

Hepatitis C Screening Rate Among Underserved Adults With Serious Mental Illness Receiving Care in California Community Mental Health Centers

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Although HCV is more prevalent among people with severe mental illness (SMI; e.g., schizophrenia, bipolar disorder) than in the general population (17% vs 1%), no large previous studies have examined HCV screening in this population. In this cross-sectional study, we examined administrative data for 57 170 California Medicaid enrollees with SMI to identify prevalence and predictors of HCV screening from October 2010 through September 2011. Only 4.7% (2674 of 57 170) received HCV screening, with strongest predictors being nonpsychiatric health care utilization and comorbid substance abuse. (*Am J Public Health*. 2016;106:740–742. doi:10.2105/AJPH.2016.303059)

People with severe mental illness (SMI; e.g., schizophrenia, bipolar disorder) die 25 years earlier than the general population.¹ Although cardiovascular disease represents the primary cause of mortality,¹ blood-borne infectious diseases are another contributor.² HCV is the most prevalent blood-borne infection in the United States; by the best available estimates, more than 17% of people with SMI have HCV, compared with only 1% of the general US population.² Although prevention, early detection, and treatment are crucial interventions for high-risk populations, most people with SMI do not receive these services.³ To our knowledge, no previous large studies have examined HCV testing among this high-risk population served in the public mental health system.⁴

METHODS

In this cross-sectional study, we used de-identified administrative data from California Medicaid enrollees to assess HCV antibody screening (Current Procedural Terminology⁵ [CPT] code 86803) administered between October 1, 2010 and September 30, 2011 among individuals with SMI. Enrollees included in the study were

1. aged 18 years or older,
2. diagnosed with SMI by mental health providers in the matched electronic system (Claim Status Inquiry),
3. prescribed an antipsychotic medication at least once during the study period,
4. receiving care in a California community mental health clinic,
5. Medicaid enrollees, and
6. not dually eligible for Medicare.

We excluded the dually eligible population because Medicare laboratory billing data were unavailable. Additional characteristics collected included age, gender, race/ethnicity, county type (rural vs urban), comorbid alcohol or drug use, and nonpsychiatric medical office visits (CPT codes 99201–99205, 99211–99215, and 99241–99245).

We used a directed acyclic graph for HCV screening to identify confounders and

mediators of each predictor of interest. We used Poisson regression to estimate the relative prevalence of HCV screening for each predictor, adjusting for confounders identified by the directed acyclic graph.⁶ Because California delegates delivery of mental health services to counties, we used robust standard errors to account for clustering of outcomes by county and to accommodate use of a Poisson model for a binary outcome.⁶ Seven of 58 rural counties (12%) had few observations and were grouped with counties of similar size, region, and demographics.⁷ We excluded all San Mateo County data since there were far fewer observations than expected. This was probably because San Mateo was early in adopting the California County Organized Health System, a mandatory managed care model, which affected its reporting to the mental health electronic system during the study period.

RESULTS

Table 1 shows the characteristics of the sample of 57 170 people with SMI, the proportions receiving HCV screening, and adjusted screening prevalence ratios. Overall, only 4.7% of patients (2674 of 57 170) received HCV screening over the study period. After adjustment for potential confounders,

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TABLE 1—Demographic and Clinical Characteristics of Medicaid Recipients With Severe Mental Illness (SMI), by HCV Screening: California, 2010–2011

Characteristic	Overall Sample (n = 57 170), No. (%)	Screened for HCV, ^a No. (%)	Adjusted PR (95% CI)	P
Overall	57 170 (100)	2 674 (4.7)		
Race/ethnicity ^b				.015
White	21 608 (38)	942 (4.4)	1 (Ref)	
Asian/Pacific Islander	7 234 (13)	420 (5.8)	1.36 (1.05, 1.76)	
African American	11 060 (19)	575 (5.2)	1.21 (1.03, 1.42)	
Hispanic	11 321 (20)	463 (4.1)	0.98 (0.89, 1.08)	
Other	5 947 (10)	274 (4.6)	1.07 (0.96, 1.20)	
Female gender ^b	31 503 (55)	1 570 (5.0)	1.13 (0.97, 1.32)	.11
Age, ^{b,c} y				.001
18–27	8 911 (16)	341 (3.8)	1 (Ref)	
28–37	9 893 (17)	460 (4.6)	1.19 (1.05, 1.35)	
38–47	14 128 (25)	687 (4.9)	1.23 (1.09, 1.37)	
48–57	16 809 (29)	873 (5.2)	1.29 (1.07, 1.55)	
58–67	7 154 (13)	307 (4.3)	1.06 (0.90, 1.25)	
68–77	242 (0)	5 (2.1)	0.52 (0.21, 1.30)	
≥78	33 (0)	1 (3.0)	0.76 (0.09, 6.24)	
County type ^b				.11
Rural	1 617 (3)	96 (5.9)	1.37 (0.93, 2.02)	
Urban	55 553 (97)	2 578 (4.6)	1 (Ref)	
Diagnosis ^d				.36
Schizophrenia spectrum	29 903 (52)	1 332 (4.5)	1 (Ref)	
Anxiety disorder	2 135 (4)	112 (5.2)	1.16 (0.91, 1.46)	
Bipolar disorder	8 147 (14)	392 (4.8)	1.07 (0.97, 1.18)	
Major depressive disorder	12 995 (23)	668 (5.1)	1.13 (0.99, 1.28)	
Other	3 990 (7)	170 (4.3)	1.00 (0.88, 1.14)	
Comorbid drug/alcohol use history ^e	10 134 (18)	603 (6.0)	1.42 (1.32, 1.54)	<.001
Nonpsychiatric health care utilization ^f	37 477 (66)	2 141 (5.7)	2.13 (1.67, 2.72)	<.001

Note. CI = confidence interval; PR = prevalence ratio.

^aDefined by evidence of hepatitis C testing in the past year.

^bControlling for 3 main demographic variables (gender, race/ethnicity, age) and county type, unless it is the predictor variable of interest.

^cThese age categories were those provided to the study investigators by the California Department of Health Care Services.

^dControlling for main demographic variables, county type, and comorbid substance abuse.

^eControlling for main demographic variables, county type, and psychiatric diagnosis.

^fControlling for main demographic variables, county type, psychiatric diagnosis, and comorbid substance abuse.

HCV screening was moderately more common among Asians/Pacific Islanders and African Americans than among Whites, and among the middle aged (38–57 years) than young adults. HCV screening was strongly linked to nonpsychiatric outpatient care utilization, as well as to comorbid drug or alcohol use. There were no clinically meaningful differences in HCV screening by psychiatric

diagnosis, gender, or county type (rural vs urban).

DISCUSSION

To our knowledge, this study represents the largest examination of HCV screening of adults with SMI served within the public

mental health system.⁴ Our main finding is that only 4.7% of people with SMI were screened for HCV infection over a 1-year period. This is lower than US population screening rates (12.7%).⁸ Given the high prevalence of HCV among people with SMI,^{2,9} this finding represents a significant public health concern.

It is recognized that screening programs for high-risk populations are urgently needed since almost half of HCV infections are undiagnosed.⁴ Although the US Preventive Services Task Force does not yet recommend annual HCV screening in high-risk populations,¹⁰ the Veterans Affairs Medical Center (VAMC) encourages yearly screening for people with HCV risk factors.¹¹ Given the high HCV prevalence among the SMI population,^{2,9} adopting VAMC screening practices in public mental health clinics might be worth considering.

This study has several limitations. Lack of prior HCV diagnostic information could lead to an underestimation of HCV screening rates. Similarly, potential lack of inclusion of CPT billing codes for HCV by providers completing these forms could also cause HCV screening rates to be underestimated. Because most public mental health care systems are not integrated with general medical care, future research could examine HCV screening and prevalence among people with SMI within an electronically integrated health care system that includes all laboratory tests and results (e.g., Kaiser Permanente). Additional studies should explore the cost-effectiveness of regular screening and treatment of HCV for this vulnerable population.

In conclusion, there are disturbingly low rates of HCV screening among a high-risk SMI population. Because people with SMI utilize public mental health clinics rather than primary care,¹² these clinics are their medical home.¹³ Since community psychiatrists are therefore the de facto primary care providers, they must be provided with education on the importance of screening for blood-borne infections like HCV. **AJPH**

CONTRIBUTORS

E. Trager contributed to the concept and design of the study and to the analysis and interpretation of data, and drafted and made revisions to the article. M. Khalili made contributions to the study design and to the review and revision of the article, including interpretation and presentation of data. C. L. Masson helped conceptualize ideas, assisted in the interpretation of the findings, and reviewed and revised drafts of the article. E. Vittinghoff made substantial contributions to analyzing and interpreting the data and revising

the content. J. Creasman contributed to the concept and design of the study and to the analysis and interpretation of data, and drafted and made revisions. C. Mangurian made substantial contribution to the conception and design of the study, interpretation of the data, drafting and revising the content, and coordinating the study overall. All authors approved the final version of the article.

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HUMAN PARTICIPANT PROTECTION

This study was approved by the University of California, San Francisco Committee on Human Research (11-06939).

REFERENCES

- Colton CW, Manderscheid RW. Congruencies in increased mortality rates, years of potential life lost, and causes of death among public mental health clients in eight states. *Prev Chronic Dis*. 2006;3(2):A42.
- Hughes E, Bassi S, Gilbody S, Bland M, Martin F. Prevalence of HIV, hepatitis B, and hepatitis C in people with severe mental illness: a systematic review and meta-analysis. *Lancet Psychiatry*. 2016;3(1):40–48.
- Rosenberg S, Brunette M, Oxman T, et al. The STIRR model of best practices for blood-borne diseases among clients with serious mental illness. *Psychiatr Serv*. 2004;55(6):660–664.
- Zuure FR, Urbanus AT, Langendam MW, et al. Outcomes of hepatitis C screening programs targeted at risk groups hidden in the general population: a systematic review. *BMC Public Health*. 2014;14:66.
- Department of Health and Human Services, Centers for Medicare and Medicaid Services. MLN Matters. Available at: <https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNMattersArticles/Downloads/mm8054.pdf>. Accessed February 2, 2016.
- Zou G. A modified Poisson regression approach to prospective studies with binary data. *Am J Epidemiol*. 2004;159(7):702–706.
- Ingram DD, Franco SJ. 2013 NCHS urban–rural classification scheme for counties. *Vital Health Stat 2*. 2014;(166):1–73.
- Spradling PR, Rupp L, Moorman AC, et al. Hepatitis B and C virus infection among 1.2 million persons with access to care: factors associated with testing and infection prevalence. *Clin Infect Dis*. 2012;55(8):1047–1055.
- Rosenberg SD, Goodman LA, Osher FC, et al. Prevalence of HIV, hepatitis B, and hepatitis C in people with severe mental illness. *Am J Public Health*. 2001;91(1):31–37.
- Moyer VA, US Preventive Services Task Force. Screening for hepatitis C virus infection in adults: US Preventive Services Task Force recommendation statement. *Ann Intern Med*. 2013;159(5):349–357.
- Himelhoch S, McCarthy JF, Ganoczy D, et al. Understanding associations between serious mental illness and hepatitis C virus among veterans: a national multivariate analysis. *Psychosomatics*. 2009;50(1):30–37.
- Druss BG, Marcus SC, Campbell J, et al. Medical services for clients in community mental health centers: results from a national survey. *Psychiatr Serv*. 2008;59(8):917–920.
- Amiel JM, Pincus HA. The medical home model: new opportunities for psychiatric services in the United States. *Curr Opin Psychiatry*. 2011;24(6):562–568.