to provide resources to address substance use, such as prevention, treatment, etc. Thus, both rates are utilized in the assessments to create a Combined Drug Overdose Deaths indicator. The rank for this combined indicator is calculated by ranking the sum of the individual Drug Overdose Deaths by Residence County and Drug Overdose Deaths by County of Record indicators. Using this combined rank allows both the residence county and the county of record to be represented in the assessments while avoiding the double emphasis on deaths that would have occurred if both indicators had been utilized separately.

- Overdose death rates are based on Missouri BHCADD death certificate data. Data from 2018 to 2020 are utilized to reduce small numbers and increase stability. Rates are calculated using population data from 2018-2020 and are reported per 100,000 population.

Opioid Misuse Emergency Room (ER) Visits – [*Both Assessments*]

- Opioid misuse ER visit rates may help indicate where future opioid overdose deaths could occur. However, persons who are revived with naloxone may refuse to be transported to the ER, in which case this indicator would underrepresent the number of opioid overdoses.[22]
- Opioid misuse ER visit rates include all forms of opioid abuse. This indicator is included in the opioid overdose assessment as a measure of the direct impact of the opioid epidemic. Although this indicator includes ER visits from all forms of opioid overdoses, it is also used in the bloodborne infection assessment as a proxy measure for injection drug use.
- Opioid misuse ER visit rates are calculated from BHCADD PAS data from 2018 to 2020 and population data from 2018-2020. They are reported per 1,000 population.

Opioid-related Substance Use Disorder Treatment (SUDT) Admissions – [*Opioid Overdose Assessment*]

- Opioid-related SUDT rates are based on Missouri Department of Mental Health data from July 1, 2018, to June 30, 2021. A data file of opioid-related SUDT counts was obtained from the Missouri Department of Mental Health, Division of Behavioral Health, which makes additional data available at https://dmh.mo.gov/behavioral-health.
- Rates are reported per 100,000 population. Population data from 2020, the most recent year available, were multiplied by three to develop the denominator for the rates. Population data were obtained from the Bureau of Health Care Analysis and Data Dissemination.
- Opioid-related SUDT rates help measure the level at which residents access treatment for opioid-related substance use and may also indicate the level of opioid-related drug use in a particular county. Data are included for all forms of use (e.g., injection, pills, snorting, etc.) For this assessment, this indicator includes the "Analgesic, Except Heroin or Methadone," "Heroin," and "Non-Prescribed Methadone" Primary Substance Problem categories from the Missouri Department of Mental Health, Missouri Behavioral Health Data.

Drug-related Arrests – [*Both Assessments*]

- Drug-related arrest rates help measure the level of drug use and its impact in a particular county. One limitation is that these data are based on the location of the arrest rather than the individual's residence county. This differs from most of the other indicators in these assessments, which are based on county of residence.
- Drug-related arrest rates were calculated using Missouri Department of Mental Health data from July 1, 2020, to June 30, 2021, and population data from 2020 (the most recent population data available at time of publication). They are reported per 100,000 population.

- A data file of drug-related arrests was obtained from the Missouri Department of Mental Health, Division of Behavioral Health, which makes additional data available at https://dmh.mo.gov/behavioral-health. The original source for 2021 arrest data is the federal National Incident-Based Reporting System (NIBRS). The original source for the 2017 arrest data included in the 2020 *Missouri Opioid Overdose and Bloodborne Infection Vulnerability Assessments* was the Uniform Crime Reporting system, which was replaced by the NIBRS. In the NIBRS, arrests by statewide agencies such as the Highway Patrol are listed separately and not included in the county totals.
- For the National Vulnerability Assessment, CDC found drug-related arrests to be highly associated with counties most vulnerable to rapid dissemination of HIV/HCV among PWID.[23]

Poor Mental Health Days [*Opioid Overdose Assessment*]

- "More than one in four adults living with serious mental health problems also has a substance use problem. Substance use problems occur more frequently with certain mental health problems, including depression, anxiety disorders, schizophrenia, [and] personality disorders."[24]
- The 2020 Missouri assessment utilized data on self-reported frequent (>14 per month) poor mental health days that were obtained from the Missouri County-Level Study. In 2016, this survey included the following question: "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?" Possible responses included a Number of days, "None," "Don't know/Not sure," and "Refused."[25] More information on the Missouri County-level Study can be obtained from https://health.mo.gov/data/cls/index.php. The data represented the prevalence estimate of the percent of the adult population reporting greater than 14 poor mental health days per month.[26]
- The Missouri County-Level Study has not been updated since 2016. The 2022 Missouri assessment utilizes the poor mental health days measure from the 2021 County Health Rankings. This measure represents the average number of mentally unhealthy days reported in the past 30 days and is age-adjusted. County Health Rankings developed this measure using 2018 data from the Behavioral Risk Factor Surveillance System (BRFSS). More information on the County Health Rankings can be obtained from https://www.countyhealthrankings.org/.
- "Certain mental disorders are established risk factors for developing a substance use disorder. It is commonly hypothesized that individuals with severe, mild, or even subclinical mental disorders may use drugs as a form of self-medication. Although some drugs may temporarily reduce symptoms of a mental illness, they can also exacerbate symptoms, both acutely and in the long run. For example, evidence suggests that periods of cocaine use may worsen the symptoms of bipolar disorder and contribute to

progression of this illness. When an individual develops a mental illness, associated changes in brain activity may increase the vulnerability for problematic use of substances by enhancing their rewarding effects, reducing awareness of their negative effects, or alleviating the unpleasant symptoms of the mental disorder or the side effects of the medication used to treat it. For example, neuroimaging suggests that [attention-deficit/hyperactivity disorder (ADHD)] is associated with neurobiological changes in brain circuits that are also associated with drug cravings, perhaps partially explaining why patients with substance use disorders report greater cravings when they have comorbid ADHD. Substance use can lead to changes in some of the same brain areas that are disrupted in other mental disorders, such as schizophrenia, anxiety, mood, or impulse-control disorders. Drug use that precedes the first symptoms of a mental illness may produce changes in brain structure and function that kindle an underlying predisposition to develop that mental illness."[27]

Bloodborne Illnesses – [*Bloodborne Infection Assessment*]

- Acute and chronic hepatitis B, acute and chronic hepatitis C, HIV, and AIDS (stage 4 HIV) numbers and rates are combined to create a single indicator due to small cell sizes for many counties. They include years 2018 to 2020.
- The bloodborne illnesses indicator measures the direct impact of the diseases on the county.
- CDC used acute hepatitis C rates as a proxy measure for injection drug use in the National Vulnerability Assessment.[28]
- Numerator data were provided by the DHSS Office of Epidemiology. Data for hepatitis B and C are from the Missouri WebSurv 2020 dataset, while data for HIV and AIDS (stage 4 HIV) are from the eHARS 2020 dataset. Population data are from 2018-2020. Rates are reported per 100,000 population.
- Acute and chronic hepatitis B, acute and chronic hepatitis C, HIV, and AIDS (stage 4 HIV) are reportable conditions under the Missouri Code of State Regulations, 19 CSR 20-20.020, which is available at https://www.sos.mo.gov/cmsimages/adrules/csr/current/19csr/19c20-20.pdf. A list of reportable conditions is also available at https://health.mo.gov/living/healthcondiseases/communicable/communicabledisease/pdf/reportablediseaselist2.pdf.

HCV Among Ages 18 to 40 – [*Bloodborne Infection Assessment*]

- "For the past several years, CDC's annual hepatitis C data have shown the highest rates of new infection among adults under 40."[29] CDC used acute hepatitis C rates as a proxy measure for injection drug use in the National Vulnerability Assessment.[30]
- The population of individuals among ages 18 to 40 known to be infected with HCV is also included in the Bloodborne Illnesses indicator (which includes HIV, acute and

chronic hepatitis B, and acute and chronic hepatitis C among all ages). Members of the internal workgroup discussed the effective double counting of this population in the bloodborne infection assessment with the CDC project team for the vulnerability assessment work as well as staff from BHSH. Both groups agreed that the extra emphasis on this population was warranted. (There were too few cases of HIV and HBV to report these conditions as separate indicators.)

- Numerator data for 2018-2020 were provided by the Office of Epidemiology from the Missouri WebSurv 2020 dataset. Population data are from 2019 (the most recent data available containing the needed population by age categories). Rates are reported per 100,000 population.

Injection Drug Use Among Persons Receiving Substance Use Disorder Treatment (SUDT) – [*Bloodborne Infection Assessment*]

- Data on the number of persons who enter SUDT and report they use injection drugs helps to measure the level of injection drug use activity. It may also help measure the level of drug use in a particular county. It is recognized that this indicator likely captures only a portion, perhaps only a small portion, of the population that engages in injection drug behavior due to limited access to treatment or unwillingness to seek treatment. This measure was used in the bloodborne infection assessment as it is the injection form of drug use that primarily creates a risk for transmission of hepatitis and HIV. This indicator includes all persons who reported injection drug use regardless of the type of drug used (i.e., opioids or other types of drugs).
- Persons who inject drugs and are in SUDT rates are based on Missouri Department of Mental Health data from July 1, 2018, to June 30, 2021. A data file of opioid-related SUDT counts was obtained from the Missouri Department of Mental Health, Division of Behavioral Health, which makes additional data available at https://dmh.mo.gov/behavioral-health.
- Rates are reported per 100,000 population. Population data from 2020, the most recent year available, were multiplied by three to develop the denominator for the rates. Population data were obtained from the Bureau of Health Care Analysis and Data Dissemination.

Lack of a High School Education – [*Both Assessments*]

- "Dropping out of high school has adverse consequences, including negative effects on employment, lifetime earnings, and physical health."[31] Persons who do not graduate from high school reduce their future economic opportunities for both obtaining jobs and earning higher salaries. U.S. Bureau of Labor Statistics data for 2021 show that the 2021 unemployment rate for those with less than a high school diploma was 8.3%, compared to only 6.2% for those with a high school diploma but no further education. The median weekly earnings for a person with a high school diploma but no further education were

$809, compared to $626 for a person with less than a high school diploma.[32] Over decades, "hundreds of studies have documented [that] schooling is linked with better health and longer life."[33]

- Percentages of the population with less than a high school education were obtained from the U.S. Census Bureau, American Community Survey 5-year estimates 2015-2019.

Median Income – [*Both Assessments*]

- Median income represents the mid-point of income in a county. Half of the incomes in the county fall above the median income while the other half fall below it.[34]
- A study by the Health Care Cost Institute found in an analysis of 1,500 counties "that employed adults (over the age of 18) living in counties with lower median incomes had greater rates of long-term opioid use (having filled at least 6 prescriptions for opioids) compared to employed adults in higher income counties… In the lowest median income counties ($30k or less), 4.9% of the employed adult population were long-term opioid users, with some counties having rates as high as 15.8%. In contrast, just 1.3% of the same population in the highest median income counties ($100k or more) were long-term opioid users and the highest rate in these counties was 2.3%."[35]
- Low median income may be, but is not always, correlated with unemployment. People may work full time or more than full time but not receive a wage high enough to cover basic living expenses, particularly in areas where the cost of living is high. A study by the Economic Policy Institute found that in many parts of the nation, median family income is much lower than the amount needed "to attain an adequate – but modest – standard of living."[36] "Low-income counties tend to have much in common. They are largely rural and have relatively weak job markets. They also tend to have low average life expectancies and declining populations."[37]
- In the National Vulnerability Assessment, CDC found mean income to be highly associated with vulnerability to an outbreak of hepatitis C or HIV infection related to injection drugs.[38] The internal workgroup decided to use median income rather than mean, or average, income because a few high incomes in a county may raise the mean income but typically have less impact on median income.
- Median income levels by county were obtained from the U.S. Census Bureau, American Community Survey 5-year estimates 2015-2019.

Poverty – [*Both Assessments*]

- "People living in poverty are less likely to have access to health care, healthy food, stable housing, and opportunities for physical activity. These disparities mean people living in poverty are more likely to die from preventable diseases."[39] Poverty may limit a person's ability to pay for a variety of goods and services related to health, such as fees related to medical visits, healthy foods, and medications. A 2020 review of studies by van Draanen, et al., "found a significant positive association between measures of

poverty and overdose outcomes" and that "overdose rates are higher in low income areas and in situations where people are living in poverty."[40]

- Poverty rates represent the estimated percentage of residents living in poverty.
- Poverty rates by county were obtained from the U.S. Census Bureau, American Community Survey 5-year estimates 2015-2019.

Unemployment – [*Both Assessments*]

- Unemployment may have several negative consequences on general health. "According to a recent study, … people who frequently experienced unemployment in their mid-to-late 20s and early-30s but had little experience of it after the age of 35 had worse physical and mental health by the age of 50… The lack of access to health care when jobless … may help explain some of the results."[41] The lack of access to substance use disorder treatment may be especially detrimental during times of unemployment. "Two linked studies led by UCLA Fielding School of Public Health researchers have found strong associations between drug misuse generally and opioid misuse specifically among unemployed Americans, who were found to have a 40% higher likelihood to misuse opioids than those working 35-40 hours per week."[42]
- For the National Vulnerability Assessment, CDC found unemployment to be an indicator highly associated with vulnerability to an outbreak of hepatitis C related to injection drug use.[43]
- Unemployment rates by county were obtained from the U.S. Census Bureau, American Community Survey 5-year estimates 2015-2019. They are reported as percentages.

Uninsured – [*Both Assessments*]

- "Uninsured adults are far more likely than those with insurance to postpone health care or forgo it altogether. The consequences can be severe, particularly when preventable conditions or chronic diseases go undetected… Studies repeatedly demonstrate that the uninsured are less likely than those with insurance to receive preventive care and services for major health conditions and chronic diseases… [T]hey are more likely to be hospitalized for avoidable health problems and to experience declines in their overall health. When they are hospitalized, uninsured people receive fewer diagnostic and therapeutic services and also have higher mortality rates than those with insurance… High uninsured rates also contribute to rural hospital closures, leaving individuals living in rural areas at an even greater disadvantage to accessing care."[44]
- Uninsured rates represent the estimated percentage of residents under age 65 without health insurance.
- Uninsured rates were obtained from the U.S. Census Bureau, American Community Survey 5-year estimates, 2015-2019.

Endnotes

[1] Van Handel, M, et al. County-level Vulnerability Assessment for Rapid Dissemination of HIV or HCV Infections Among Persons Who Inject Drugs, United States. *Journal of Acquired Immune Deficiency Syndromes*. 2016 Nov 1; 73(3):323-331. Accessed December 9, 2022, from the CDC Stacks website at https://stacks.cdc.gov/view/cdc/46647.

[2] Missouri Department of Health and Senior Services, Bureau of Health Care Analysis and Data Dissemination. Vital Statistics Death data requested. Received December 5, 2022.

[3] Missouri Department of Health and Senior Services, Bureau of Health Care Analysis and Data Dissemination. Patient Abstract System data requested. Received December 5, 2022.

[4] CDC. Persons Who Inject Drugs (PWID)s: Infections Diseases, Opioids and Injection Drug Use. Accessed December 9, 2022, from https://www.cdc.gov/pwid/opioid-use.html.

[5] Matue-Gelabert, P, et al. Hepatitis C Virus Risk Among Young People Who Inject Drugs. *Frontiers in Public Health*. 2022 July 29. Accessed December 9, 2022, from https://www.frontiersin.org/articles/10.3389/fpubh.2022.835836/full.

[6] CDC. Viral Hepatitis: Hepatitis C Questions and Answers for the Public. Accessed December 9, 2022, from https://www.cdc.gov/hepatitis/hcv/cfaq.htm.

[7] Hudson, A, et al. Hepatitis C Infection Preceding an Outbreak of Human Immunodeficiency Virus Among Persons Who Inject Drugs—Kanawha County, West Virginia, 2019-2021. *Clinical Infectious Diseases*. 2022 July 29. Accessed December 9, 2022, from https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciac619/6651445.

[8] Carry, M, et al. Supporting Syringe Services Programs in the Initiation and Scale-up of Vaccine Administration: Findings from In-depth Interviews. *Harm Reduction Journal*. 2022 September 1; 19(100). Accessed December 9, 2022, from https://harmreductionjournal.biomedcentral.com/articles/10.1186/s12954-022-00681-x.

[9] Missouri Department of Health and Senior Services, Bureau of Health Care Analysis and Data Dissemination. Patient Abstract System data requested. Received December 5, 2022.

[10] Van Handel, M, et al. County-level Vulnerability Assessment for Rapid Dissemination of HIV or HCV Infections Among Persons Who Inject Drugs, United States. *Journal of Acquired Immune Deficiency Syndromes*. 2016 November 01; 73(3): 323-331. Accessed December 9, 2022, from the CDC Stacks website at https://stacks.cdc.gov/view/cdc/46647.

[11] CDC. Opioid Funding. Accessed December 9, 2022, from https://www.cdc.gov/cpr/readiness/funding/funding-opioid.htm.

[12] Missouri Department of Health and Senior Services. (2015). Missouri Primary Care Needs Assessment 2015. Accessed December 9, 2022, from https://health.mo.gov/living/families/primarycare/pdf/PrimaryCareNeedsAssessment.pdf.

[13] CDC, Agency for Toxic Substances and Disease Registry (ATSDR). CDC/ATDSR Social Vulnerability Index. Accessed December 9, 2022, from https://www.atsdr.cdc.gov/placeandhealth/svi/index.html.

[14] Van Handel, M, et al. County-level Vulnerability Assessment for Rapid Dissemination of HIV or HCV Infections Among Persons Who Inject Drugs, United States. *Journal of Acquired Immune Deficiency Syndromes*. 2016 November 01; 73(3): 323-331. Accessed December 9, 2022, from the CDC Stacks website at https://stacks.cdc.gov/view/cdc/46647.

[15] Missouri Department of Health and Senior Services. Quintile Rankings. Accessed December 9, 2022, from https://health.mo.gov/data/mica/CDP_MICA/RQuintile.html.

[16] Missouri Department of Health and Senior Services. MOPHIMS: Introduction to Profiles and MICA (Course 1). Accessed December 9, 2022, from https://health.mo.gov/data/mica/MICA/CHAIPTraining.html.

[17] Van Handel, M, et al. County-level Vulnerability Assessment for Rapid Dissemination of HIV or HCV Infections Among Persons Who Inject Drugs, United States. *Journal of Acquired Immune Deficiency Syndromes*. 2016 November 01; 73(3): 323-331. Accessed December 9, 2022, from the CDC Stacks website at https://stacks.cdc.gov/view/cdc/46647.

[18] Van Handel, M, et al. County-level Vulnerability Assessment for Rapid Dissemination of HIV or HCV Infections Among Persons Who Inject Drugs, United States. *Journal of Acquired Immune Deficiency Syndromes*. 2016 November 01; 73(3): 323-331. Accessed December 9, 2022, from the CDC Stacks website at https://stacks.cdc.gov/view/cdc/46647.

[19] Van Handel, M, et al. County-level Vulnerability Assessment for Rapid Dissemination of HIV or HCV Infections Among Persons Who Inject Drugs, United States. *Journal of Acquired Immune Deficiency Syndromes*. 2016 November 01; 73(3): 323-331. Accessed December 9, 2022, from the CDC Stacks website at https://stacks.cdc.gov/view/cdc/46647.

[20] Van Handel, M, et al. County-level Vulnerability Assessment for Rapid Dissemination of HIV or HCV Infections Among Persons Who Inject Drugs, United States. *Journal of Acquired Immune Deficiency Syndromes*. 2016 Nov 1; 73(3):323-331. Accessed December 9, 2022, from the CDC Stacks website at https://stacks.cdc.gov/view/cdc/46647.

[21] Van Handel, M, et al. County-level Vulnerability Assessment for Rapid Dissemination of HIV or HCV Infections Among Persons Who Inject Drugs, United States. *Journal of Acquired Immune*

Deficiency Syndromes. 2016 November 01; 73(3): 323-331. Accessed December 9, 2022, from the CDC Stacks website at https://stacks.cdc.gov/view/cdc/46647.

[22] Casillas, S, et al. Patient-Level and County-Level Trends in Nonfatal Opioid-Involved Overdose Emergency Medical Services Encounters – 491 Counties, United States, January 2018-March 2022. *Morbidity and Mortality Weekly Report (MMWR)*. 2022 August 26; 71(34): 1073-1080. Accessed December 9, 2022 from http://dx.doi.org/10.15585/mmwr.mm7134a1.

[23] Van Handel, M, et al. County-level Vulnerability Assessment for Rapid Dissemination of HIV or HCV Infections Among Persons Who Inject Drugs, United States. *Journal of Acquired Immune Deficiency Syndromes*. 2016 November 01; 73(3): 323-331. Accessed December 9, 2022, from the CDC Stacks website at https://stacks.cdc.gov/view/cdc/46647.

[24] U.S. Department of Health and Human Services. Mental Health and Substance Use Co-Occurring Disorders. Accessed December 9, 2022, from MentalHealth.gov website at https://www.mentalhealth.gov/what-to-look-for/mental-health-substance-use-disorders.

[25] Missouri Department of Health and Senior Services. 2016 Missouri County-level Study Questionnaire. Accessed December 9, 2022, from https://health.mo.gov/data/cls/pdf/2016CountylevelStudyQuestionnaire.pdf.

[26] Missouri Department of Health and Senior Services. Missouri County-Level Study (CLS). Accessed December 9, 2022, from https://health.mo.gov/data/cls/.

[27] National Institute on Drug Abuse (NIDA). Common Comorbidities with Substance Use Disorders Research Report. 2021 August 3. Accessed December 9, 2022, from https://nida.nih.gov/publications/research-reports/common-comorbidities-substance-use-disorders/introduction.

[28] Van Handel, M, et al. County-level Vulnerability Assessment for Rapid Dissemination of HIV or HCV Infections Among Persons Who Inject Drugs, United States. *Journal of Acquired Immune Deficiency Syndromes*. 2016 November 01; 73(3): 323-331. Accessed December 9, 2022, from the CDC Stacks website at https://stacks.cdc.gov/view/cdc/46647.

[29] Centers for Disease Control and Prevention. New CDC Data Reveal Less Than a Third of People Diagnosed with Hepatitis C Receive Timely Treatment for the Deadly, yet Curable, Infection. (August 9, 2022). Accessed September 8, 2022, from https://www.cdc.gov/media/releases/2022/s0809-hepatitis-treatment.html.

[30] Van Handel, M, et al. County-level Vulnerability Assessment for Rapid Dissemination of HIV or HCV Infections Among Persons Who Inject Drugs, United States. *Journal of Acquired Immune Deficiency Syndromes*. 2016 November 01; 73(3): 323-331. Accessed December 9, 2022, from the CDC Stacks website at https://stacks.cdc.gov/view/cdc/46647.

[31] Lee-St. John, T, et al. The Long-Term Impact of Systemic Student support in Elementary School: Reducing High School Dropout. *AERA Open*. 2018 October 2: 4(4). Accessed December 9, 2022, from https://doi.org/10.1177/2332858418799.

[32] U.S. Bureau of Labor Statistics. Employment Projections: Education Pays: Earning and Unemployment Rates by Educational Attainment, 2021. Accessed December 9, 2022, from https://www.bls.gov/emp/chart-unemployment-earnings-education.htm.

[33] Zajacova, A, and Lawrence, E. The Relationship Between Education and Health: Reducing Disparities Through a Contextual Approach. *Annual Review of Public Health*. 2018 April: 39; 273-289. Accessed December 9, 2022, from https://www.annualreviews.org/doi/10.1146/annurev-publhealth-031816-044628.

[34] U.S. Census Bureau. Median Household Income. Accessed December 9, 2022, from https://www.census.gov/quickfacts/fact/note/US/INC110217.

[35] Zhou C, Kennedy K, Hargraves J. Workers in Low Income Counties More Likely to Be Long-term Opioid Users. Published December 20, 2017. Accessed December 9, 2022, from https://www.healthcostinstitute.org/blog/entry/workers-in-low-income-counties-more-likely-to-be-long-term-opioid-users.

[36] Economic Policy Institute. EPI Updates Family Budget Calculator with Data on the Cost of Living in Every County and Major Metropolitan Area. March 6, 2018. Accessed December 9, 2022, from https://www.epi.org/press/epi-updates-family-budget-calculator-with-data-on-the-cost-of-living-in-every-county-and-major-metropolitan-area/.

[37] Stebbins, S. Poorest Counties in the US: A State-by-state Look at Where Median Household Income Is Low. USA Today, Jan 25. 2019. Accessed December 9, 2022, from https://www.usatoday.com/story/money/2019/01/25/poorest-counties-in-the-us-median-household-income/38870175/.

[38] Van Handel, M, et al. County-level Vulnerability Assessment for Rapid Dissemination of HIV or HCV Infections Among Persons Who Inject Drugs, United States. *Journal of Acquired Immune Deficiency Syndromes*. 2016 November 01; 73(3): 323-331. Accessed December 9, 2022, from the CDC Stacks website at https://stacks.cdc.gov/view/cdc/46647.

[39] Healthy People 2030. Reduce the Proportion of People Living in Poverty – SDOH-01. Accessed December 9, 2022, from https://health.gov/healthypeople/objectives-and-data/browse-objectives/economic-stability/reduce-proportion-people-living-poverty-sdoh-01.

[40] van Draanen, J, et al. Socioeconomic Marginalization and Opioid-Related Overdose: A Systematic Review. *Drug and Alcohol Dependence*. 2020 September 1: 214. Accessed December 9, 2022, from 10.1016/j.drugalcdep.2020.108127.

[41] Penn State. Unemployment Can Result in Serious Long-Term Health Implications. *SciTechDaily*. 2022 August 3. Accessed December 9, 2022, from https://scitechdaily.com/unemployment-can-result-in-serious-long-term-health-implications/.

[42] UCLA Fielding School of Public Health. Opioid Addiction Crisis in United States Linked to Poor Working Conditions and Unemployment. 2022 May 23. Accessed December 9, 2022, from https://ph.ucla.edu/news/press-release/2022/may/opioid-addiction-crisis-united-states-linked-poor-working-conditions-and.

[43] Van Handel, M, et al. County-level Vulnerability Assessment for Rapid Dissemination of HIV or HCV Infections Among Persons Who Inject Drugs, United States. *Journal of Acquired Immune Deficiency Syndromes*. 2016 November 01; 73(3): 323-331. Accessed December 9, 2022, from the CDC Stacks website at https://stacks.cdc.gov/view/cdc/46647.

[44] Tolbert, J, et al. Key Facts About the Uninsured Population. 2020 November 6. Accessed December 9, 2022, from https://www.kff.org/uninsured/issue-brief/key-facts-about-the-uninsured-population/.