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RESEARCH ARTICLE

A Mixed-Methods Assessment of Hepatitis C Treatment Readiness in an Urban County Jail System

Shelley N. Facente, PhD, MPH,[1,2,*] Katie Burk, MPH,[1] David Leiva,[3] and A. Asa Clemenzi-Allen, MD, MAS[3,4]

Abstract

Incarcerated people are disproportionately impacted by the hepatitis C virus (HCV). The purpose of this needs assessment was to characterize the population of incarcerated people with anti-HCV antibodies in one county jail system and assess the readiness of medical staff and patients for scaling up jail-based treatment. Logistic regression was used to identify factors associated with new HCV diagnoses in a retrospective cohort of patients completing HCV antibody and viral load testing between 2016 and 2021. Semistructured interviews were also conducted with 31 incarcerated people and 6 jail health services staff and thematically analyzed to identify barriers to and facilitators of jail-based HCV treatment. Of 6,282 people completing HCV antibody testing between 2016 and 2021, 79 (1.3%) were incarcerated long enough with a confirmed, active HCV infection to be cured, but were not. Of the incarcerated interviewees, 36% (8 people) preferred jail-based treatment of HCV. Jail health services staff were universally ready and willing to provide treatment in jail, should the budget allow. Many incarcerated people can be successfully diagnosed and cured of HCV in jail, and both incarcerated people and those who provide their health care desire jail-based treatment.

Keywords: hepatitis C, HCV, incarceration, jail, corrections, HCV treatment

Introduction

Since 2013, untreated infections of the hepatitis C virus (HCV) were the number one cause of death in the United States (U.S.) from a nationally notifiable infectious disease (Ly et al., 2016) until SARS-CoV-2 in 2020, and rates of newly identified acute HCV infections have been increasing steadily since 2010 (Schillie et al., 2020). HCV is most commonly transmitted through injection drug use and disproportionately impacts justice-involved people; prior estimates of HCV antibody prevalence range between 12% and 35% in large U.S. city jails (Abe et al., 2019; Chan, Kaba et al., 2020; Qureshi et al., 2021).

Universal HCV testing and treatment programs comprise a cost-effective microelimination strategy in priority populations such as carceral settings (Tatar et al., 2020), and in recent years, a number of lawsuits have compelled some state-run prisons to offer HCV treatment to incarcerated people (Daniels & Studdert, 2020). Yet despite evidence from pilot programs and state initiatives that have increased access to HCV treatment for carceral populations (Chan, Schwartz et al., 2020; Gee, 2019), the practice of HCV screening and treatment in jail settings remains relatively rare (Maner et al., 2022).

One major reason for this is that incarcerated people lose their public benefits upon incarceration, leaving the local jurisdiction to pay for costly HCV medications administered within their jail system (Centers for Medicare & Medicaid Services, 2024). Additional logistical challenges also exist, including the often brief duration of stays in jails. In San Francisco during this period of study, the median jail stay was only 2.0 days (Clemenzi-Allen, 2023).

To provide an epidemiological profile of HCV diagnoses in one county jail setting and to explore the feasibility

[1]*Facente Consulting, Richmond, California, USA.*
[2]*Division of Community Health Sciences, University of California, Berkeley, Berkeley, California, USA.*
[3]*Jail Health Services, San Francisco Department of Public Health, San Francisco, California, USA.*
[4]*Division of HIV, Infectious Disease and Global Medicine, University of California, San Francisco, California, USA.*

*Address correspondence to: *Shelley N. Facente, PhD, MPH, School of Public Health, University of California, Berkeley, 2121 Berkeley Way # 5302, Berkeley, CA 94720, USA,* Email: sfacente@berkeley.edu

of HCV treatment scale-up in a county jail system, we conducted a mixed-methods evaluation to characterize HCV testing and results, assess readiness to scale up HCV treatment, and identify best practices for jail-based treatment and/or linkage to community-based treatment following release.

Method

Setting

Jail Health Services (JHS) provides comprehensive health care to adult patients incarcerated in the San Francisco County jail system, as an ambulatory care setting within the San Francisco Department of Public Health. Through JHS, a dedicated team of prevention counselors and phlebotomists performs fingerstick point-of-care testing for HCV in all patients who agree to testing at the time of jail intake, or through outreach to patients in their housing units, which occurs at weekly intervals after intake. Patients identified as having a prior reactive HCV antibody test result are offered confirmatory RNA testing to facilitate linkage to treatment. Confirmatory testing for HCV RNA (i.e., viral load) is performed within 48 hours of any reactive HCV point-of-care antibody screening result.

HCV treatment is available in limited ways, with funding for a specific number of treatment starts per year, typically reserved for people sentenced for long periods and not expected to be released before the course of treatment can be completed. Those not treated in jail are provided with printed lists of local community HCV treatment sites and are invited to drop in to the staff office to see an HCV navigator, who provides a warm handoff to community-based treatment.

Retrospective Cohort

We abstracted patient-level data from the JHS electronic medical records for all people incarcerated in the San Francisco County Jail between January 2016 and September 2021. Abstracted outcomes of interest included ICD-9 diagnostic codes for HCV, point-of-care HCV antibody screening results, serum HCV antibody testing, and confirmatory HCV RNA tests. Covariates of interest were age, sex, race/ethnicity, housing status at the time of arrest, preferred substances, and dates of incarceration.

Statistical Analysis

We tabulated descriptive statistics for sociodemographic information and conducted chi-square tests to assess demographic differences among people incarcerated, tested for HCV antibodies, and having a reactive HCV antibody test. We then used logistic regression to identify factors associated with having a reactive HCV antibody result, controlling for sex, race/ethnicity, age, housing status, and preferred substances as independent variables. Unlike with the descriptive statistics, this regression analysis was only run on the subset of tests run in the clinical laboratory, excluding point-of-care rapid HCV antibody tests due to the difficulty of cleanly merging the two datasets required. All analyses were conducted using R statistical software version 4.0.5 (R Core Team, 2018) and used a significance level of $\alpha = .05$.

Qualitative Recruitment

We conducted interviews with a convenience sample of 31 people incarcerated in this county jail during April 11–15, 2022, with additional interviews conducted on June 27, July 5, and July 25, 2022. Interviewees met one of the following criteria: (1) diagnosed with HCV but not yet treated, (2) currently on treatment in jail, (3) previously living with HCV but successfully treated and now cured, or (4) at risk for HCV infection (with known opioid use as a proxy for risk), in that order of preference. Interviewers supplied names of potential interviewees to deputies on duty in each of the relevant housing pods, who then asked the individual whether they would like to participate in a voluntary health interview.

Participants were notified by the interviewer that no information would be shared with the Sheriff's Department and that failure to consent would have no negative impacts on them; researchers administered verbal consent to continue with the interview or returned to the main pod area. Interviews were conducted face-to-face in private rooms, with no recording devices except a laptop used for real-time notetaking by the interviewer, with content transcribed verbatim where possible. No identifying information was recorded about any of the incarcerated interviewees.

We also conducted interviews with six JHS staff. Staff were purposively invited for interviews based on general availability during our interview period, involvement in either the administration of HCV-related services or prescribing of HCV treatment, and a desire to have the widest variety of staff perspectives possible (i.e., clinical staff, managers, and program-focused staff). Staff verbally consented before the interview began.

Ethics

This assessment was found to be exempt from human subjects review by the Institutional Review Board at the University of California, San Francisco, as this was an internal programmatic evaluation for public health purposes and not human subjects research.

Qualitative Data Collection

We developed an interview guide for incarcerated participants (see Supplemental Material) that first collected

demographic information, including gender, race/ethnicity, age, educational level, incarceration history, human immunodeficiency virus (HIV) status, preincarceration drug use history, housing status at the time of arrest, and health insurance. Then we moved into a series of open-ended questions designed to explore the interviewee's experience with health care, behavioral health services, HCV testing and treatment, support systems, and general perspectives on barriers and facilitators for HCV treatment for people currently or recently incarcerated.

The guide was developed iteratively by study staff using a combination of two validated tools to assess HCV knowledge (Norton et al., 2014; Towe et al., 2019), along with feedback from JHS staff and the community research workgroup of the local HCV elimination initiative. Two questions asked interviewees to select, from a list, a location or intervention they thought was best and explain the reasoning behind their choice. After the first day of interviews, we brought laminated pages that provided the lists in writing to aid comprehension and recall during the interview.

Staff interviews were intended to be brief (less than 30 minutes), and the interview guide consisted of four questions designed to elicit information about what staff thought was going well regarding HCV treatment in the jail, how they would maximize JHS effectiveness with HCV, and what they thought were the best ways to determine who should be treated for HCV in jail rather than being linked to treatment in a community setting.

Qualitative Analysis

Once interviews were complete, the interview team discussed themes and drafted a preliminary codebook for the open-ended questions from both sets of interviews. Each interviewer initially coded the same three interviews, then met to compare internal consistency between coding and refine the codebook or coding strategies as needed. The initial interviews were recoded as appropriate, then the remaining interviews were coded by a single team member using the final shared codebook. Coded transcripts were then analyzed thematically using immersion and crystallization techniques (Borkan, 2022). Unfortunately, only 22 of the 31 interviews had open-ended data that could not be coded and analyzed due to unexpected data loss. Answers to closed-ended questions were entered for descriptive analysis for all 31 interviewees.

Results

Quantitative Findings

Between 2016 and 2021, a total of 39,434 people were incarcerated in the San Francisco County jails, and 9,765 HCV antibody tests were conducted among 6,282 people (15.9% of those incarcerated). Of those, 39% (15,187) were incarcerated multiple times during the review period (mean number of incarcerations = 2.5, with a range of 1–54). If requested during a subsequent incarceration, an individual was retested for HCV.

Table 1 provides the breakdown of sociodemographic factors by incarcerated people overall and those who completed HCV antibody testing. No statistically significant differences were seen between any demographic categories of people incarcerated and those tested for anti-HCV antibodies, nor for those incarcerated and those having a reactive result. Table 2 highlights the demographic breakdown of incarcerations, the total number of HCV antibody tests, and the total number of reactive results, with each category inclusive of duplicate people.

During the observation period, 6,282 unique people were tested for anti-HCV antibodies, and 9.4% ($n = 591$) had a reactive result (Fig. 1). Of those, 70% ($n = 415$) had a confirmatory viral load test run to determine whether they had active HCV infection, and of those, 77.8% ($n = 323$) had detectable HCV RNA. For those with confirmed infection, 28 people (8.7%) were treated for HCV while in this jail system; however, an additional 87 people had their "last known HCV status" in the electronic medical record as "cleared," indicating that some portion of those not treated in jail may have spontaneously cleared the virus or been treated elsewhere in the community after initial diagnosis but before rearrest.

In total, between January 2016 and September 2021, 79 of the 323 people confirmed to be living with HCV while incarcerated stayed in jail long enough to be cured before release (at least 8 weeks). Of those 79, 67 people had one window of 60 or more days of incarceration after their HCV diagnosis date; however, 7 people had two such windows, 3 people had three such windows, and 2 people had four such windows during the time they were incarcerated when they could have been cured.

Substantially higher percentages of White (23.0%) and American Indian (25.0%) people had reactive results when tested, compared with other races/ethnicities (ranging from 3.8% to 7.4%; Table 1); however, the absolute numbers of American Indians incarcerated and tested for anti-HCV antibodies were very small. Reactive results were more common in older people (3.4% reactivity for people age 24 and under, compared with 21.8% for people ages 55–64 and 24.5% for people age 65 and older). Though men were incarcerated in much larger numbers than women (31,283 incarcerated men compared with only 8,143 women), both sexes had equivalent HCV antibody prevalence (9.4% of men who received HCV antibody tests had reactive results, compared with 9.5% of women).

While transgender people are tested in the jails, gender (including cisgender and transgender) was not well captured in the medical record during this period, and

Table 1. Sociodemographic Characteristics of People Incarcerated Versus People With HCV Antibody Testing

	Incarcerated	*Tested for HCV antibodies*			*Reactive HCV antibody test*		
	n	n	%	X^2 p-*value compared with incarcerated*	n	%	X^2 p-*value compared with incarcerated*
Total	39,434	6,282	15.9	—	591	9.4	—
Age							
24 years and under	8,010	1,514	18.9	.224	52	3.4	.224
25–34 years	13,275	2,233	16.8		197	8.8	
35–44 years	8,634	1,343	15.6		149	11.1	
45–54 years	5,702	799	14.0		106	13.3	
55–64 years	3,014	340	11.3		74	21.8	
More than 65 years	798	53	6.6		13	24.5	
Unknown	1	0	0.0		0	—	
Sex							
Male	31,283	5,298	16.9	.199	498	9.4	.223
Female	8,143	983	12.1		93	9.5	
Unknown[a]	8	1	12.5		0	0.0	
Race[b]							
White	11,657	1,455	12.5	.229	335	23.0	.229
Black	12,563	2,778	22.1		157	5.7	
Latine	9,359	1,399	14.9		61	4.4	
Asian or Pacific Islander	3,360	419	12.5		16	3.8	
American Indian or Alaska Native	145	28	19.3		7	25.0	
Other/unknown	2,350	203	8.6		15	7.4	
Housing status at time of arrest							
Homeless	8,458	2,806	33.2	.157	389	13.9	.157
Not homeless	30,976	3,476	11.2		202	5.8	
Duration of incarceration							
Less than 1 week	35,568	4,959	13.9	.224	473	9.5	.242
1–4 weeks	1,839	489	26.6		48	9.8	
2–3 months	723	241	33.3		29	12.0	
4–6 months	395	145	36.7		16	11.0	
7–12 months	247	100	40.5		6	6.0	
More than 1 year	517	263	50.9		16	6.1	
Unknown	145	85	58.6		3	3.5	

[a]Unknown sex may include both people with missing data and those who are transgender; however, the male and female sex categories may also include transgender people, who were not systematically tracked by the jail system during this time period.
[b]Race categories are as reported in the jail electronic medical record system. All categories were single-choice; as such, multiracial people may have been included in any of the single categories that applied to them or may have been classified as "Other" during intake.
HCV = hepatitis C virus.

absolute testing numbers among transgender people in the dataset were very small. Additionally, the HCV antibody prevalence for tests conducted among people unhoused at the time of arrest was over twice that of people who were not unhoused (13.9% compared with 5.8%).

In the multivariate logistic regression, there were no statistically significant differences in HCV antibody status by sex (Table 3). However, Black and Latine people had less than one-quarter the odds of testing positive for HCV antibodies (odds ratio [OR]: 0.18, 95% confidence interval [CI]: 0.14–0.22 for Black; OR: 0.21, 95% CI: 0.15–0.28 for Latine) compared with White people. Those aged 24 or younger were significantly less likely than people ages 35–44 to have HCV antibodies when tested (OR: 2.58, 95% CI: 1.18–3.73, compared with those less than 25 years old as the reference group), and those older than 44 years of age were significantly more likely to have HCV antibodies—notably, those age 55 and older had more than 11 times the odds of having HCV antibodies than people age 24 and under (OR: 11.49, 95% CI: 7.64–17.47; with an OR of 4.03, 95% CI: 2.76–5.96 for people ages 45–54).

People who were homeless at the time of their arrest had 1.61 (95% CI: 1.30–1.99) times greater odds of HCV antibodies if tested than those who were housed at arrest, and those who used heroin alone as their preferred substance had 4.90 (95% CI: 3.78–6.36) times

Table 2. Number of HCV Antibody Tests and Positive Results, With Sociodemographic Characteristics

	Incarcerated		*Total completed HCV antibody tests*[a]		*Total reactive HCV antibody tests*	
	n	*Column %*	n	*Column %*	n	*Column %*
Total	39,434	100	9,765	100	736	100
Age						
24 years or less	8,010	20.3	2,393	24.5	75	10.2
25–34 years	13,275	33.7	3,557	36.4	248	33.7
35–44 years	8,634	21.9	2,080	21.3	189	25.7
45–54 years	5,702	14.5	1,218	12.5	126	17.1
55–64 years	3,014	7.6	454	4.6	84	11.4
65 years or more	798	2.0	63	0.7	14	1.9
Unknown	1	0.0	0	0.0	0	—
Sex						
Male	31,283	79.3	8,282	84.8	622	84.5
Female	8,143	20.7	1,481	15.2	114	15.5
Unknown[b]	8	0.0	2	0.0	0	0.0
Race[c]						
White	11,657	29.6	2,080	21.3	412	56.0
Black	12,563	31.9	4,660	47.7	203	27.6
Latine	9,359	23.7	2,098	21.5	74	10.1
Asian or Pacific Islander	3,360	8.5	593	6.1	18	2.4
American Indian or Alaska Native	145	0.4	41	0.4	9	1.2
Other/unknown	2,350	5.9	293	3.0	20	2.7
Housing status at time of arrest						
Homeless	8,458	21.4	5,181	53.1	518	70.4
Not homeless	30,976	78.6	4,584	46.9	218	29.6
Duration of incarceration						
Less than 1 week	35,568	90.2	7,854	80.4	598	81.3
1–4 weeks	1,839	4.7	692	7.1	59	8.0
2–3 months	723	1.8	319	3.3	31	4.2
4–6 months	395	1.0	164	1.7	16	2.2
7–12 months	247	0.6	128	1.3	6	0.8
More than 1 year	517	1.3	441	4.5	23	3.1
Unknown	145	0.4	167	1.7	3	0.4

[a]In this table tests are counted, not individuals tested. There may be individuals in each category who were tested multiple times.
[b]Unknown sex may include both people with missing data and those who are transgender; however, the male and female sex categories may also include transgender people, who were not systematically tracked by the jail system during this time period.
[c]Race categories are as reported in the jail electronic medical record system. All categories were single-choice; as such, multiracial people may have been included in any of the single categories that applied to them or may have been classified as "Other" during intake.
HCV = hepatitis C virus.

greater odds of reactive results than those who had no preferred substances indicated, and more than twice the odds of those who used methamphetamine alone (OR: 1.74, 95% CI: 1.35–2.25). All ORs were highly statistically significant for factors other than sex.

Qualitative Interviewee Demographics

Slightly more than half of the 31 incarcerated interviewees were Black, Indigenous, or other people of color, with 48% (n = 15) being White, 19% (n = 6) being Black/African American, and 13% (n = 4) being Latine. The remaining six were Asian or Pacific Islander (n = 2) or identified as multiracial (n = 4). Of the 31 interviewees, 27 (87%) were cisgender men, with three cisgender women and one trans woman. Twenty people (65%) were homeless at the time of their arrest; of the remaining 11, nine had been homeless at some time in the past, and two had never been homeless.

All interviewees had previously used drugs, with 27 (87%) reporting a history of injection drug use. Ninety-seven percent (n = 30) had previously been incarcerated. Almost half (42%) had been incarcerated for 1 to 3 weeks at the time of the interview, with another 19% incarcerated for 1 to 2 months, and 36% incarcerated for longer than 3 months.

Among the 31 incarcerated interviewees, 11 (36%) had active HCV infection. One was being treated in jail. Nine (29%) had been cured of HCV infection through treatment, and three had no detectable HCV RNA after prior infection but did not report having been treated. Five (16%) had never been diagnosed with HCV, and

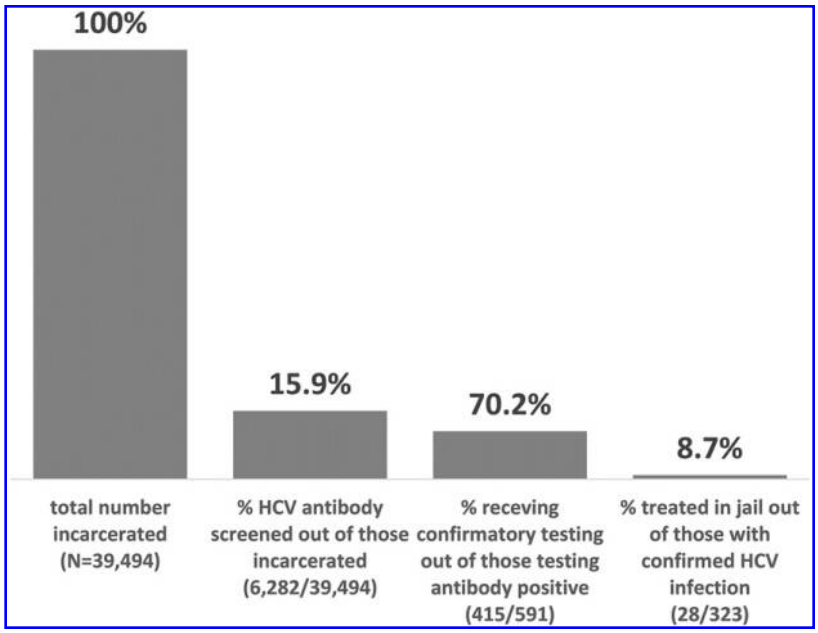

Fig. 1. Continuum of care for people currently or recently incarcerated in the county jail system from 2016 to 2021.

two were unsure of their HCV status. All interviewees had heard of HCV, and all reported having been tested for HCV at least once. Twenty-nine (94%) said they knew at least one person living with HCV other than themselves, and 23 (74%) knew at least one other person who had been treated for HCV.

Incarcerated interviewees reported tenuous connections to community medical care. Only 13 of the 22 interviewees whose qualitative data were analyzed (42%) reported having a regular medical provider outside of the jail system. However, 20 of 22 (91%) had received treatment for substance use disorder. Of the 77% (17 of 22) who reported past or present HCV infection, 15 (68%) had been offered treatment, and 10 (45%) had started treatment.

Preferences for HCV Treatment

Eight of the 22 interviewees (36%) identified jail as the best place to be treated for HCV, making that the most popular option. Some interviewees qualified their responses by saying jail-based treatment was preferable only if they knew they would be incarcerated long enough to complete it. One interviewee explained:

> "If someone is serving 8 weeks to 90 days they should be offered [HCV treatment] right away and they should be given the opportunity to take it. And anyone else not staying that long should be given the opportunity, and if they don't want to start it here there should be somewhere outside where they can start it."

Interviewees identified preferences for community-based treatment primarily based on which services they already utilized when not incarcerated, highlighting the importance of convenience and "one-stop shops" for multiple health-related needs.

Interviewees reported that conditions created by homelessness and chronic substance use disorders made it challenging to follow through with an 8-week treatment course in the community. When asked if they had ever been treated for HCV, one individual explained their experience with this cycle, saying:

> "The closest I got to [being treated for HCV] was a clinic outside of here. They gave me the pills. I had the pills. I didn't have a backpack. I was carrying my sleeping bag and I had the pills in it. I fell asleep and someone stole my sleeping bag and the pills got stolen from me. That was the closest I had ever gotten to any kind of cure."

Interviewees almost universally indicated that access to temporary or permanent housing would be the most helpful intervention to complete HCV treatment. As one explained, "Housing is really all that matters to being able to do treatment on the outside."

JHS Staff Perspectives on HCV Treatment

Despite advances, JHS staff reported having made in optimizing care along all points in the HCV care cascade, many prescribers expressed frustration about not having access to sufficient HCV medication to address need due to lack of funding. One explained:

Table 3. Associations Between HCV Antibody Status and Sex, Race, Age, Housing Status, Substance Use

Category	*Estimate (95% CI)*	p-*Value*
Sex		
Male	0.95 (0.74, 1.24)	.7178
Female	*Ref*	*Ref*
Race		
White	*Ref*	*Ref*
Black	**0.18 (0.14, 0.22)**	**<.0001**
Latine	**0.21 (0.15, 0.28)**	**<.0001**
Other/unknown	**0.25 (0.17, 0.36)**	**<.0001**
Age		
24 years or less	*Ref*	*Ref*
25–34 years	**1.94 (1.39, 2.77)**	**.0002**
35–44 years	**2.58 (1.18, 3.73)**	**<.0001**
45–54 years	**4.03 (2.76, 5.96)**	**<.0001**
55 years or more	**11.49 (7.64, 17.47)**	**<.0001**
Housing status		
Homeless at arrest	**1.61 (1.30, 1.99)**	**<.0001**
Housed at arrest	*Ref*	*Ref*
Preferred substances		
Both heroin and methamphetamine	**3.20 (2.21, 4.60)**	**<.0001**
Heroin only	**4.90 (3.78, 6.36)**	**<.0001**
Methamphetamine only	**1.74 (1.35, 2.25)**	**<.0001**
Neither substance indicated as preferred	*Ref*	*Ref*

Bolded text indicates statistical significance as per the prespecified alpha of .05.

CI = confidence interval; HCV = hepatitis C virus; Ref = reference group.

> "Treatment is not going great. We have the opportunity to do it, we just don't have the meds. Definitely with everyone here we can treat HCV. It's so easy to do with the medications, if we had more of the meds we could definitely treat the guys quicker."

One went further, stating that concerns about lack of adherence upon release in the community were disingenuous, given the county's investment in HIV treatment:

> "Everybody wants to help the jail, but when it comes down to really helping the jail, nobody wants to help the jail. We could just pay for Epclusa. You can have all the linkages you want, but unless you're going to hand-hold somebody, jail is a very good place to treat. But there's all this virtue signaling, and then no one really wants to pay for the treatment. We just need to take the risk that someone may not finish treatment. We can treat people, and we do this all the time with HIV meds."

JHS staff also discussed the importance of considering length of stay in the jail when determining a treatment plan. One clinician administrator explained:

> "The absolute number one determinant is: how long is their stay in jail? If they're here for 2 months in jail we can make sure that we have them for their whole course of treatment. If they're going to be here shorter we can do the work-ups and transfer them."

Although many staff and people experiencing incarceration agreed that treatment should be prioritized for those who would be incarcerated long enough to complete a treatment course (8 weeks), there is often uncertainty about release dates or last-minute changes that pose challenges to treatment planning. Others suggested it was sufficient to treat everyone in jail long enough to complete *most* of their treatment cycle, even if not all. JHS staff also highlighted the importance of prioritizing the most unstable individuals because their chances of success in a community setting are diminished. A clinician explained:

> "Some of the folks who have severe mental illness or substance use, they'd be good to treat in custody because they have a chance to stabilize a little bit. Sometimes the more unorganized folks could be more successful if they're treated in jail. At least when they're incarcerated they might connect with medical providers more frequently."

Another clinician noted, "The jails work with a lot of people who don't get care anywhere else or are frequent emergency care users. Ultimately some people really only get medical care in jail."

Finally, while not all JHS staff members felt they could comment on whether in-jail treatment was explicitly preferred by incarcerated people, one prescriber noted emphatically that HCV treatment in jail is widely preferred:

> "The patients are interested in treatment, every time I bring it up. I think it's not just the providers wanting to treat, the patients are really interested. Especially when they hear it's just 2 months, and it's pretty easy, and we could just do it here while they're stuck with us."

Discussion

In this mixed-methods study, we found that 15.9% of people incarcerated in the San Francisco County jail system were tested for HCV antibodies, and of those tested, 9.4% were found to have a current or past history of HCV infection. This is a much lower antibody prevalence than has been found in Baltimore (Solomon et al., 2004). HCV antibody reactivity was significantly more common among Black and Latine people, people age 25 and older, those who were homeless at the time of arrest, and those who had a history of heroin and/or methamphetamine use. This is much lower than the 20.6% HCV antibody reactivity rate seen in the New York City jails in 2013–2014 (Akiyama et al., 2017), which may reflect missed detections in San Francisco jails due to more limited screening, and/or a truly reduced prevalence of infection in the incarcerated population thanks to the approval and use of highly effective direct-acting antivirals in 2014.

In our qualitative interviews, we found that incarcerated people expressed strong motivation to complete HCV treatment while in jail, but significant gaps remain in jail-based

treatment opportunities. Specifically, this evaluation identified that jail-based treatment is preferred for many people given that jail provides a temporarily stable environment that supports adherence to daily medication. Importantly, studies in both San Francisco (Yoshida-Cervantes et al., 2018) and New York City (Chan, Schwartz et al., 2020) have found high rates of sustained virologic response (a proxy for cure) among people who initiated treatment in jail.

Models of HIV, sexually transmitted infection, tuberculosis, and buprenorphine treatment are substantially more expansive in the jail setting (Matucci et al., 2023; Saberi et al., 2012; Spaulding et al., 2022; Sufrin et al., 2023), suggesting that costly medications for infectious diseases and substance use disorders can be successfully administered in this setting, should the political will exist to pay for them.

In alignment with our findings from qualitative interviews with JHS staff, the cost of HCV treatment is known to be the main barrier to its implementation within most jail settings in the U.S. While the evidence is clear that HCV treatment for people who inject drugs is cost-effective when assessing incremental cost per quality-adjusted life year (Tatar et al., 2020), this does not mean that counties have funds available to pay for the treatment.

Though some states have requested waivers under certain conditions, the Medicaid Inmate Exclusion Policy prohibits federal Medicaid reimbursement for health care services delivered to any incarcerated person in the U.S., and similar insurance suspensions are in place for private health insurance, including that obtained through the Affordable Care Act. This means that the county that runs the jail system is responsible for picking up the cost of all health care. Jails generally have much more limited funding than prisons (which are typically state or privately run), and prior research has shown that providing HCV treatment in jails could overwhelm the pharmacy budget at the expense of addressing other health conditions, unless dramatic reductions in treatment costs could be negotiated (Spaulding et al., 2019).

The reality is that if not treated in jail, many people cycling in and out of the jail system are likely to remain untreated; our analysis indicated that 56% of people known to have HCV in this jail system remained untreated for their chronic infection, despite the long-standing existence of these services in the community. This suggests that existing community supports may be insufficient for a subset of the jail population living with HCV and caught in a cycle of substance use, homelessness, and recidivism. This is important, as our evaluation found that people who used heroin or methamphetamine and people who were homeless at the time of arrest were significantly more likely to have HCV antibodies when tested.

Research has conclusively demonstrated that people who struggle with disordered substance use and homelessness can be treated much more successfully when treatment is integrated at a place where they are already engaged, rather than relying on high-touch navigation to clinical services elsewhere (Eckhardt et al., 2022). Yet to successfully make these connections for people leaving jail, referral to existing community services must be bolstered by communication within groups of providers, advertising services to people in jail, and strengthening linkage processes.

Even with these supports, many studies in other cities have shown that despite strategies to improve connection to HCV care after release from a correctional setting, substantial barriers remain (Kamat et al., 2023; Kronfli et al., 2024; Wiersema et al., 2024). Akiyama and colleagues (2019) found in a clinical trial that only 20% of people who returned to the community after their index incarceration were able to successfully initiate HCV treatment.

Notably, while many HCV treatment adherence services have existed in the surrounding city of San Francisco for many years and are designed specifically for people who use drugs and/or are experiencing homelessness, many jail-based interviewees were enthusiastic about the prospect of accessing these types of community-based supports as if they were new ideas that might be started up, demonstrating gaps between availability, awareness, and successful access.

While we were unable to find any estimates of the reproductive number of HCV infections among people in county jails, the best proxy may be that of people who inject drugs in high-prevalence communities, as that group makes up the majority of people living with HCV in this county jail system. Using a reproductive number of 2.08 people (Scott et al., 2015), we can roughly estimate that having successfully treated in jail the 79 people during the observation period who were incarcerated long enough to complete an HCV treatment regimen after their active infection was confirmed would likely have averted 164 new infections.

Our assessment does have several limitations. First, as this was a secondary data analysis using preexisting medical record data, we were limited by the variables present in the data. Covariates such as gender, sexual orientation, tattooing, sexually transmitted infection history, and injection history (rather than just preferred substance) are all characteristics that would have been interesting to include, had they been available. Second, we did not include clinical data on staging of liver disease in this analysis, and thus cannot comment on whether that is associated with prioritized treatment access for this population.

Third, this was not designed as a comprehensive organizational readiness assessment for HCV treatment in the San Francisco County jails; rather, it was an initial exploration of the feasibility and acceptability of such treatment among incarcerated people and their health care providers. Further work using a formal organizational readiness framework may improve the county's ability to overhaul their approach to jail-based HCV treatment, should they wish to take this on.

Conclusion

If U.S. cities are committed to aligning with the first national HCV elimination strategy (National Academies of Sciences, Engineering, and Medicine, 2017)—something multiple researchers have estimated is possible (Fraser et al., 2019; Grebely et al., 2017; Mirzazadeh et al., 2022)—we must be looking for ways to microeliminate HCV in high-prevalence settings, and strategically invest in strategies for the hardest-to-serve populations to achieve cure and prevent further spread.

The findings of this assessment contribute to the first published analysis to characterize factors associated with HCV reactivity in a U.S. jail system since the advent of highly effective direct-acting antivirals in 2014 and add to the limited literature about barriers to and facilitators of successful jail-based HCV treatment, should funding be made available by counties to support treatment in that setting. The findings underscore the need to prioritize HCV treatment for all people incarcerated in county jails in high-prevalence areas, in the same way sexually transmitted infection and HIV treatment are already prioritized in most jail systems. This urban area's work to liberalize community-based HCV treatment in settings such as syringe services programs, methadone programs, and primary care has already delivered treatment to hundreds of vulnerable city residents living with HCV. Those remaining to be treated have nonexistent or extremely tenuous connections to community care; competing needs around securing basic necessities often override their ability to make and keep appointments without significant support in a community setting. In their interviews for this assessment, JHS staff and incarcerated people alike emphasized the importance of jail-based treatment options and noted that there is existing infrastructure to provide treatment. The most significant barrier to scaling up the program, they point out, is the lack of access to the life-saving medication.

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Authors' Contributions

S.N.F.: Conceptualization, methodology, formal analysis, investigation, writing—original draft; K.B.: Conceptualization, methodology, formal analysis, investigation, writing—review and editing, funding acquisition; D.L.: Writing—review and editing, project administration; A.A.C.-A.: Writing—review and editing, supervision.

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