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Mental Illness in Adults With HIV and HCV Infection: Indian Health Service, 2001–2020

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Abstract

Introduction: Mental health disorders (MHDs) and substance use disorders (SUDs) in people living with HIV, hepatitis C virus (HCV) infection, and HIV/HCV coinfection are common and result in significant morbidity. However, there are no national prevalence estimates of these comorbidities in American Indian and Alaska Native (AI/AN) adults with HIV, HCV infection, or HIV/HCV coinfection. This study estimates the prevalence of MHD and SUD diagnoses in AI/AN adults diagnosed with HIV, HCV infection, or HIV/HCV coinfection within the Indian Health Service (IHS).

Methods: In 2021, a cross-sectional study using data from the National Patient Information Reporting System was completed to identify MHD or SUD diagnoses in AI/AN adults with HIV, HCV infection, or HIV/HCV coinfection within the IHS during fiscal years 2001–2020. Logistic regression was used to compare the odds of MHD or SUD diagnoses, adjusting for age and sex.

Results: Of AI/AN adults diagnosed with HIV, hepatitis C virus infection, or HIV/HCV coinfection, the period prevalence of MHD or SUD diagnoses ranged from 57.2% to 81.1%. Adjusting for age and sex, individuals with HCV infection had higher odds of receiving a MHD diagnosis (AOR=1.57; 95% CI=1.47, 1.68) or SUD diagnosis (AOR=3.40; 95% CI=3.18, 3.65)

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CREDIT AUTHOR STATEMENT

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SUPPLEMENTAL MATERIAL

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than those with HIV, and individuals with HIV/HCV coinfection had higher odds of receiving a MHD diagnosis (AOR=1.60; 95% CI=1.35, 1.89) or SUD diagnosis (AOR=2.81; 95% CI=2.32, 3.41) than those with HIV.

Conclusions: MHD and SUD diagnoses were common in AI/AN adults diagnosed with HIV, HCV infection, or HIV/HCV coinfection, highlighting the need for culturally appropriate screening and treatment programs sensitive to the diverse strengths of AI/AN populations and structural challenges they endure.

INTRODUCTION

Mental health disorders (MHDs) and substance use disorders (SUDs) in people living with HIV, hepatitis C virus (HCV) infection, and HIV/HCV coinfection are common.[1–7] However, there are limited data on the prevalence of SUDs and MHDs in American Indian and Alaska Native (AI/AN) adults living with HIV, HCV infection, and HIV/HCV coinfection.

AI/AN people have the highest rate of acute HCV infection among all racial/ethnic groups, and the rate has increased from 0.7 per 100,000 to 3.6 per 100,000 from 2004 to 2019.[8] The annual number of new diagnoses of HIV among AI/AN adults has increased by 18% from 2015 to 2019.[9] Moreover, racial misclassification in surveillance data has led to underestimating diagnoses in AI/AN populations.[10–13] Disparities in illness are likely driven by structural and social factors, such as poverty and unemployment,[14] which are influenced by historical trauma, dispossession, and racism.[15,16]

Despite inequities in MHDs and SUDs among AI/AN adults, the prevalence of these conditions in those living with HIV and HCV infection remains unclear.[17,18] Studies of HIV and comorbid MHDs and SUDs have been limited by small sample size and have not included patients receiving care in Indian Health Service (IHS) facilities.[19] A review of IHS electronic health record data revealed that >25% of AI/AN young adults with HCV infection had a concurrent opioid use disorder, although this analysis excluded adults aged >35 years.[20] Less data exist on co-occurring mental illness and SUDs in AI/AN adults with HIV/HCV coinfection.

There is growing recognition that ending the HIV and HCV epidemics requires addressing MHDs and SUDs,[21,22] and the HIV and Viral Hepatitis National Strategic Plans for the U.S. identify AI/AN people as priority populations.[23,24] Therefore, assessing the burden of comorbidities in AI/AN adults with HIV, HCV infection, and HIV/HCV coinfection has important public health implications.

The objectives of this cross-sectional study were to estimate and compare the prevalence of co-occurring SUD and MHD diagnoses among AI/AN adults diagnosed with HIV, HCV infection, and HIV/HCV coinfection receiving care in the IHS, a national healthcare delivery system dedicated to serving more than 2.56 million AI/AN people.[25]

METHODS

Study Sample

Deidentified inpatient, outpatient, and emergency department (ED) records from the IHS National Patient Information Reporting System were used.[26] IHS provides services to AI/AN individuals at 170 IHS and tribally managed service units and 41 Urban Indian Organizations through 12 Area offices.[25]

A retrospective analysis of National Patient Information Reporting System data from federal fiscal years 2001–2020 was completed. AI/AN adults (aged ≥18 years) diagnosed with HIV, HCV infection, and HIV/HCV coinfection were identified using the International Classification of Diseases, Ninth Revision, Clinical Modification (before October 1, 2015) and ICD-10-CM (beginning on October 1, 2015) diagnostic codes (Appendix Table 1, available online).[27,28] A *diagnosis of HIV* was defined as the first adult inpatient, outpatient, or ED encounter with an HIV diagnosis with no current, previous, or subsequent diagnosis of HCV infection from 2001 to 2020. *HCV infection* was defined as the first adult encounter with an HCV infection diagnosis and no current, previous, or subsequent diagnosis of HIV as an adult from 2001 to 2020. An *HIV/HCV coinfection diagnosis* was defined as the first adult encounter considered a coinfection, meaning that both HIV and HCV infections were diagnosed as an adult during 2001–2020 but not necessarily on the same visit. It was not possible to account for HCV infection treatment or clearance in this data set.

The study relied on preexisting deidentified data and was determined public health practice by IHS and the Centers for Disease Control and Prevention. STROBE reporting guidelines were followed.[29]

Measures

Data were stratified by sex, age group, and region. Regions were based on the 12 geographic IHS areas (Appendix Figure 1, available online). Data for the West region was only available for outpatient visits owing to the lack of IHS or tribal hospitals and EDs in the region and the incompleteness of contract care data.

Common MHD diagnoses (anxiety, depression, bipolar disorder, schizophrenia, and post-traumatic stress disorder) and *SUD diagnoses* (alcohol use disorder, tobacco use disorder, stimulant use disorder, opioid use disorder, and cannabis use disorder) were defined using the International Classification of Diseases, Ninth Revision, Clinical Modification or ICD-10-CM codes (Appendix Table 1, available online)[27,28] on the basis of previously published methods.[30] *Adults with HIV, HCV infection, or HIV/HCV coinfection* were defined as having a co-occurring MHD or SUD diagnosis if they had the diagnosis at any point as an adult during the study period.

Statistical Analysis

In 2021, a cross-sectional analysis was completed. The number of HIV, HCV infection, and HIV/HCV coinfection diagnoses and rate per 100,000 AI/AN adults were calculated overall and by sex, age group, and region. Sex, age, and region were taken from the first

visit with an HIV, HCV infection, or HIV/HCV coinfection diagnosis. The denominator for the rates was the annual IHS user population, aggregated from 2001 to 2020, and included registered AI/AN patients with at least 1 direct or contract inpatient, outpatient, ED, or dental visit during the previous 3 federal fiscal years. The proportion of people with MHD and SUD diagnoses (i.e., period prevalences) were identified among patients diagnosed with HIV, HCV infection, and HIV/HCV coinfection overall and by sex, age group, and region (extracted from initial HIV, HCV infection, or HIV/HCV coinfection diagnosis). Logistic regression was used to calculate age and sex AORs and 95% CIs comparing the odds of MHDs and SUDs between those with HIV, HCV infection, and HIV/HCV coinfection. Analysis was performed using SAS statistical software (version 9.4) (SAS Institute Inc, Cary, NC), and statistical significance was determined as $p<0.05$. Numerators <5 and associated percentages were suppressed. If this suppression did not prevent the calculation of these numerators, the next smallest numerators were also suppressed.

RESULTS

In this study of 1,788,932 AI/AN adults with at least 1 hospitalization, ED, or outpatient visit, 4,170 were diagnosed with HIV, 43,996 were diagnosed with HCV infection, and 752 were diagnosed with HIV/HCV coinfection. Most diagnoses (HIV, 69.4%; HCV infection, 52.5%; HIV/HCV coinfection, 65.4%) were among men. The highest rate of HIV diagnoses (30.3 per 100,000) was among those aged 30–39 years, whereas the highest rate of HCV infection (371.7 per 100,000) and HIV/HCV coinfection (7.7 per 100,000) was among those aged 40–49 years. Geographically, the highest rate of HIV diagnoses was in the Southwest (26.7 per 100,000), whereas the highest rate of HCV infection was in the West (330.2 per 100,000). The comorbid HIV/HCV coinfection rate was highest in Alaska (4.9 per 100,000). The rates of HIV infection (11.2 per 100,000) and HIV/HCV coinfection (1.9 per 100,000) were lowest in the Northern Plains East, whereas the rate of HCV infection (112.0 per 100,000) was lowest in the Southwest (Table 1). Median time (first quartile to third quartile) between first and last visit for any reason during 2001–2020 did not vary substantially between groups (HIV, 14 [7–19] years; HCV infection, 15 [10–19] years; HIV/HCV coinfection, 14 [8–18] years).

The prevalence of any MHD diagnosis was 57.2% in those with HIV and 69.1% in those with HCV infection and HIV/HCV coinfection. When evaluating specific MHDs, AI/AN adults with HCV infection had the highest prevalence of anxiety (49.0% vs 35.6% and 44.0% in HIV and HIV/HCV coinfection, respectively) and bipolar disorder (12.0% vs to 7.0% and 11.4% in HIV and HIV/HCV coinfection, respectively) diagnoses. AI/AN adults with HIV/HCV coinfection had the highest prevalence of depression (59.4% vs 46.4% and 57.6% in HIV and HCV infections, respectively), schizophrenia (7.8% vs 2.8% and 4.8% in HIV and HCV infections, respectively), and post-traumatic stress disorder (15.7% vs 9.1% and 15.4% in HIV and HCV infections, respectively) diagnoses (Table 2).

Females had the highest prevalence of any MHD diagnosis, with a prevalence of 66.1% in those with HIV, 79.6% in those with HCV infection, and 81.9% in those with HIV/HCV coinfection, compared with a prevalence of 53.2%, 59.6%, and 62.4% in males, respectively. In age groups with sufficient data, individuals aged 40–49 years had the highest prevalence

(60.0%) of any MHD diagnosis among those with HIV, whereas those aged 30–39 years had the highest prevalence (75.3%) of any MHD diagnosis among those with HCV infection. Finally, patients aged 18–29 years had the highest prevalence (75.8%) of any MHD diagnosis among those with HIV/HCV coinfection (Table 3).

Northern Plains West had the highest prevalence of any MHD diagnosis in adults with HIV (68.5%), whereas the East and Southwest had the lowest prevalence (53.4%). The East had the highest prevalence of any MHD diagnosis (78.1%) in adults with HCV infection, whereas the Southwest had the lowest prevalence (60.5%). Finally, the Northern Plains East had the highest prevalence of any MHD diagnosis (84.6%) among those with HIV/HCV coinfection, whereas the East had the lowest prevalence (54.5%) (Table 3).

Adjusting for age and sex, those with HIV/HCV coinfection and HCV infection had higher odds of receiving any MHD than those with HIV (HIV/HCV coinfection versus HIV, AOR=1.60; 95% CI=1.35, 1.89; HCV infection versus HIV, AOR=1.57; 95% CI=1.47, 1.68). Although there was no difference in receiving any MHD diagnosis in those with HIV/HCV coinfection compared with that in those with HCV infection (AOR=1.03; 95% CI=0.88, 1.21), those with HIV/HCV coinfection were less likely to have anxiety and more likely to have schizophrenia (anxiety, AOR=0.83; 95% CI=0.71, 0.96; schizophrenia, AOR=1.53; 95% CI=1.16, 2.00) (Table 2). The prevalence of specific MHDs stratified by demographics is presented in Appendix Table 2 (available online).

The prevalence of any SUD diagnosis was 59.3% in those with HIV, 81.1% in those with HCV infection, and 80.9% in those with HIV/HCV coinfection. AI/AN adults diagnosed with HCV infection had the highest prevalence of tobacco use disorder (57% vs 33.4% and 47.6% in HIV infection and HIV/HCV coinfection, respectively) and opioid use disorder diagnoses (20.6% vs 4.7% and 17% in HIV infection and HIV/HCV coinfection, respectively). Adults with HIV/HCV coinfection had the highest prevalence of alcohol use disorder (60.6% vs 39.9% and 52.9% in HIV and HCV infections, respectively), stimulant use disorder diagnoses (34.3% vs 13.4% and 28.4% in HIV and HCV infections, respectively), and cannabis use disorder diagnoses (21.7% vs 12.6% and 19.6% in HIV and HCV infections, respectively) (Table 2).

The prevalence of any SUD diagnosis was 59.3% in both females and males with HIV. For those with HCV infection, the prevalence of any SUD diagnosis was 80% in females and 82.1% in males, whereas the prevalence was 84.2% among females and 79.1% among males in those with HIV/HCV coinfection. Across age groups for which there was sufficient data, adults aged 30–39 years had the highest prevalence of any SUD diagnosis in those with HIV or HCV infection, whereas adults aged 18–29 years had the highest prevalence of any SUD in those with HIV/HCV coinfection (Table 4).

Alaska had the highest prevalence of any SUD diagnoses among those diagnosed with HIV (82.2%), HCV infection (89.7%), and HIV/HCV coinfection (94.6%). The Southern Plains had the lowest prevalence of any SUD diagnoses in individuals with HIV (49.7%). In comparison, the Southwest (76.2%) and the Northern Plains West (70.7%) had the lowest prevalence of SUD in HCV infection and HIV/HCV coinfection, respectively (Table 4).

After adjusting for age and sex, individuals with HCV infection and HIV/HCV coinfection had higher odds of receiving any SUD diagnosis than those with HIV (HCV infection versus HIV, AOR=3.40; 95% CI=3.18, 3.65; HIV/HCV coinfection versus HIV, AOR=2.81; 95% CI=2.32, 3.41). Those with HIV/HCV coinfection had lower odds of receiving any SUD diagnosis than those with HCV infection (AOR=0.82; 95% CI=0.68, 0.98), including tobacco use disorder (AOR=0.67; 95% CI=0.58, 0.78) and opioid use disorder (AOR=0.69; 95% CI=0.57, 0.84), but had higher odds of receiving an alcohol use disorder diagnosis (AOR=1.17; 95% CI=1.01, 1.36) (Table 2). The prevalence of specific SUDs stratified by demographics is presented in Appendix Table 3 (available online).

DISCUSSION

This analysis used national IHS data to compare the prevalence of SUD and MHD diagnoses among AI/AN adults with HIV, HCV infection, and HIV/HCV coinfection diagnoses receiving care within the IHS. The prevalence of receiving any MHD diagnosis from 2001 to 2020 was 57.2%–69.1%, and the prevalence of receiving any SUD diagnosis was 59.3%–81.1%. Adjusting for age and sex, individuals with HCV infection or HIV/HCV coinfection had higher odds of receiving any MHD or SUD diagnosis than those with HIV.

These findings extend the limited literature on prevalence estimates of SUD and MHD in AI/AN adults with HIV and HCV infection, indicating that both are common in this population.[19,31] Data from the Medical Monitoring Project found that 27% of surveyed AI/AN adults living with HIV had symptoms of depression, and 37% had self-reported drug use over the previous 2 weeks and 12 months.[19] In comparison, adults in the current study had a greater prevalence of depression and substance use, although these findings included diagnoses at any point from 2001 to 2020 and were not self-reported.[19] Another study of AI/AN adults with HCV infection treated with direct-acting antivirals found that 25% of the participants had a psychiatric illness and that 22.6% had a SUD.[31] Although the current study found a greater prevalence of MHD and SUD comorbidity, the previous analysis was based on the presence of active disease by chart review.[31] There are no previous studies documenting the prevalence of MHDs and SUDs in AI/AN adults with HIV/HCV coinfection.

SUD and MHD diagnoses were more prevalent in those with HCV infection and HIV/HCV coinfection diagnoses. Administrative data do not account for differences in receiving comprehensive care between those with HIV and those with HCV infection, perhaps lending to apparent differences in prevalence. Still, this study finds results consistent with previous examination of comorbid MHD prevalence and substance use among U.S. veterans.[32]

The current study did not compare the prevalence of SUD and MHD diagnoses between AI/AN adults with HIV, HCV infection, or HIV/HCV coinfection and those without. However, for adults without HIV, HCV infection, or HIV/HCV coinfection receiving care in the IHS system from 2001 to 2020, only 37.0% received any MHD diagnosis, and only 34.7% received any SUD diagnosis (Appendix Table 4, available online). Moreover, the prevalence of comorbidities in the current study was higher than the expected lifetime prevalence in AI/AN people estimated from the 2000–2001 National Epidemiological

Survey on Alcohol and Related Conditions.[17,33] Lifetime prevalence of SUDs in the National Epidemiological Survey on Alcohol and Related Conditions population was similar to that in the current study.[17] Taken together, these data suggest that the rates of co-occurring SUDs and MHDs are especially high in this population.

Previous studies in AI/AN adults have linked structural inequities, such as poverty, hyperincarceration, and historical trauma to infection[14]; substance use[34]; and mental illness.[35] Because AI/AN populations endure disproportionate rates of structural injustice,[36] high rates of comorbidities among AI/AN adults with HIV, HCV infection, and HIV/HCV coinfection are not surprising. These data have important implications for public health practice. Indeed, SUDs and MHDs are significant risk factors for HIV and HCV infection[37] and negatively impact treatment adherence and clinical outcomes for people living with HIV and HCV infection.[38,39] Similarly, untreated HIV or HCV infection may worsen SUD and MHD outcomes.[40,41] The notable prevalence of HIV and HCV infection in AI/AN adults in the current analysis implicates screening and treating MHDs and SUDs as important primary and secondary prevention measures for HIV and HCV infection and vice versa.[21–24] Evidence-based integrated treatment programs addressing mental health and substance use in people with HIV and HCV infection[42,43] should be implemented and adapted to a strength-based model appropriate for specific tribes given the heterogeneity among AI/AN populations.

On the basis of the findings of this study, screening and treatment programs should adapt to the needs of males and females. Although MHDs were generally more prevalent in AI/AN females across subgroups in this study, consistent with previous reports in AI/AN and non-Hispanic White adults,[17,44] males are less likely to seek mental health services than females.[45] Moreover, there were no notable differences in the prevalence of SUDs between sexes across subgroups. Even though data were not available for sexual and gender minorities, including Two-Spirit people (the dataset included information only on sex), other reports have established these groups as priority populations.[23,24]

Depression and anxiety are the most prevalent neuropsychiatric comorbidities in people with HIV and HCV infection,[1,46] consistent with this study's findings. Although alcohol and tobacco were the most common SUDs across groups in the current analysis, the syndemic of opioid use, HIV, and HCV infection[47] and the rising rates of opioid use disorder among AI/AN adults[20] supports an emphasis on opioid use disorder services. Finally, as is true in the U.S.,[48] MHD and SUD diagnoses varied geographically in this study; however, the analysis did not account for different screening practices between regions, so caution should be taken when interpreting the rates of diagnoses between regions.

This is the first study to document MHD and SUD comorbidities in AI/AN adults with HIV, HCV infection, and HIV/HCV coinfection within IHS. These data highlight the need for longitudinal analyses evaluating screening and treatment initiatives for diverse AI/AN populations.

Limitations

This study had several limitations. First, *diagnoses* were defined using the International Classification of Diseases, Clinical Modification codes and not laboratory data. *HIV/HCV coinfecti*on was defined as the presence of HIV and HCV infection diagnoses during the entire study period. Given the advent of direct-acting antivirals in 2013[49] and that up to 50% of individuals are expected to clear acute HCV infection spontaneously,[50–52] this might overestimate the number of HIV/HCV coinfections. Second, only the most common MHD and SUD diagnoses were included, and multiple diagnoses were not assessed, potentially underestimating the total burden of mental illness and SUDs in this population. Third, these results should not be extrapolated to AI/AN children or AI/AN people who do not receive care through the IHS system. Only an estimated 2.56 million[25] of the 5.2 million people who self-identify as AI/AN in the U.S.[53] receive care through IHS. Finally, AI/AN people represent a culturally diverse and heterogeneous group of individuals, which larger, regional analysis may not capture.

CONCLUSIONS

This analysis shows that MHD and SUD diagnoses were common in AI/AN adults diagnosed with HIV, HCV infection, and HIV/HCV coinfection. These findings highlight the need for culturally appropriate screening and treatment programs sensitive to the diverse strengths of AI/AN populations and the structural challenges they endure.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

HIV, HCV, and HIV/HCV Infection in AI/AN Adults.

Demographics	HIV *n* (rate per 100,000)[a]	HCV infection *n* (rate per 100,000)[b]	HIV/HCV coinfection *n* (rate per 100,000)[c]
Total	4,170 (20.5)	43,996 (216.8)	752 (3.7)
Sex			
Female	1,274 (11.7)	20,898 (192.0)	260 (2.4)
Male	2,896 (30.8)	23,098 (245.5)	492 (5.2)
Age, years			
18–29	1,238 (19.6)	7,515 (119.2)	149 (2.4)
30–39	1,233 (30.3)	10,448 (256.7)	227 (5.6)
40–49	989 (28.0)	13,109 (371.7)	272 (7.7)
50–59	445 (15.1)	9,316 (315.7)	82 (2.8)
60–64	129 (11.8)	2,054 (188.3)	14 (1.3)
≥65	136 (5.8)	1,554 (66.2)	8 (0.3)
Region			
Alaska	422 (22.5)	4,560 (242.8)	92 (4.9)
East	133 (20.5)	1,679 (259.0)	22 (3.4)
Northern Plains East	152 (11.2)	2,887 (213.2)	26 (1.9)
Northern Plains West	413 (16.7)	6,861 (277.6)	92 (3.7)
Southern Plains	770 (16.6)	12,113 (261.7)	125 (2.7)
Southwest	1,815 (26.7)	7,628 (112.0)	298 (4.4)
West[d]	465 (18.6)	8,268 (330.2)	97 (3.9)

[a]The number of people diagnosed with HIV as an adult with no current, previous, or subsequent diagnosis of HCV infection as an adult in the IHS system from federal fiscal years 2001–2020. Sex, age, and region are taken from the first adult visit with an HIV diagnosis in the IHS system.

[b]The number of people diagnosed with HCV infection as an adult with no current, previous, or subsequent diagnosis of HIV as an adult in the IHS system from federal fiscal years 2001–2020. Sex, age, and region are taken from the first adult visit with an HCV infection diagnosis in the IHS system.

[c]The number of people diagnosed with both HIV and HCV infection as an adult during federal fiscal years 2001–2020 but not necessarily on the same visit. Sex, age, and region are taken from the first visit considered a coinfection.

[d]The West region should be interpreted with caution owing to the lack of IHS and tribal hospitals in the West and incomplete contract care data. AI/AN, American Indian/Alaska Native; HCV, hepatitis C virus; IHS, Indian Health Service.

Table 2.

Mental Health and Substance Use Disorders Among AI/AN Adults With HIV, HCV, or HIV/HCV

Comorbid condition	HIV[a,b] (*n*=4,170), *n* (%)	HCV infection[a,c] (*n*=43,996), *n* (%)	HIV/HCV Coinfection[a,d] (*n*=752), *n* (%)	HCV infection versus HIV,[e] AOR[f] (95% CI)	HIV/HCV coinfection versus HIV,[e] AOR[f] (95% CI)	HIV/HCV coinfection versus HCV infection,[e] AOR[f] (95% CI)
Mental health disorder						
Any[g]	2,384 (57.2)	30,385 (69.1)	520 (69.1)	1.57 (1.47, 1.68)	1.60 (1.35, 1.89)	1.03 (0.88, 1.21)
Anxiety disorder	1,483 (35.6)	21,566 (49.0)	331 (44.0)	1.67 (1.56, 1.79)	1.38 (1.18, 1.63)	0.83 (0.71, 0.96)
Bipolar disorder	291 (7.0)	5,293 (12.0)	86 (11.4)	1.84 (1.63, 2.09)	1.64 (1.27, 2.12)	0.92 (0.73, 1.15)
Depressive disorder	1,936 (46.4)	25,321 (57.6)	447 (59.4)	1.41 (1.32, 1.51)	1.61 (1.37, 1.89)	1.14 (0.98,1.33)
Schizophrenia	116 (2.8)	2,109 (4.8)	59 (7.8)	1.94 (1.60, 2.35)	2.92 (2.10, 4.06)	1.53 (1.16, 2.00)
Posttraumatic stress disorder	378 (9.1)	6,774 (15.4)	118 (15.7)	1.73 (1.55, 1.94)	1.82 (1.45, 2.29)	1.05 (0.86, 1.28)
Substance use disorder						
Any[h]	2,472 (59.3)	35,670 (81.1)	608 (80.9)	3.40 (3.18, 3.65)	2.81 (2.32, 3.41)	0.82 (0.68, 0.98)
Alcohol use disorder	1,663 (39.9)	23,292 (52.9)	456 (60.6)	1.92 (1.80, 2.05)	2.27 (1.93, 2.67)	1.17 (1.01, 1.36)
Tobacco use disorder	1,394 (33.4)	25,096 (57.0)	358 (47.6)	2.55 (2.38, 2.73)	1.73 (1.47, 2.02)	0.67 (0.58, 0.78)
Opioid use disorder	195 (4.7)	9,082 (20.6)	128 (17.0)	6.85 (5.91, 7.94)	4.40 (3.44, 5.62)	0.69 (0.57, 0.84)
Stimulant use disorder	559 (13.4)	12,483 (28.4)	258 (34.3)	3.23 (2.94, 3.55)	3.56 (3.00, 4.26)	1.14 (0.98, 1.34)
Cannabis use disorder	527 (12.6)	8,623 (19.6)	163 (21.7)	2.09 (1.90, 2.31)	2.08 (1.70, 2.54)	1.02 (0.85, 1.22)

[a] Numerator is those with the specified MHD or SUD diagnosis at any point as an adult during the entire study period, taken from the population of people in the denominator.

[b] The denominator is the number of people with a diagnosis of HIV as an adult with no current, previous, or subsequent diagnosis of HCV infection as an adult in the IHS system from federal fiscal years 2001–2020.

[c] The denominator is the number of people with a diagnosis of HCV infection as an adult with no current, previous, or subsequent diagnosis of HIV as an adult in the IHS system from federal fiscal years 2001–2020.

[d] The denominator is the number of people who were diagnosed with both HIV and HCV infection as an adult at some point during the federal fiscal years 2001–2020 (did not have to be diagnosed with both on the same visit).

[e] For each AOR, the second condition is the reference group.

[f] ORs adjusted for age and sex.

[g] Has at least 1 of the mental health disorder diagnoses listed in this table.

[h] Has at least 1 of the substance use disorder diagnoses listed in this table.

AI/AN, American Indian/Alaska Native; HCV, hepatitis C virus; IHS, Indian Health Service; MHD, mental health disorder; SUD, substance use disorder.

Table 3.

Comorbid Mental Health Disorders in HIV, HCV, and HIV/HCV-Infected AI/AN Adults

	Any MHD[a]		
Demographics	**HIV,[b,c] *n* (%)**	**HCV infection,[b,d] *n* (%)**	**HIV/HCV coinfection,[b,e] *n* (%)**
Sex			
Female	842 (66.1)	16,626 (79.6)	213 (81.9)
Male	1,542 (53.2)	13,759 (59.6)	307 (62.4)
Age, years			
18–29	675 (54.5)	5,507 (73.3)	113 (75.8)
30–39	733 (59.4)	7,872 (75.3)	150 (66.1)
40–49	593 (60.0)	9,236 (70.5)	197 (72.4)
50–59	240 (53.9)	5,869 (63.0)	47 (57.3)
60–64	70 (54.3)	1,131 (55.1)	_[f]
≥65	73 (53.7)	770 (49.5)	_[f]
Region			
Alaska	283 (67.1)	3,126 (68.6)	65 (70.7)
East	71 (53.4)	1,311 (78.1)	12 (54.5)
Northern Plains East	87 (57.2)	2,154 (74.6)	22 (84.6)
Northern Plains West	283 (68.5)	5,007 (73.0)	67 (72.8)
Southern Plains	433 (56.2)	8,705 (71.9)	86 (68.8)
Southwest	969 (53.4)	4,616 (60.5)	206 (69.1)
West[g]	258 (55.5)	5,466 (66.1)	62 (63.9)

[a]Has at least 1 of the following mental health disorder diagnoses: anxiety, depression, bipolar disorder, schizophrenia, and post-traumatic stress disorder.

[b]Numerator is those with an MHD diagnosis at any point as an adult during the entire study period, taken from the number of people in the denominator.

[c]The denominator is the number of people in each category (e.g., overall, female, male) with a diagnosis of HIV as an adult with no current, previous, or subsequent diagnosis of HCV infection as an adult in the IHS system from federal fiscal years 2001–2020. Sex, age, and region are taken from the first visit with an HIV diagnosis in the IHS system for numerators and denominators.

[d]The denominator is the number of people in each category with a diagnosis of HCV infection as an adult with no current, previous, or subsequent diagnosis of HIV as an adult in the IHS system from federal fiscal years 2001–2020. Sex, age, and region are taken from the first visit with an HCV infection diagnosis in the IHS system for numerators and denominators.

[e]The denominator is the number of people in each category who were diagnosed with both HIV and HCV infection as an adult at some point during the federal fiscal years 2001–2020 (did not have to be diagnosed with both on the same visit). Sex, age, and region are taken from the first visit considered an HIV/HCV coinfection for the numerator and denominator.

[f]For patient privacy, numerators <5 and associated percentages were suppressed. If suppression <5 did not prevent the calculation of these numerators, the cells with the next smallest numerator were also suppressed.

[g]The West region should be interpreted with caution owing to the lack of IHS and tribal hospitals in the West and incomplete contract care data. AI/AN, American Indian/Alaska Native; HCV, hepatitis C virus; IHS, Indian Health Service; MHD, mental health disorder.

Table 4.

Comorbid Substance Use Disorders in HIV−, HCV−, and HIV/HCV-Infected AI/AN Adults

	Any SUD[a]		
Demographics	**HIV,[b,c] *n* (%)**	**HCV infection,[b,d] *n* (%)**	**HIV/HCV coinfection,[b,e] *n* (%)**
Sex			
Female	755 (59.3)	16,711 (80.0)	219 (84.2)
Male	1,717 (59.3)	18,959 (82.1)	389 (79.1)
Age, years			
18–29	726 (58.6)	6,314 (84.0)	130 (87.2)
30–39	771 (62.5)	9,154 (87.6)	189 (83.3)
40–49	597 (60.4)	10,995 (83.9)	218 (80.1)
50–59	264 (59.3)	7,131 (76.5)	59 (72.0)
60–64	63 (48.8)	1,333 (64.9)	_[f]
≥65	51 (37.5)	743 (47.8)	_[f]
Region			
Alaska	347 (82.2)	4,089 (89.7)	87 (94.6)
East	67 (50.4)	1,476 (87.9)	18 (81.8)
Northern Plains East	82 (53.9)	2,444 (84.7)	23 (88.5)
Northern Plains West	276 (66.8)	5,883 (85.7)	65 (70.7)
Southern Plains	383 (49.7)	9,561 (78.9)	93 (74.4)
Southwest	1,083 (59.7)	5,811 (76.2)	249 (83.6)
West[g]	234 (50.3)	6,406 (77.5)	73 (75.3)

[a]Has at least 1 of the following substance use disorder diagnoses: alcohol use disorder, tobacco use disorder, stimulant use disorder, opioid use disorder, and cannabis use disorder.

[b]Numerator is those with a SUD diagnosis at any point as an adult during the entire study period, taken from the population of people in the denominator.

[c]The denominator is the number of people in each category (e.g., overall, female, male) with a diagnosis of HIV as an adult with no current, previous, or subsequent diagnosis of HCV infection as an adult in the IHS system from the federal fiscal years 2001–2020. Sex, age, and region are taken from the first visit with an HIV diagnosis in the IHS system for numerators and denominators.

[d]The denominator is the number of people in each category with a diagnosis of HCV infection as an adult with no current, previous, or subsequent diagnosis of HIV as an adult in the IHS system from federal fiscal years 2001–2020. Sex, age, and region are taken from the first visit with an HCV infection diagnosis in the IHS system for numerators and denominators.

[e]The denominator is the number of people in each category who were diagnosed with both HIV and HCV infection as an adult at some point during the federal fiscal years 2001–2020 (did not have to be diagnosed with both on the same visit). Sex, age, and region are taken from the first visit considered an HIV/HCV coinfection for the numerator and denominator.

[f]For patient privacy, numerators <5 and associated percentages were suppressed. If suppression <5 did not prevent the calculation of these numerators, the cells with the next smallest numerator were also suppressed.

[g]The West region should be interpreted with caution owing to the lack of IHS and tribal hospitals in the West and incomplete contract care data. AI/AN, American Indian/Alaska Native; HCV, hepatitis C virus; IHS, Indian Health Service; SUD, substance use disorder.