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RESEARCH BRIEF

Exploring the Geographic Variation of Hepatitis C Screening and Treatment in Ohio

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ABSTRACT

Introduction: The US Preventive Services Taskforce recommends one-time hepatitis C virus (HCV) screening for all adults and periodic screening for high-risk individuals. Though HCV treatments are available with cure rates of about 95%, it is estimated that more than 50% of HCV cases are undiagnosed, and only one-third of HCV patients receive treatment. This research sought to understand the gaps in HCV screening and treatment by examining geographic variation within Ohio.

Methods: Using county-level data from the State of Ohio Integrated Behavioral Health Dashboard, we used geospatial analysis to map the percentage of Medicaid enrollees aged 18-64 years with opioid use disorder (OUD) that were screened and treated for HCV. Health care capacity and other risk factors were also compared by high and low HCV screening and treatment counties.

Results: Our analysis showed geographic disparities for HCV screening and treatment. Southwestern Ohio has significantly higher screening rates compared to northeastern Ohio. High screening counties have significantly more health center testing sites compared to low screening rate counties. Northeastern Ohio had significantly higher rates of HCV treatment despite lower screening rates. High treatment counties were more likely to be in nonmetropolitan areas and have fewer health care resources, including significantly fewer HCV physician specialists and primary care physicians (PCPs).

Conclusion: We found wide disparities across Ohio in screening and treatment for HCV. Removing these disparities is necessary to eliminate HCV. We found that better access to health centers and PCPs may improve screening rates, but were not associated with increased treatment.

Keywords: Hepatitis C virus (HCV); Geographic information system (GIS); Medicaid

INTRODUCTION

The US Preventive Services Taskforce (USPSTF) recommends one-time hepatitis C virus (HCV) screening for all adults and routine periodic screening for individuals with current or past drug use.[1] Treatments are available that can cure more than 95% of people with HCV.[2] The US Department of Health and Human Services National Hepatitis C Elimination Program seeks to eliminate HCV by 2030 by funding expanded screening, prevention, and the treatment of HCV.[3] Despite this initiative, it is estimated that more than 50% of HCV cases are undiagnosed, and approximately 15 000 people die annually in the United States due to the disease.[4]

While HCV cases and mortality rates have decreased over the past few years in Ohio, almost 11 000 acute HCV cases from 2019-2023 were reported by the Ohio Department of Health (ODH).[5] Ohio also has several risk factors contributing to higher rates of HCV, including consistently high rates of opioid use disorder (OUD)[6] and high rates of mortality from injection drug use (IDU),[7] which are important risk factors for HCV.[8] The HCV infection prevalence is also up to 10 times higher among incarcerated populations compared to the general population. Ohio has approximately 45 000 people incarcerated, and recent data showed more than 700 HCV positive diagnoses among state correctional inmates.[9]

Recent research also found that Ohio has among the lowest HCV clearance cascade rates (the steps in curing HCV beginning with screening) in the US, with only about 11% cured.[10] This is consistent with data from the State of Ohio Integrated Behavioral Health Dashboard which reported about 11% of Medicaid enrollees with OUD being treated for HCV in 2021. These same data report only 34% of Medicaid enrollees with OUD being screened for HCV, with 66% testing positive for HCV.[11]

The Ohio Association of Community Health Centers (OACHC) put together an Ending HCV Playbook in 2023 which emphasized the role of primary care physicians (PCPs) in screening, treating, and curing HCV. The Playbook was designed for health center providers treating the highest-risk patients.[12] However, several barriers exist that may limit the impact of the Playbook, including Medicaid prior authorization restrictions and the lack of knowledge and training among PCPs for treating HCV patients.[13,14]

Improving HCV screening and testing in Ohio requires understanding the geographic variation, the availability of health care resources, and other characteristics associated with high and low HCV screening and treatment rates. This knowledge will allow for targeted approaches for increasing access to screening and treatment and improving the HCV clearance cascade. The objective of this research was to assess the geographic variation of HCV testing and treatment rates in Ohio.

METHODS

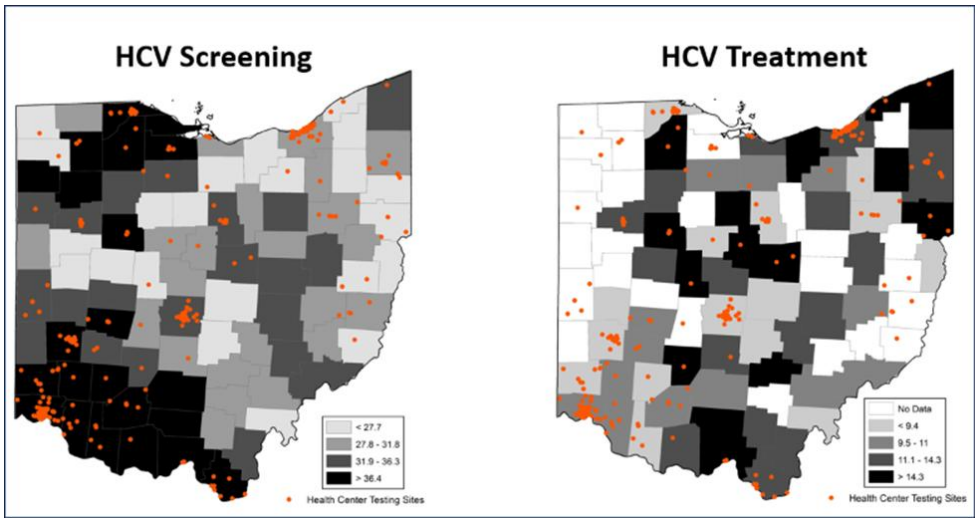
This cross-sectional study used secondary data from the State of Ohio Integrated Behavioral Health Dashboard.[11] The State of Ohio Department of Public Health collects HCV screening, prevalence, mortality, and treatment data from participating health departments, adjudicates the data, and makes it available to the public. Contained in this county level data are the numbers of people seeking HCV treatment, people being screened for HCV, PCPs, and testing sites. The HCV screening, prevalence, mortality, and treatment rates were calculated as the number of Medicaid enrollees aged 18–64 years with OUD who were screened or treated for HCV in 2021, divided by the total county population, and standardized per 100 000 residents. Similarly, we standardized the PCP rate by county. We used the geographic information system (GIS) software GeoDa (version 1.22) to create county-level maps of HCV screening and treatment rates across Ohio, categorized by quartile.[15]

High HCV screening and treatment counties were defined as those in the top quartile, while low HCV screening and treatment counties were defined as those in the bottom quartile. We conducted t tests to compare high and low HCV screening and treatment, while also comparing HCV mortality, drug overdose death rates, rate of PCPs, rate of HCV physician specialists (infectious disease, hepatology, gastroenterology), and the number of health center HCV testing sites, as well as racial/ethnic characteristics. Note that HCV treatment data were not available for 27 counties, and they were removed when conducting analysis on high/low treatment counties. The study was deemed exempt from institutional review board review due to its reliance on publicly available secondary data.

RESULTS

Figure 1 displays the geographic patterns for HCV screening and treatment based upon the number of screening exams or people treated per 100 000 people. The maps show higher screening rates in counties in southwestern and northwestern Ohio compared to the rest of the state. Different geographic patterns emerge for HCV treatment, where

Figure 1. Ohio Maps of Hepatitis C Virus (HCV) Screening and Treatment with Health Center HCV Screening Locations



The county levels maps were separated into quartiles based upon the number of HCV screening exams or people treated for HCV per 100 000 people. The darker shade indicates higher rates. The orange dots are the location of health center testing sites.

northeastern Ohio has the highest rates and southwestern Ohio has lower HCV treatment rates. Scioto County and Pike County (both in southeastern Ohio) and Hardin County and Wood County (both in northwestern Ohio) had high HCV screening and treatment rates. Four counties have low screening and treatment rates: Jefferson County in northeastern Ohio, Fairfield County and Licking County (both in central Ohio), and Meigs County in southeastern Ohio.

Table 1 displays the characteristics of high and low screening and treatment counties by quartile. High screening counties have significantly higher rates of HCV mortality and drug overdose mortality. These counties have lower rates of HCV prevalence and HCV treatment, though not significant. High screening counties have more health care resources, including significantly higher numbers of health center testing sites compared to low screening rate counties (6.1 vs 0.8) and higher rates of PCPs per 100 000 (53.9 vs 45.5), though the differences are not statistically significant.

There are no significant differences in HCV mortality, HCV screening, or drug overdose mortality when comparing high and low HCV treatment counties. However, low HCV treatment counties were home to almost 13 000 people in correctional facilities, which comprised almost 30% of Ohio's prison population. Further, low HCV treatment counties were more likely to be located in metropolitan areas when compared to high treatment counties and have significantly higher percentages of Black populations. High treatment counties have fewer health care resources than counties with lower rates, including significantly fewer HCV physician specialists (infectious disease, hepatology, gastroenterology) and PCPs per 100 000 population.

CONCLUSION

Eliminating HCV requires increased access to testing and treatment, of which we found substantial geographic variation across Ohio counties despite federal and state programs to eliminate HCV. We found that better access to health centers and PCPs may improve screening rates but were not associated with increased treatment. This may be partly explained by barriers such as Ohio Medicaid prior authorization restrictions that may limit access to treatment, which is consistent with other literature.[16] Further, we found that low HCV treatment counties have higher rates of health care resources and are more likely to be located in metropolitan areas, suggesting that other factors may be contributing to the low HCV treatment rates. Gonzalez et al identified several primary care provider-perceived barriers to providing HCV treatment, including having limited experience with HCV treatment and the need for more provider and public awareness of treatment improvements.[17] This is consistent with other literature documenting a lack of PCP confidence in treating HCV. Doshi et al found that 59% of PCPs referred all HCV patients to specialist, and Thomson et al found that 71% referred all HCV patients to specialists, with only 9% who felt comfortable treating chronic HCV patients.[13,14] Given that research has found that PCPs can effectively treat HCV for most patients,[18,19] several articles have recommended increasing PCP HCV treatment capacity as one of the key elements for eliminating HCV[20,21] including Guss et al, "The time has arrived for PCPs to diagnose, treat, and cure patients with HCV, and interested PCPs should be able to add HCV as a disease that they can successfully manage in a primary care setting."[21]

Table 1. Characteristics of High/Low Hepatitis C Virus (HCV) Screening/Treatment Counties

	Screening Q1 (Low)	Screening Q4 (High)	Treatment Q1 (Low)	Treatment Q4 (High)	Ohio
Number of counties	22	22	15	15	88 (61)
HCV Measures					
HCV Prevalence	75.1***	63.5	64.9	70.8	66.3
HCV Screening	25.4***	39.8	33.5	32.1	33.9
HCV Treatment	13.4	11.5	7.9***	18.4	11.2
HCV Mortality	2.3**	4.0	3.2	3.3	3.3
Risk Factors					
Drug overdose mortality	27.0*	39.9	40.7	37.1	38.0
Number of prisons	5	5	6	5	31
State prison population	8000	9349	12 865	8367	45 022
Resources					
Number of HCV testing sites	0.8*	6.1	5.7*	1.4	2.7
PCPs per 100 000	45.5	53.9	61.4**	40.8	49.4
HCV specialist per 100 000[a]	238.9	363.6	491.0	246.6	381.6
Other Characteristics					
Number of nonmetropolitan counties	12 (55%)	12 (55%)	3 (20%)	8 (53%)	
Black (%)	3.4	5.4	8.5	2.6**	4.4

Note: *p<.05; **p<.01; ***p<.001 (comparing high (Q4) /low (Q1) HCV screening and treatment).

[a]Hepatitis C virus specialists are defined as hepatologists, gastroenterologists, and infectious disease specialists.

This research had several limitations. First, the data source includes only Ohio Medicaid enrollees aged 18-64 years with a diagnosis of OUD, meaning the high-risk Medicare population[22] was excluded from the analysis. Also excluded from the analysis were people in correctional facilities, another known high risk population. A third limitation was that the data for this analysis do not capture recent changes in the Ohio Medicaid policy landscape affecting HCV treatment, including easing restrictions that required HCV specialists to prescribe certain medications.[23] Despite these limitations, the geographic knowledge of counties with high screening and treatment of HCV may allow best practices to be communicated to counties with low screening and treatment and help all Ohioans.

PUBLIC HEALTH IMPLICATIONS

Addressing the geographic disparities in screening and treatment of HCV is critical to achieving state and national goals.[3,4,23,24] Despite a decline in HCV cases, rates, and mortality,[4] Ohio still has among the lowest HCV care cascade rates in the US.[10] Our research found substantial variation across the state with low screening rates in the Ohio counties of Jefferson, Meigs, Fairfield, and Licking. Targeting interventions such as improving PCP capacity, expanding the reach of community health centers, and public outreach campaigns in these counties may achieve the more immediate results and have the greatest effect on the statewide population. Further, best practices can be learned from the high performing counties and spread throughout the state.

The economic and health benefits of improving HCV care are particularly impactful for Ohio, a state with one of the lowest HCV care cascade rates in the US.[10] Targeted interventions based upon our results can prevent advanced liver disease, reduce health care costs, and save lives while reducing health disparities in vulnerable communities.

AUTHOR CONTRIBUTION

Michael Topmiller conceived of the work, acquired the data, and was the primary analyst of the work. Aaron Vissman, Peter Mallow, and Adam Visconti aided in the design of the work. Peter Mallow was responsible for drafting the manuscript. All authors contributed to the interpretation of the results, critically reviewed the manuscript, approved the final version, and are accountable for the work.

CONFLICT OF INTEREST

The authors report no conflicts of interest related to this work.

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