

Geographical Variation of Hepatitis C Virus Infection among Urban-Rural Classifications and Age Groups in Tennessee

Heather Wingate, MPH, Lindsey Sizemore, MPH, MPH, CPH, Jennifer Black, MPH, Pamela Talley, MD, MPH
Tennessee Department of Health, Nashville, TN

Background

- In Tennessee (TN), the majority of acute hepatitis C virus (HCV) infections occur among young persons who report a history of illicit drug use, have experienced incarceration, and are living in eastern and northeastern TN.¹
- TN surveillance data shows a bimodal distribution of chronic HCV infections, with approximately half of newly reported chronic infections from 2014–2018 occurring among individuals less than 45 years of age.
- TN provides HCV treatment and harm reduction resources which include Viral Hepatitis Case Navigators (VHCNs), Harm Reduction Resource Team (HRRTs) Nurses, and privately operated Syringe Service Programs (SSPs).
- We sought to determine the following with respect to acute and chronic HCV rates: (1) urbanicity (2) geographical variation among age groups, and (3) location of three types of harm reduction programs in TN to assess service gaps for those most vulnerable to HCV infection.

Methods

- HCV case data were obtained from the National Electronic Disease Surveillance System Based System (NBS) for persons meeting case definition for acute or chronic HCV infection and have an NBS investigation (confirmed or probable).²⁻⁴
- Records were de-duplicated and included if they met the following criteria: (1) HCV investigation date between 07/01/2015–12/31/2019, (2) complete DOB, (3) complete residential county information, (4) determined to be a TN resident, and (5) ≥15 years of age as of 07/01/2015.²
- Counties were classified utilizing the Urban-Rural Classification Scheme for Counties (Figure 1), persons were grouped into age categories, and rates were calculated using U.S. Census data.⁵

Contact

For more information, contact:
Heather Wingate, Viral Hepatitis Epidemiologist
Tennessee Department of Health
p. 615-253-0679
Heather.Wingate@tn.gov

Results

Figure 1. Urban-Rural County Classification and Tennessee Public Health Region

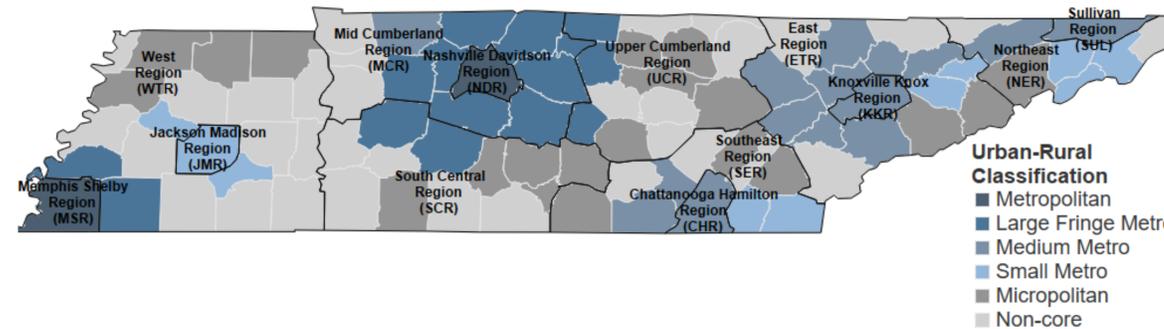
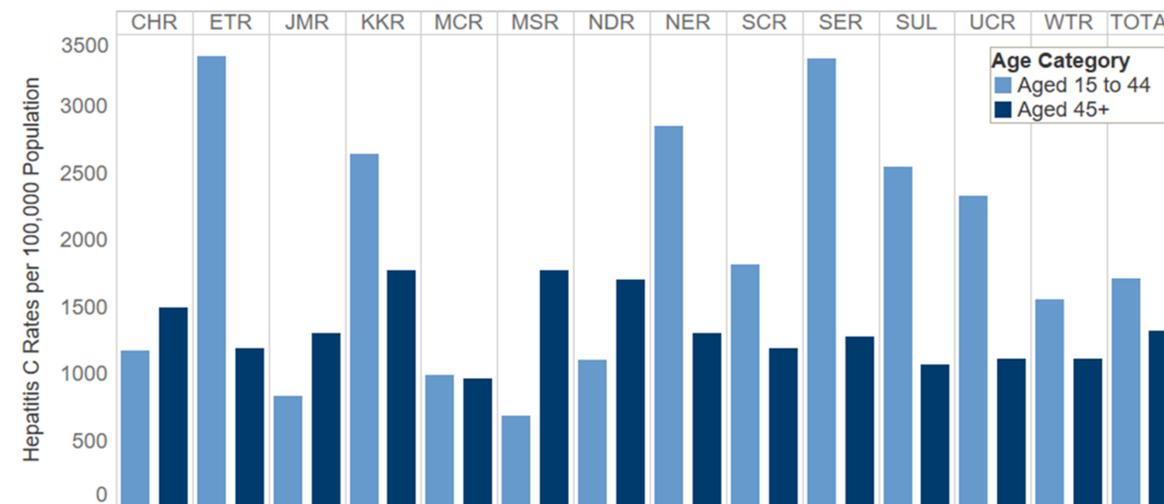


Figure 2. Acute and Chronic Hepatitis C Virus Rates by Urban-Rural Classification

Metropolitan	Large central metro counties in metropolitan statistical area of 1 million population that: 1) contain the entire population of the largest principal city of the metropolitan statistical area, or 2) are completely contained within the largest principal city of the metropolitan statistical area, or 3) contain at least 250,000 residents of any principal city in the metropolitan statistical area	1,280 per 100,000 persons n = 16,736
Large Fringe Metro	Counties in metropolitan statistical area of 1 million or more population that do not qualify as large central	1,023 per 100,000 persons n = 10,739
Medium Metro	Counties in metropolitan statistical area of 250,000-999,999 population	1,782 per 100,000 persons n = 24,859
Small Metro	Counties in metropolitan statistical area of less than 250,000 population	1,440 per 100,000 persons n = 6,817
Micropolitan	Micropolitan counties in micropolitan statistical area	1,472 per 100,000 persons n = 10,412
Non-core	Counties not in micropolitan statistical area	2,434 per 100,000 persons n = 13,017
Total	All counties	1,510 per 100,000 persons n = 82,580

Metropolitan Statistical Area: a core area containing a substantial population nucleus, together with adjacent communities having a high degree of economic and social integration with that core and must have at least one urbanized area of 50,000 or more inhabitants.
Micropolitan Statistical Area: a core area containing a substantial population nucleus, together with adjacent communities having a high degree of economic and social integration with that core and must have at least one urban cluster of at least 10,000 but less than 50,000 population.

Figure 3. Acute and Chronic Hepatitis C Virus Rates by Age and Public Health Region



Conclusions

- There were 82,580 persons with a newly reported acute or chronic HCV infection during the time period studied.
- High rates of HCV infection were observed in the non-core counties (2,434 per 100,000 persons), while the lowest rates of HCV infection were observed in the large fringe metro counties (1,023 per 100,000) (Figure 2).
- While persons aged 45 plus were dispersed across the state, persons aged 15–44 had elevated rates in the eastern and southeastern regions (Figure 3).
- Only two public health regions (KKR and NER) contained all three HCV harm reduction services.

Discussion

- This analysis illustrated that the preponderance of HCV infections were in the most rural locales.
- There was geographical clustering of HCV infection among persons by age categories.
- VHCNs are available statewide, HRRTs serve three regions with high HCV rates among persons aged 15 to 44 (ETR, NER, KKR), and the SSPs are only concentrated in metro areas (MSR, NDR, KKR, NER).

Implications/Next Steps

- As persons aged less than 45 accounted for the majority of new infections, it is important to target areas with high rates of HCV infection among this population.
- There is a demonstrated need to implement additional HCV and harm reduction services to areas in need, specifically in rural locales.
- While many metropolitan areas provide at least two HCV and/or harm reduction services, rural regions lack these resources.
- TN hopes to expand access to HCV and harm reduction services to our most vulnerable populations to reduce the transmission of HCV.

Works Cited

- Tennessee Department of Health. Tennessee Viral Hepatitis Epidemiological Profile, 2018. Retrieved from https://www.tn.gov/content/dam/tn/health/documents/viralhepatitis/2018%20Epi%20Profile_Final.pdf
- Tennessee National Electronic Disease Surveillance System Based System (NBS). Accessed 7/14/2020.
- Centers for Disease Control and Prevention. Hepatitis C, Acute 2016 Case Definition. Retrieved from <https://www.cdc.gov/nndss/conditions/hepatitis-c-acute/case-definition/2016/>
- Centers for Disease Control and Prevention. Hepatitis C, Chronic 2016 Case Definition. Retrieved from <https://www.cdc.gov/nndss/conditions/hepatitis-c-chronic/case-definition/2016/>
- National Center for Health Statistics. 2013 NCHS Urban – Rural Classification Scheme for Counties. Vital Heal Stat. 2014;2(166).