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Hepatitis B and Hepatitis C among Adults on Probation or Parole in the United States: 2015–2018

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Abstract

Background.—Viral hepatitis is highly prevalent in U.S. prison populations, but prevalence has not been described among adults on probation/parole.

Methods.—National Survey on Drug Use and Health data from 2015–2018 were pooled to estimate the prevalence of self-reported diagnosed hepatitis B or hepatitis C among adults reporting past-year parole vs. past-year probation only.

Results.—About 6.4% of adults on parole reported a diagnosis of hepatitis B or hepatitis C, which was significantly higher than adults on probation only (3.2%). The prevalence for both these groups was significantly higher than adults not on probation/parole (1.3%).

Conclusions.—Adults on probation/parole were more likely to self-report a medical diagnosis of hepatitis B or hepatitis C compared with adults not on probation/parole. This population may be challenging to reach, but viral hepatitis interventions could improve the health of a vulnerable group and prevent transmission from prison populations to the community.

Keywords

Probation; parole; hepatitis C; hepatitis B; viral hepatitis

Approximately 2.2 million people incarcerated in U.S. federal and state prisons and jails, at any given time,[1] are at increased risk for infectious diseases, including hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) infections.[2] Hepatitis C is the most common health concern in incarcerated populations,[3] with prevalence ranging from 12% to 35%.[4] This finding led the Institute of Medicine (IOM) to recommend, "The Centers for Disease Control and Prevention and the Department of Justice should create an initiative to foster partnerships between health departments and corrections systems to ensure the availability of comprehensive viral hepatitis services for incarcerated people."[4[p.186]]

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While transmission of HBV and HCV during incarceration has been well researched, subsequent release to the community on parole or a probation sentence represents a point at which public health action could prevent transmission of viral hepatitis to the general U.S. population. By the end of 2016, an estimated 4,537,100 adults in the U.S. were under some type of community supervision—either parole or probation.[5] This represented approximately one in 55 adults under community supervision at year-end.[5]

While evidence suggests a high prevalence of viral hepatitis in people on parole or probation, to our knowledge, it has never been measured. In a Rhode Island pilot study, 9% of participants in two probation and parole offices who received a rapid hepatitis C antibody test had a positive test result.[6] While smaller studies provide great insight, a large-scale national study could be used to justify use of resources if adults on probation or parole have a higher prevalence of viral hepatitis compared with the general population.

Much can be gained from identifying viral hepatitis among people on probation or parole. Prior to release, inmates could receive some of the same interventions that are currently in place for HIV—in 2015, all but six states offered HIV testing at prison discharge and all but one offered it at intake.[7] Vaccination and screening for hepatitis B could be offered concurrently with hepatitis C and HIV screening, followed by enrollment in care and community referrals for those who are infected. Furthermore, facilities such as drug treatment centers or emergency departments may have frequent contact with those on probation or parole and could develop protocols for identification and follow-up. In this analysis, U.S. nationwide survey data were analyzed 1) to determine the prevalence of self-reported hepatitis B and/or hepatitis C among adults who are living in the community on probation or parole; and 2) to understand factors that may create challenges or provide opportunities for hepatitis B and hepatitis C prevention, testing, and treatment.

Methods

We analyzed 2015–2018 National Survey on Drug Use and Health (NSDUH) public use files maintained by the Substance Abuse and Mental Health Services Administration (SAMHSA).[8] This is an annual household survey gathering information on the prevalence and patterns of alcohol, tobacco, and drug use from non-institutionalized U.S. civilians age 12 years or older. Detailed survey methods are available elsewhere,[9] but in short, NSDUH uses computer-assisted personal interviewing and audio computer-assisted self-interviewing to gather self-reported data on demographic characteristics and previous substance use at any point in the past (ever), and within the past year. Demographic variables included sex, age, race/ethnicity, employment, and insurance coverage.[10]

Generally, offenders are placed on probation in lieu of incarceration, while parole is conditional supervised release from prison.[5] A total of 3,940 adult NSDUH respondents reported they had been on probation at any time in the past year and 1,403 reported past-year parole. Each respondent was presented with a list of health conditions, and they were asked to select conditions that a doctor or other medical professional had ever told the respondent that they had. The questionnaire previously asked about *Hepatitis* but in 2015, it was revised to read *Hepatitis B or C*; no distinction was made between the two diseases. Because of the

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wording change, data collected prior to 2015 were not used in the analyses. Public use data were available through 2018, thus four years of data (2015–2018) were pooled to increase sample size.

Lifetime injection drug use was defined as ever using a needle to inject heroin, cocaine, stimulants, or any other drug. Respondents reporting lifetime injection drug use were then asked details about their last injection, including if they reused their own needle, reused another person's needle, or another person later reused their needle. All respondents were asked if they received any type of drug abuse treatment in the past 12 months, and if so, what type of facilities they accessed. Non-specialty treatment refers to treatment in emergency departments, private doctors' offices, prisons or jails, and self-help groups. Specialty treatment refers to treatment at a hospital (only as an inpatient), a drug rehabilitation facility (as an inpatient or outpatient), or a mental health center. Past year medical visits (for any reason) were assessed by asking respondents if they 1) visited a health professional in a doctor's office or clinic, or 2) were treated in an emergency room.

The main objective was to characterize three mutually exclusive subgroups: 1) people on parole in the past year (regardless of past-year probation status), 2) people on probation only (no parole) in the past year, and 3) people on neither parole or probation in the past year. All respondents on parole were considered as one group because those reporting both past-year parole and past-year probation made up the majority (75.6%) and viral hepatitis status did not differ from those on parole only. Weighted percentages were calculated among the total population and among subgroups. Respondents with missing parole/probation or viral hepatitis variables were excluded (<2% of the sample). Excluded respondents were more likely to be younger, male, and non-White, which may have resulted in an underestimation of those on parole/probation. The difference in distributions between subgroups were tested with Pearson chi-square test at an alpha level of .05. All analyses used SUDAAN® software (RTI International, 2012) to account for the complex sample design and appropriately weight the NSDUH sample.[11]

Results

An annual average of about 1.5 million adults living in U.S. communities in 2015–2018 (0.6%) reported being on parole in the past year, of whom 75.6% also reported past-year probation. An additional 2.9 million reported being on probation only and not paroled in the past year (1.2%).

An estimated 1.3% of adults reported a lifetime medical diagnosis of hepatitis B or hepatitis C. A diagnosis was twice as common among adults on parole (6.4%) compared with adults on probation only (3.2%, $p = .023$; Figure 1). The prevalence for both these groups was significantly higher than adults not on probation/parole (1.3%, $p < .001$ for each comparison).

A greater proportion of adults on parole were male compared with those on probation only, and young adults aged 18–25 years were more likely than adults in older age groups to be on

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probation only (Table 1). Compared with other groups, adults not on parole/probation were more likely to be non-Hispanic White and less likely to be unemployed.

More than one in five adults on parole (23.1%) and more than one in 10 adults on probation only (11.6%) reported lifetime injection drug use compared with 1.6% of adults not on parole/probation. Current use was more commonly reported among adults on parole compared with those on probation only and was least common among adults not on parole/probation. Past-year drug treatment was more commonly reported by adults on parole (19.4%) than by those on probation only (11.2%).

Adults on parole were the most likely to be uninsured (29.3%), followed by adults on probation only (21.7%) and, finally, adults not on probation/parole were the least likely to be uninsured (9.6%). In addition, adults on parole/probation were less likely to visit a health professional in a doctor's office or clinic and more likely to visit an emergency room compared with those not on parole/probation.

Discussion

Diagnosed hepatitis B and hepatitis C infections are at least three times more common among adults on probation or parole compared with the general population. These individuals live in the community and benefit from treatment and other prevention measures to protect their health, which also reduces the likelihood of transmission to others. While history of incarceration was not assessed, it is possible that adults on parole had higher rates of disease because they were more likely to be incarcerated than those on probation. Even those on probation have high rates of injection drug use and represent a segment of the population where interventions could affect viral hepatitis elimination activities.

As Binswanger et al. pointed out in 2016,[12] the viral hepatitis prevention focus directed toward correctional facilities may need to include community guidelines to address the post-release period. Existing state programs designed for adults living in the community on probation or parole could be leveraged to treat current viral hepatitis infections. States treating other transmissible diseases (e.g., HIV) in this population could use existing staff and infrastructure to offer viral hepatitis treatment and prevention services, including vaccination for hepatitis B.

Drug use among prison inmates, whether prior to or during incarceration, is a major concern in criminal justice facilities.[13] Prisoners may not have access to evidence-based substance abuse treatment while incarcerated. This problem becomes magnified if inmates are released from justice systems into communities with no strategies in place to avoid relapse to drug use.[13] A qualitative study of former prison inmates found inmates at higher risk of opioid overdose immediately after release from correctional facilities.[13] Our findings consistently showed both former and current injection drug use was more common among adults on probation or parole compared with the general population, although we were unable specifically to measure opioid use. As public health programs leverage various funding opportunities to combat the opioid crisis, they can harness the design of probation and parole programs, which mediate the transition of inmates or those otherwise involved in the justice

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system into the community.[14] If the right stakeholders are involved, this transition period could include structured substance abuse services and education about preventing infectious disease transmission.

Compared with people not on probation/parole in the past year, those on probation/parole were more likely to visit an emergency room but less likely to visit a health professional in a doctor's office or clinic. With emergency department encounters being relatively common, the emergency room may be the best opportunity to test for infectious diseases and provide hepatitis B vaccinations. This pattern is likely influenced by the lower rates of health care coverage found among those on parole/probation. Any improvement in the availability of health care coverage for adults on parole/probation might result in greater access to primary care, lessening this population's reliance on emergency departments.

Interventions that increase viral hepatitis awareness in drug treatment facilities will likely affect adults on probation and parole, due to the substantial proportion who receive services. In 2012, only 24% of substance abuse treatment facilities tested for hepatitis C and 22% tested for hepatitis B.[15] Universally offering testing in these settings could increase detection and provide linkage to care. For those testing positive for viral hepatitis, the same care model used for HIV patients could be replicated for those with viral hepatitis[15] and those co-infected with viral hepatitis and HIV could benefit from incorporation of viral hepatitis treatment and prevention services into the HIV care model.

Disease surveillance among people on parole and probation could continue because NSDUH is conducted annually and uniformly measures prevalence across the U.S. However, there are limitations to this data source. Small sample sizes limit statistical precision of hepatitis B and hepatitis C estimates, and multiple years of data typically are needed. Additionally, people who were recently institutionalized or had unstable housing are difficult to capture in population surveys. Sampling bias can occur when the population of interest is not part of the eligible sample during the entire year (lowering the probability of being sampled). Reporting bias may occur if respondents do not disclose recent drug use of drug treatment because of a drug conviction or if abstinence is a condition of their probation. Diagnosed hepatitis B or hepatitis C was included as a lifetime measure, but parole/probation was only measured in the past year. The NSDUH does not measure undiagnosed hepatitis B or hepatitis C, and the prevalence is likely underestimated in both the general population and in those on probation and parole. On the other hand, adults on probation or parole may be more likely to be tested for hepatitis B and hepatitis C compared with the general population, and some cases of hepatitis C may have been cured or resolved spontaneously. For these reasons, estimates in this study may not reflect the true pattern of prevalent viral hepatitis infections.

In conclusion, adults on probation/parole were more likely to self-report a medical diagnosis of hepatitis B or hepatitis C compared with adults not on probation/parole. This is the first study to provide national estimates for this population, and further studies can be designed to show infection rates using laboratory results and/or longitudinally assess when infection tends to occur in relation to incarceration. Adults on probation and parole may be challenging to reach, but hepatitis B and hepatitis C interventions could improve the health and wellbeing of a vulnerable group of people and prevent transmission from

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people institutionalized in prisons and jails to people in the community. States and local communities that currently provide services to this population are positioned to leverage these programs to provide hepatitis B and hepatitis C intervention and prevention services, and consequently have a substantial impact on reducing the viral hepatitis burden in their communities.

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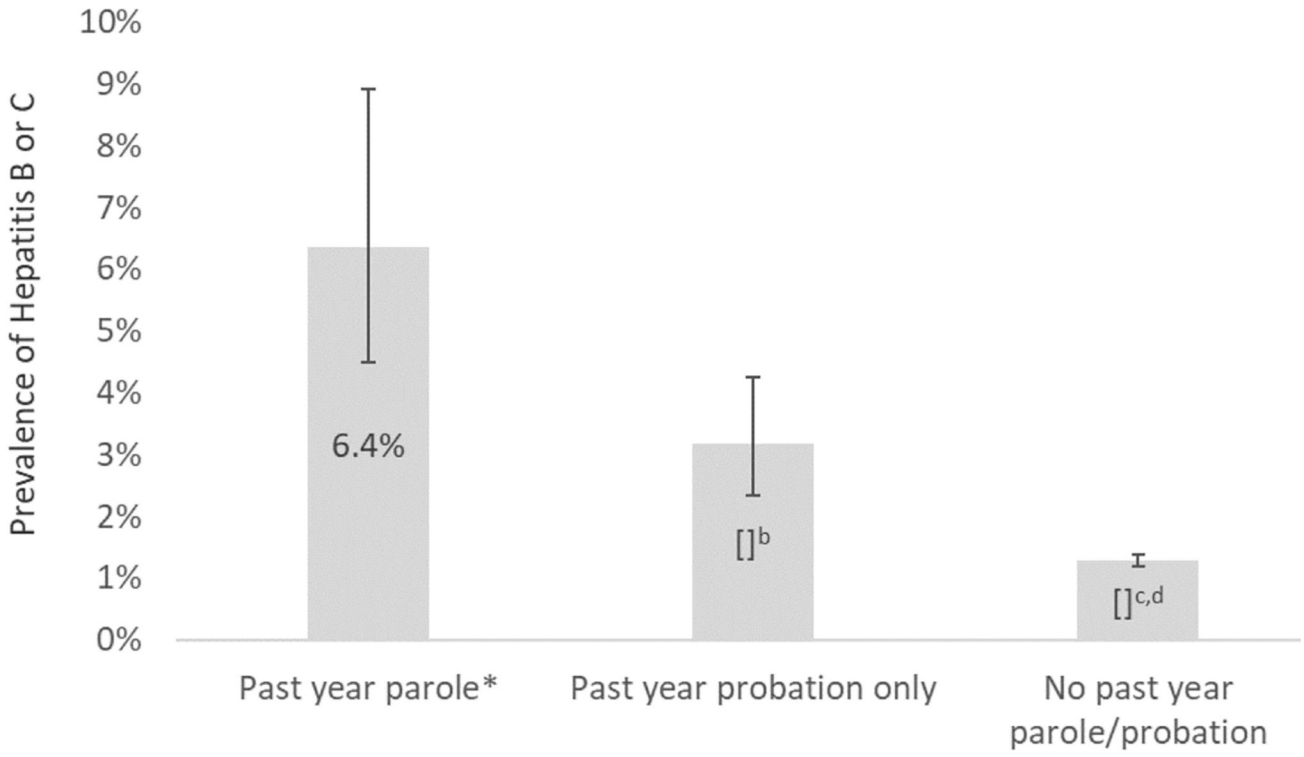

Figure 1.

Self-report of medical diagnosis of hepatitis B or hepatitis C among adults aged 18 years or older living in the community on probation/parole: NSDUH 2015–2018.

Notes

[a]May have also been on probation in past year.

[b] Significant difference between adults on parole and adults on probation only (Chi-square p-value < .05).

[c] Significant difference between adults on parole and adults not on parole/probation (Chi-square p-value < .05).

[d] Significant difference between adults on probation only and adults not on parole/probation (Chi-square p-value < .05).

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Table 1.

DEMOGRAPHIC CHARACTERISTICS, INJECTION DRUG USE, DRUG TREATMENT, AND HEALTH CARE ENCOUNTERS AMONG ADULTS AGED 18 YEARS OR OLDER LIVING IN THE COMMUNITY ON PROBATION/PAROLE: NSDUH 2015–2018

	Parole[a] (n=1,403) % (95% CI)	Probation only (n=2,855) % (95% CI)	No parole/probation (n=166,938) % (95% CI)
Gender[b,c,d]			
Male	77.8 (74.6–80.7)	66.5 (64.0–68.8)	47.8 (47.5–48.2)
Female	22.2 (19.3–25.4)	33.5 (31.2–36.0)	52.2 (51.8–52.5)
Age (years)[b,c,d]			
18–25	18.4 (16.4–20.5)	28.4 (26.4–30.4)	13.8 (13.6–14.0)
26–34	26.1 (23.1–29.3)	27.1 (24.8–29.5)	15.7 (15.5–16.0)
35–49	33.2 (29.7–37.0)	27.1 (24.9–29.3)	24.7 (24.4–24.9)
50–64	19.7 (15.5–24.6)	14.9 (12.4–17.9)	25.5 (25.2–25.9)
65+	2.6 (1.7–4.1)	2.6 (1.7–4.0)	20.3 (19.9–20.7)
Race/ethnicity[c,d]			
NH White	53.2 (49.3–57.1)	54.6 (52.0–57.2)	64.3 (63.9–64.8)
NH Black	19.8 (17.3–22.7)	18.2 (16.3–20.3)	11.7 (11.4–24.8)
Hispanic	20.8 (17.8–24.1)	19.9 (17.6–22.4)	15.8 (15.5–16.2)
Employment status[c,d]			
Full time	46.2 (42.7–49.8)	47.7 (44.9–50.6)	49.5 (49.1–49.8)
Part time	10.9 (8.6–13.8)	11.5 (10.0–13.3)	13.1 (12.9–13.4)
Unemployed	13.1 (11.1–15.8)	12.5 (10.7–14.6)	4.3 (4.1–4.4)
Other[e]	29.6 (26.2–33.3)	28.2 (25.6–30.9)	33.2 (32.8–33.5)
Injection drug use, lifetime[b,c,d]	23.1 (19.9–26.7)	11.6 (10.2–13.2)	1.6 (1.5–1.7)
Injected heroin, lifetime[b,c,d]	14.6 (11.8–17.8)	6.5 (5.4–7.8)	0.8 (0.8–0.9)
Injected cocaine, lifetime[b,c,d]	15.1 (11.9–19.0)	5.9 (4.8–7.1)	0.8 (0.7–0.9)
Injected methamphetamine, lifetime[b,c,d]	16.5 (13.4–20.1)	7.3 (6.2–8.6)	0.7 (0.6–0.7)
Injection drug use, past 30 days[b,c,d]	4.5 (2.9–6.9)	1.9 (1.3–2.7)	0.1 (0.1–0.1)
Injection drug use, past year but not in past 30 days[b,c,d]	4.4 (2.7–7.1)	1.6 (1.2–2.0)	0.1 (0.1–0.1)
Injection drug use, lifetime but not in past year[b,c,d]	14.3 (11.7–17.4)	8.2 (6.9–9.6)	1.3 (1.2–1.4)
Unsafe injection practices, last injection[b,c,d,f]	14.1 (11.2–17.6)	6.5 (5.5–7.7)	0.7 (0.6–0.7)
Not currently insured[b,c,d]	29.3 (25.8–33.1)	21.7 (19.6–24.0)	9.6 (9.3–9.8)
Drug treatment, past year[b,c,d]	19.4 (16.7–22.4)	11.2 (9.8–12.8)	0.6 (0.6–0.7)
Specialty drug treatment, past year[b,c,d,g]	14.4 (11.9–17.3)	7.8 (6.6–9.2)	0.4 (0.4–0.5)
Visited a health professional in a doctor's office or clinic, past year[c,d]	66.0 (62.1–69.7)	69.7 (67.2–72.0)	82.1 (81.9–82.4)
Treated in an emergency room, past year[c,d]	40.7 (36.9–44.7)	39.7 (37.0–42.5)	25.9 (25.5–26.2)
Stayed in the hospital overnight or longer, past year[c]	13.5 (11.3–16.1)	10.8 (9.3–12.6)	10.1 (9.8–10.3)

Notes

[a] Adults on parole in the past year may have also been on probation in the past year.

[b] Significant difference between adults on parole and adults on probation only (Chi-square p-value < .05).

[c] Significant difference between adults on parole and adults not on parole/probation (Chi-square p-value < .05).

[d] Significant difference between adults on probation only and adults not on parole/probation (Chi-square p-value < .05).

[e] Including not in the work force.

[f] During last injection, reported at least one of the following: 1) reused own needle, 2) reused another person's needle, or 3) another person later reused their needle.

[g] Specialty treatment refers to treatment at a hospital (only as an inpatient), a drug rehabilitation facility (as an inpatient or outpatient), or a mental health center. Treatment received in emergency departments, private doctors' offices, prisons or jails, and self-help groups were considered nonspecialty treatment.

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