U.S. CENTERS FOR DISEASE CONTROL AND PREVENTION

Comorbidities among Medicaid Enrollees with Chronic Hepatitis C, 2016-2020

Angela T Estadt PhD, MPH[1], Hasan Symum[2], William W Thompson[2], Taiwo Abimbola[1], Michelle Van Handel[1]

1. Program and Performance Improvement Office, Office of the Director, National Center for HIV, Viral Hepatitis, STD, and Tuberculosis Prevention (NCHHSTP), Centers for Disease Control and Prevention (CDC), United States.
2. Division of Viral Hepatitis, National Center for HIV, Viral Hepatitis, STD, and Tuberculosis Prevention (NCHHSTP), Centers for Disease Control and Prevention (CDC), United States.

Background

- To eliminate hepatitis C in the United States (U.S.), understanding comorbidities among those with chronic hepatitis C is essential for effective prevention and treatment.
- Populations disproportionately affected include people who inject drugs[1], with HIV[2], belong to certain racial/ethnic groups[3], have lower incomes or unstable housing[4], the medically underserved[5], and those with mental health conditions[6].
- These populations face increased risks for hepatitis C-related comorbidities, creating syndemics influenced by social factors that worsen health outcomes[7,8].

We aimed to describe the prevalence of hepatitis C-related comorbidities—specifically HIV, STIs, drug overdoses, substance use disorders, and mental health disorders—within 12 months of a Medicaid beneficiary's hepatitis C diagnosis.

Methods

- We conducted a descriptive analysis using cross-sectional data from the 2016 to 2021 U.S. Centers for Medicare & Medicaid Services (CMS) Transformed Medicaid Statistical Information System (T-MSIS) datasets.
- We defined the chronic hepatitis C diagnosis index date for Medicaid beneficiaries using the first HCV RNA code (CPT 87520, 87521, or 87522) with an ICD-10 chronic hepatitis C code (B18.2) at least one day after the index date for persons who were enrolled between 2016 and 2020.
- Inclusion criteria included index date assigned between 2016 to 2020 who met the following characteristics: aged 18-64 at diagnosis, not dually enrolled in Medicare, enrolled for at least 12 months post-diagnosis, not missing age or sex, and residing in the U.S. or District of Columbia.
- Primary hepatitis C-related comorbidities were defined as HIV, STIs, overdoses, mental health disorders, and substance use disorders occurring within 12 months of the index date.
- Unadjusted and adjusted prevalence ratios using log-binomial regression were used to assess associations between comorbidities and age (18-44 vs. 45-64). Sex and state were included in the mixed effects model to account for state-level clustering.

Results

- Among the two age groups, 59% of beneficiaries with chronic hepatitis C were aged 45-64. Notable differences included a higher percentage of females in the younger group (53% vs. 39%) and more with Medicaid Expansion (57% vs. 41%). The older group had a larger proportion identifying as Black, non-Hispanic (21% vs. 5%).
- In adjusted **models, younger beneficiaries were less likely to have an HIV diagnosis, an alcohol use disorder, or experience an alcohol overdose** compared to those aged 45-64.
- In contrast, **younger beneficiaries were more likely to be diagnosed with** comorbidities, including **chlamydia**, **≥1 drug overdose,** and **≥1 mental health disorder.**

Table 1. Prevalence of Comorbidities Among Medicaid Beneficiaries with Chronic Hepatitis C, Stratified by Age Group, 2016-2020

	Total		Aged 18-44		Aged 45-64	
	N	%	N	%	N	%
TOTAL	509, 281	100%	211,145	41.5%	298,136	58.5%
HIV diagnosis	26,268	5.2%	6,638	3.1%	19,630	6.6%
Sexually Transmitted Infections						
Chlamydia , Gonorrhea, or Syphilis	6,837	1.3%	4,065	1.9%	2,772	0.9%
Chlamydia	1,431	0.3%	1,148	0.5%	283	0.1%
Gonorrhea	1,613	0.3%	1,191	0.6%	422	0.1%
Syphilis	3,994	0.8%	1,879	0.9%	2,115	0.7%
Overdoses*						
Overdose from ≥ 1 included substances	41,637	8.2%	22,538	10.7%	19,099	6.4%
Opioid	16,029	3.1%	10,004	4.7%	6,025	2.0%
Cocaine	1,130	0.2%	464	0.2%	666	0.2%
Psychostimulant (methamphetamine)	1,680	0.3%	998	0.5%	682	0.2%
Cannabis	302	0.1%	175	0.1%	127	0.0%
Hallucinogenic	64	0.0%	33	0.0%	31	0.0%
Barbiturates	38	0.0%	15	0.0%	23	0.0%
Benzodiazepines	735	0.1%	350	0.2%	385	0.1%
Clonidine	285	0.1%	105	0.1%	180	0.1%
Alcohol	713	0.1%	201	0.1%	512	0.2%
Other substances	21,802	4.3%	10,782	5.1%	11,020	3.7%
Mental Health Disorders						
≥ 1 of the listed Mental Health Disorders	253,052	49.7%	120,478	57.1%	132,574	44.5%
Depression	98,616	19.4%	42,528	20.1%	56,088	18.8%
Anxiety	96,454	18.9%	50,433	23.9%	46,021	15.4%
PTSD	26,799	5.3%	14,448	6.8%	12,351	4.1%
Bipolar	46,916	9.2%	23,235	11.0%	23,681	7.9%
Schizophrenia	12,006	2.4%	3,429	1.6%	8,577	2.9%
OCD	940	0.2%	535	0.3%	405	0.1%
Borderline Personality Disorder	1,496	0.3%	977	0.5%	519	0.2%
Substance Use Disorders						
≥ 1 of the listed Substance Use Disorders	272,848	53.6%	149,139	70.6%	123,709	41.5%
Alcohol	49,335	9.7%	13,501	6.4%	35,834	12.0%
Opioid	166,395	32.7%	106,466	50.4%	59,929	20.1%
Cannabinoid	13,424	2.6%	7,365	3.5%	6,059	2.0%
Sedative-hypnotics	3,083	0.6%	1,963	0.9%	1,120	0.4%
Cocaine	13,932	2.7%	5,596	2.7%	8,336	2.8%
Stimulant (ex. methamphetamine)	25,194	4.9%	15,707	7.4%	9,487	3.2%
Hallucinogen	322	0.1%	177	0.1%	145	0.1%
Multiple Drug Use/Other	27,468	5.4%	15,727	7.5%	11,741	3.9%

*Includes fatal and non-fatal overdoses

Figure 1. Frequency of Chronic Hepatitis C Diagnoses Among Medicaid Beneficiaries (n=509,281), by Age and Biological Sex, 2016-2020.

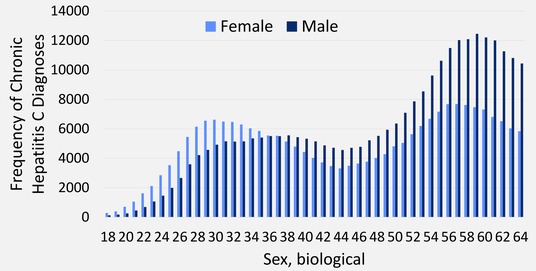


Table 2. Prevalence Ratios of Comorbidities Among Younger Compared to Older Medicaid Beneficiaries with Chronic Hepatitis C, 2016-2020*

	Unadjusted*		Adjusted*,**	
	PR	95% CI	aPR	95% CI
HIV diagnosis	0.53	(0.41, 0.68)	0.56	(0.43, 0.73)
Sexually Transmitted Diseases				
Chlamydia, Gonorrhea, or Syphilis	2.28	(1.90, 2.75)	2.25	(1.86, 2.72)
Chlamydia	6.05	(4.55, 8.04)	5.52	(4.23, 7.21)
Gonorrhea	4.34	(3.42, 5.50)	4.12	(3.21, 5.27)
Syphilis	1.40	(1.10, 1.79)	1.44	(1.14, 1.83)
Overdoses†				
Overdose from ≥ 1 of the listed substances	1.58	(1.48, 1.68)	1.63	(1.53, 1.75)
Opioid	2.12	(1.96, 2.30)	2.22	(2.04, 2.42)
Cocaine	0.95	(0.79, 1.14)	0.99	(0.84, 1.19)
Psychostimulant (methamphetamine)	2.37	(1.91, 2.95)	2.50	(1.96, 3.19)
Cannabis	2.03	(1.49, 2.76)	2.16	(1.59, 2.93)
Hallucinogens	1.57	(0.81, 3.02)	1.73	(0.88, 3.40)
Barbiturates	0.88	(0.49, 4.57)	0.83	(0.44, 1.56)
Benzodiazepines	1.23	(1.04, 1.44)	1.20	(1.03, 1.41)
Clonidine	0.80	(0.53, 1.22)	0.80	(0.53, 1.22)
Alcohol	0.63	(0.53, 0.74)	0.68	(0.58, 0.79)
Other substances	1.32	(1.24, 1.40)	1.35	(1.27, 1.44)
Mental Health Disorders				
≥ 1 of the listed Mental Health Disorders	1.22	(1.19, 1.26)	1.17	(1.14, 1.21)
Depression	1.01	(0.97, 1.06)	0.98	(0.94, 1.03)
Anxiety	1.45	(1.38, 1.51)	1.38	(1.32, 1.45)
PTSD	1.53	(1.44, 1.63)	1.44	(1.35, 1.53)
Bipolar	1.37	(1.31, 1.44)	1.28	(1.22, 1.35)
Schizophrenia	0.66	(0.54, 0.79)	0.71	(0.60, 0.85)
OCD	1.79	(1.53, 2.10)	1.72	(1.47, 2.01)
Borderline Personality Disorder	2.60	(2.25, 3.00)	2.18	(1.90, 2.51)
Substance Use Disorders				
≥ 1 of the listed Substance Use Disorders	1.58	(1.51, 1.65)	1.57	(1.50, 1.65)
Alcohol	0.51	(0.46, 0.57)	0.55	(0.50, 0.60)
Opioid	2.14	(1.91, 2.40)	2.15	(1.92, 2.41)
Cannabinoids	1.62	(1.53, 1.71)	1.65	(1.56, 1.75)
Sedative-hypnotics	2.23	(1.98, 2.53)	2.16	(1.90, 2.46)
Cocaine	0.88	(0.74, 1.04)	0.87	(0.73, 1.04)
Stimulant (ex. methamphetamine)	2.57	(2.17, 3.03)	2.60	(2.20, 3.07)
Hallucinogen	2.09	(1.44, 3.02)	2.20	(1.51, 3.19)
Multiple Drug Use/Other	1.83	(1.70, 1.98)	1.86	(1.72, 2.01)

*Adjusted for random effects of state residence
**Adjusted for sex
†Includes fatal and non-fatal overdoses

Conclusions

- **Overall, half of Medicaid beneficiaries with chronic hepatitis C had at least one mental health disorder or substance use disorder.**
- We observed distinct patterns of comorbidities among beneficiaries with chronic hepatitis C by age group, with younger beneficiaries having a higher burden of most comorbidities than older beneficiaries. Comprehensive or targeted services may help younger beneficiaries address the multiple comorbidities they may be experiencing, such as STIs, overdoses, and substance use disorders and linkage to hepatitis C treatment.
- Older beneficiaries were more likely to have HIV and schizophrenia and experience alcohol-related outcomes. The clustering of HCV and HIV infections among the older population may indicate a history of untested blood supply before 1992[9] or the interconnected HIV and HCV epidemics between 1980-2000[10].
- Findings are limited by claims data, which may include coding or administrative errors, underreporting of mental health and substance use disorders from social acceptability bias, and the exclusion of those with no or other insurance (private, Medicare, VA, Ryan White support, etc.).

References

1. Zibbell JE, Asher AK, Patel RC, et al. Increases in Acute Hepatitis C Virus Infection Related to a Growing Opioid Epidemic and Associated Injection Drug Use, United States, 2004 to 2014. Am J Public Health. Feb 2018;108(2):175-181. doi:10.2105/ajph.2017.304132
2. Thomas DL, Astemborski J, Rai RM, et al. The natural history of hepatitis C virus infection: host, viral, and environmental factors. Jama. Jul 26 2000;284(4):450-6. doi:10.1001/jama.284.4.450
3. Centers for Disease Control and Prevention. Viral Hepatitis Surveillance Report - United States, 2022. April 2024. https://www.cdc.gov/hepatitis/statistics/2022surveillance/index.htm
4. Arum C, Fraser H, Artenie AA, et al. Homelessness, unstable housing, and risk of HIV and hepatitis C virus acquisition among people who inject drugs: a systematic review and meta-analysis. Lancet Public Health. May 2021;6(5):e309-e323. doi:10.1016/s2468-2667(21)00013-5.
5. Lewis KC, Barker LK, Jiles RB, Gupta N. Estimated Prevalence and Awareness of Hepatitis C Virus Infection Among US Adults: National Health and Nutrition Examination Survey, January 2017–March 2020. Clinical Infectious Diseases. 2023;77(10):1413-1415. doi:10.1093/cid/ciad411
6. Enescu A, Mitrut P, Balasoiu M, Turculeanu A, Enescu AS. Psychosocial issues in patients with chronic hepatitis B and C. Curr Health Sci J. Apr-Jun 2014;40(2):93-6. doi:10.12865/chsj.40.02.02
7. Degenhardt L, Webb P, Colledge-Frisby S, et al. Epidemiology of injecting drug use, prevalence of injecting-related harm, and exposure to behavioural and environmental risks among people who inject drugs: a systematic review. The Lancet Global Health. 2023;11(5):e659-e672. doi:10.1016/S2214-109X(23)00057-8
8. Singer M, Bulled N, Ostrach B, Mendenhall E. Syndemics and the biosocial conception of health. Lancet. Mar 4 2017;389(10072):941-950. doi:10.1016/S0140-6736(17)30003-X
9. Angelotta C, McKoy JM, Fisher MJ, et al. Legal, financial, and public health consequences of transfusion-transmitted hepatitis C virus in persons with haemophilia. Vox Sang. 2007;93(2):159-165. doi:10.1111/j.1423-0410.2007.00941.x
10. Mannucci PM. AIDS, hepatitis and hemophilia in the 1980s: memoirs from an insider. J Thromb Haemost. 2003;1(10):2065-2069. doi:10.1046/j.1538-7836.2003.00483.x

Contact Info

Angela T Estadt, Program and Performance Improvement Office, Office of the Director, National Center for HIV, Viral Hepatitis, STD, and Tuberculosis Prevention (NCHHSTP). AEstadt@cdc.gov 440-339-7427