

Parallel and contrasting HIV epidemics among people who inject drugs in Oakland and San Francisco: implications for getting to zero infections by 2030

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Abstract

The neighboring California counties of San Francisco and Alameda (including Oakland) are two of the 57 jurisdictions prioritized by the national End the HIV Epidemic initiative. We surveyed people who inject drugs (PWID) to characterize county-level epidemiological differences relevant to HIV elimination programs. While HIV prevalence was comparable (5% in Oakland, 7% in San Francisco), demographics, drug use behaviors, and access to HIV prevention differed markedly. PWID in Oakland were less likely to test for HIV, have heard of pre-exposure prophylaxis (PrEP), be aware that PrEP can prevent HIV transmission through sharing injection equipment, and discuss PrEP with a healthcare provider than PWID in San Francisco. PWID in San Francisco most often injected methamphetamine; PWID in Oakland injected heroin most often. Given proximity, mobility of PWID, and cross-county use of services, ending the HIV epidemic cannot be achieved without inter-urban coordination of efforts while targeting differing local program gaps.

Introduction

The neighboring counties of Alameda and San Francisco, California, are two of the 57 priority health jurisdictions of the US national Ending the HIV Epidemic (EHE) initiative.¹ The two are part of the nine San Francisco Bay Area counties that comprise a continuous metropolitan core ringing the bay with persons working, playing, and moving residence throughout. San Francisco witnessed a 69% drop in reported new HIV infections from 2012 to 2020, but this trend has since stalled.² Alameda County, with Oakland as its major city, saw a similar but smaller decrease in new HIV infections.³ Both counties had the most pronounced reductions among men who have sex with men (MSM). Progress in eliminating HIV infections among people who inject drugs (PWID) has moved slower. Meanwhile, there is high mobility of people living with HIV between the two counties. For example, 10% of persons diagnosed with HIV in San Francisco had moved to Alameda as of 2025 (personal communication, Sharon Pipkin, Supervising Epidemiologist for HIV Surveillance, 12 May 2026). To end the HIV epidemic, effective scale-up of EHE prevention programs for PWID will require close coordination of programs between priority jurisdictions and better understanding of epidemiological differences between nearby epicenters. The objective of this report is to compare HIV-related risk and preventive behaviors of PWID using data from our joint county surveillance study within our bordering EHE priority areas.

Methods

Baseline measures were collected for the Brief Longitudinal Incidence Sentinel Surveillance (BLISS) study of PWID in Alameda and San Francisco counties from April 2024 to March 2025. Because recruitment in Alameda County was entirely from the city of Oakland, we hereafter refer to participants from Alameda County as from Oakland. San Francisco County only includes the city of San Francisco. Eligibility criteria were 1) aged 18 years or older, 2) injected non-prescribed drugs in the past three months, 3) residing in either county, and 4) speaking English or Spanish.⁴ Starfish Sampling, a

hybridization of venue-based outreach and peer-referral,⁵ was used to recruit 300 PWID in Oakland and 300 in San Francisco (total N = 600). Participants received \$50 to complete a survey and undergo rapid HIV testing with a \$10 incentive for each eligible peer referred to the study.

The survey was administered face-to-face with staff recording responses electronically. Demographic measures included age, race/ethnicity, sex assigned at birth, sexual orientation, education, income, living situation (e.g., own, rent, homeless), and incarceration in the past three months. Access to healthcare measures included having insurance, seeing a provider in the last three months, experiencing discrimination when seeking healthcare, avoiding seeking healthcare services due to anticipated discrimination, and substance-use program access (e.g., in treatment, seeking treatment). Participants were also asked about prior HIV diagnosis, whether they were on anti-retroviral treatment (ART), and if virally suppressed. HIV prevention-related questions included whether they had heard of pre-exposure prophylaxis (PrEP), were aware that PrEP can prevent sexual transmission of HIV and reduce injection-related transmission of HIV, discussed PrEP with a healthcare provider, and PrEP use in the past three months. Drug use measures included any substance used for non-medical purposes, which substance they injected most often, and substances most available in their community.

Chi-squared and Fisher's Exact tests assessed differences in demographics, access to healthcare, and HIV-related behaviors between PWID in Oakland and San Francisco using STATA 18.0. Statistical significance was defined as $\alpha < 0.05$.

The study was approved by the Institutional Review Board of the University of California, San Francisco (IRB#23-40130). Written informed consent was obtained from all participants.

Results

PWID in Oakland were more likely to be older (46% ≥ 50 years vs. 28%, $p < 0.001$), Black/African American (59% vs. 18%, $p < 0.001$), female (36% vs. 28%, $p = 0.036$), and heterosexual (89% vs. 77%, $p = 0.001$, Table I) compared to PWID in San Francisco. PWID in Oakland were more likely to experience homelessness (47% vs. 36%, $p < 0.001$) but less likely to have been incarcerated in the last three months (5% vs. 14%, $p < 0.001$).

Differences in access to healthcare included more PWID in San Francisco having insurance (93% vs. 89%, $p = 0.046$), receiving care (66% vs. 58%, $p = 0.044$), and being in a drug treatment program (19% vs. 7%, $p < 0.001$). PWID in San Francisco were more likely to report feeling discriminated against because of drug use when seeking health services (36% vs. 23%, $p = 0.001$).

Drug use differed in that heroin was the drug injected most often by PWID in Oakland (47% vs. 11%, $p < 0.001$) whereas methamphetamine was injected most often in San Francisco (46% vs. 23%, $p < 0.001$). Over half of PWID in San Francisco (54%) reported fentanyl as the drug most available compared to 24% in Oakland ($p < 0.001$). Nearly all PWID in both cities reported receiving harm reduction supplies in the past three months.

HIV prevalence was 5% among PWID in Oakland, statistically comparable to San Francisco (7%, $p = 0.737$). PWID living with HIV in Oakland were more likely to be aware of their infection (15/15, 100%) than PWID in San Francisco (14/20, 70%, $p = 0.020$) (Fig. 1). Somewhat fewer PWID in San Francisco were on ART (70% vs. 93% in Oakland, $p = 0.088$) or reported viral suppression (55% vs. 67%, $p = 0.486$).

Indicators of prevention access also differed by county (Table I). PWID in San Francisco were more likely to have tested for HIV (40% vs. 21% $p < 0.001$) and for STIs (33% vs. 25%, $p = 0.025$) compared to PWID in Oakland. PWID in San Francisco were more likely to have heard of PrEP (70% vs. 47%, $p < 0.001$), know that PrEP can prevent HIV transmission through condomless sex (52% vs. 30%, $p < 0.001$), and reduce the risk of acquiring HIV through sharing needles/syringes (36% vs. 23%, $p = 0.001$). PrEP use in the past three months was low but slightly higher in San Francisco than in Oakland (3% vs. 0.4%, $p = 0.019$).

Discussion

Our study measured HIV prevalence among PWID in two neighboring EHE priority jurisdictions in 2024/25.¹ While HIV prevalence is similar across the cities, we characterize epidemiologic, health, and prevention access differences that have implications for HIV elimination programs.

Notable differences between PWID in the two counties included PrEP knowledge and uptake. Previous research showed that PrEP use among PWID in San Francisco remained low despite successful scale-up among MSM and trans women.⁶ To our knowledge, this is the first assessment on PrEP uptake among PWID in Oakland. Most PWID in San Francisco had heard of PrEP and were aware that it can prevent sexual transmission of HIV, while in Oakland these figures were under half and under one-third, respectively. Greater overall awareness of PrEP among PWID in San Francisco may be due to widespread campaigns mostly focused on LGBTQ populations and the higher proportion of PWID in San Francisco who identify with sexual minority groups.⁶ The fact that majorities of PWID in both counties were unaware that PrEP can reduce HIV transmission through sharing injection equipment speaks to the need for specific messages to reach PWID. Such messages need to focus on people outside LGBTQ populations and provide data on the protective effect of PrEP for people who share injection equipment.⁷

Few PWID in either county discussed PrEP with a healthcare provider, highlighting the need to engage providers to identify risk and promote PrEP benefits to their patients who use drugs.⁸ Previous research found that Black/African American female PWID in San Francisco were the demographic least likely to have healthcare providers discuss PrEP with them.⁹ The current study demonstrates that this disparity is even wider in Oakland. Further compounding the disparity, PWID in Oakland had lower indicators of healthcare access.

Understanding differences in demographics, structural factors, and drug use patterns help target HIV prevention programs tailored for PWID in Oakland and San Francisco. For example, homelessness is higher among PWID in Oakland, while incarceration is higher in San Francisco. A particular challenge for

San Francisco is addressing the higher and rising use of methamphetamine and its association with increased sexual risk for HIV.^{10,11}

We recognize limitations of our study. First, the face-to-face interview and reliance on self-report may result in under-reporting of stigmatized behaviors. Second, the epidemiology of HIV in our counties may not reflect that of other health jurisdictions designated as EHE priorities. The Bay Area has had a vigorous response to the HIV epidemic since its appearance, including LGBTQ community engagement, rapid scale-up of PrEP, and early implementation of harm reduction programs for PWID.¹² The impact of these efforts may be seen in the fact that HIV prevalence among PWID in our region has not reached levels witnessed in other areas of the US.¹³ Third, data may not represent all PWID within our counties. To support our study's approximate representativeness in San Francisco, we note that the prevalence of HIV in the current study is similar to that reported in a separate study in 2024.¹⁰

Given proximity, mobility of PWID populations, and cross-county use of services, meaningful progress towards ending the HIV epidemic in the US cannot be achieved without inter-urban coordination that also targets local gaps in programs. Our data characterize and identify potential points for enhancing prevention interventions in our region.

Declarations

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Disclaimer

The authors declare they have no conflicts of interest. The views expressed are those of the authors and should not be construed to represent the positions of the Alameda and San Francisco County Departments of Public Health.

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Tables

Table I Demographic characteristics, access to health care, drug use practices, and HIV risk and prevention behaviors among people who inject drugs in Oakland and San Francisco, California, 2024-2025, N=600

Characteristics	Oakland N=300 (%)	San Francisco N=300 (%)	P-value
Age group in years			<0.001
18-29	6 (2)	13 (4)	
30-39	65 (22)	99 (33)	
40-49	91 (30)	103 (34)	
50-59	88 (29)	58 (19)	
60+	50 (17)	27 (9)	
Race/ethnicity			<0.001
White	80 (27)	151 (50)	
Black/African American	175 (59)	54 (18)	
Hispanic	15 (5)	17 (6)	
Multiracial	21 (7)	64 (21)	
Other	7 (2)	14 (5)	
Sex at birth			0.036
Male	192 (64)	216 (72)	
Female	108 (36)	84 (28)	
Sexual orientation			0.001
Heterosexual, straight	265 (89)	231 (77)	
Homosexual, gay, lesbian	7 (2)	9 (3)	
Bisexual	23 (8)	51 (17)	
Other	2 (1)	8 (3)	
Education			0.226
Less than high school	64 (22)	52 (17)	
High school graduate or GED	127 (43)	116 (39)	
Some college	83 (28)	102 (34)	
College graduate or higher	24 (8)	30 (10)	

Employment			0.174
Unemployed	168 (56)	179 (60)	
Employed	22 (7)	32 (11)	
Unable to work due to health reasons	91 (30)	70 (23)	
Other	18 (6)	19 (6)	
Monthly income			0.742
Less than \$1000	189 (63)	187 (62)	
\$1000-\$1999	79 (26)	76 (25)	
\$2000 or more	31 (10)	37 (12)	
Living situation			<0.001
Own or rent an apartment	62 (21)	30 (10)	
Single room occupancy (SRO)	18 (6)	80 (27)	
Homeless (e.g., car, street, shelter)	140 (47)	108 (36)	
Other (e.g., motel, couch surfing)	80 (27)	81 (27)	
Incarcerated, past 3 months	16 (5)	43 (14)	<0.001
Currently have health insurance	266 (89)	280 (93)	0.046
Received medical care in the past 3 months	174 (58)	198 (66)	0.044
Currently in a drug treatment program	22 (7)	57 (19)	<0.001
Sought a drug treatment program in the past 3 months, among those not enrolled (N=518)	40 (14)	40 (15)	0.547
Felt discriminated against when seeking healthcare services due to drug use, past 3 months			
No	147 (50)	122 (41)	0.001
Did not need healthcare services	82 (28)	69 (23)	
Yes	67 (23)	109 (36)	
Delayed or avoided seeking healthcare services due to discrimination towards drug users, past 3 months			
No			0.260
Did not need healthcare services	140 (47)	123 (41)	
Yes	54 (18)	54 (18)	

	103 (35)	122 (41)	
Drug injected most often in the past 3 months			<0.001
Heroin	141 (47)	32 (11)	
Methamphetamine	68 (23)	138 (46)	
Fentanyl	50 (17)	69 (23)	
New speedball (fentanyl + meth)	10 (3)	35 (12)	
Speedball (heroin + cocaine)	10 (3)	6 (2)	
Goofball (heroin + meth)	6 (2)	6 (2)	
Powder cocaine	4 (1)	6 (2)	
Crack cocaine	7 (2)	3 (1)	
Other	4 (1)	5 (2)	
Drugs used in the past 3 months (multiple responses and modes allowed)			
Heroin	81 (27)	73 (24)	0.455
Methamphetamine	169 (56)	243 (81)	<0.001
Fentanyl	100 (33)	202 (67)	<0.001
New speedball (fentanyl + meth)	6 (2)	49 (16)	<0.001
Speedball (heroin + cocaine)	12 (4)	5 (2)	0.085
Goofball (heroin + meth)	8 (3)	10 (3)	0.632
Powder cocaine	47 (16)	50 (17)	0.739
Crack cocaine	82 (27)	115 (38)	0.004
Drug most available in the community			<0.001
Heroin	56 (20)	5 (2)	
Methamphetamine	96 (34)	93 (32)	
Fentanyl	67 (24)	157 (54)	
New speedball (fentanyl + meth)	4 (1)	0	
Speedball (heroin + cocaine)	2 (1)	0	
Goofball (heroin + meth)	0	0	
Powder cocaine	6 (2)	0	
Crack cocaine	49 (18)	37 (13)	

Injected every day in past 3 months	173 (58)	150 (50)	0.054
Injected alone in past 3 months			0.716
Never	60 (20)	63 (21)	
Sometimes	62 (21)	66 (22)	
About half the time	33 (11)	34 (11)	
Most of the time	69 (23)	77 (26)	
Always	74 (25)	60 (20)	
Received harm reduction supplies in the past 3 months	295 (98)	296 (99)	0.737
Tested HIV positive	15 (5)	20 (7)	0.384
Had an HIV test in the past 3 months, among those not living with HIV (N=571)			<0.001
	59 (21)	115 (40)	
Had a sexually transmitted infection (STI) test in the past 3 months			0.025
	73 (25)	98 (33)	
Had heard of PrEP, among those not living with HIV (N=571)			<0.001
	135 (47)	200 (70)	
Aware PrEP can prevent HIV transmission through condomless sex, among those not living with HIV (N=571)			<0.001
	86 (30)	149 (52)	
Aware PrEP can prevent HIV transmission through sharing needles/syringes, among those not living with HIV (N=571)			0.001
	66 (23)	104 (36)	
Discussed PrEP with a healthcare provider in the past 3 months, among those not living with HIV (N=571)			0.172
	14 (5)	22 (8)	
PrEP use in the past 3 months, among those not living with HIV (N=571)			0.019
	1 (0.4)	8 (3)	

Figures

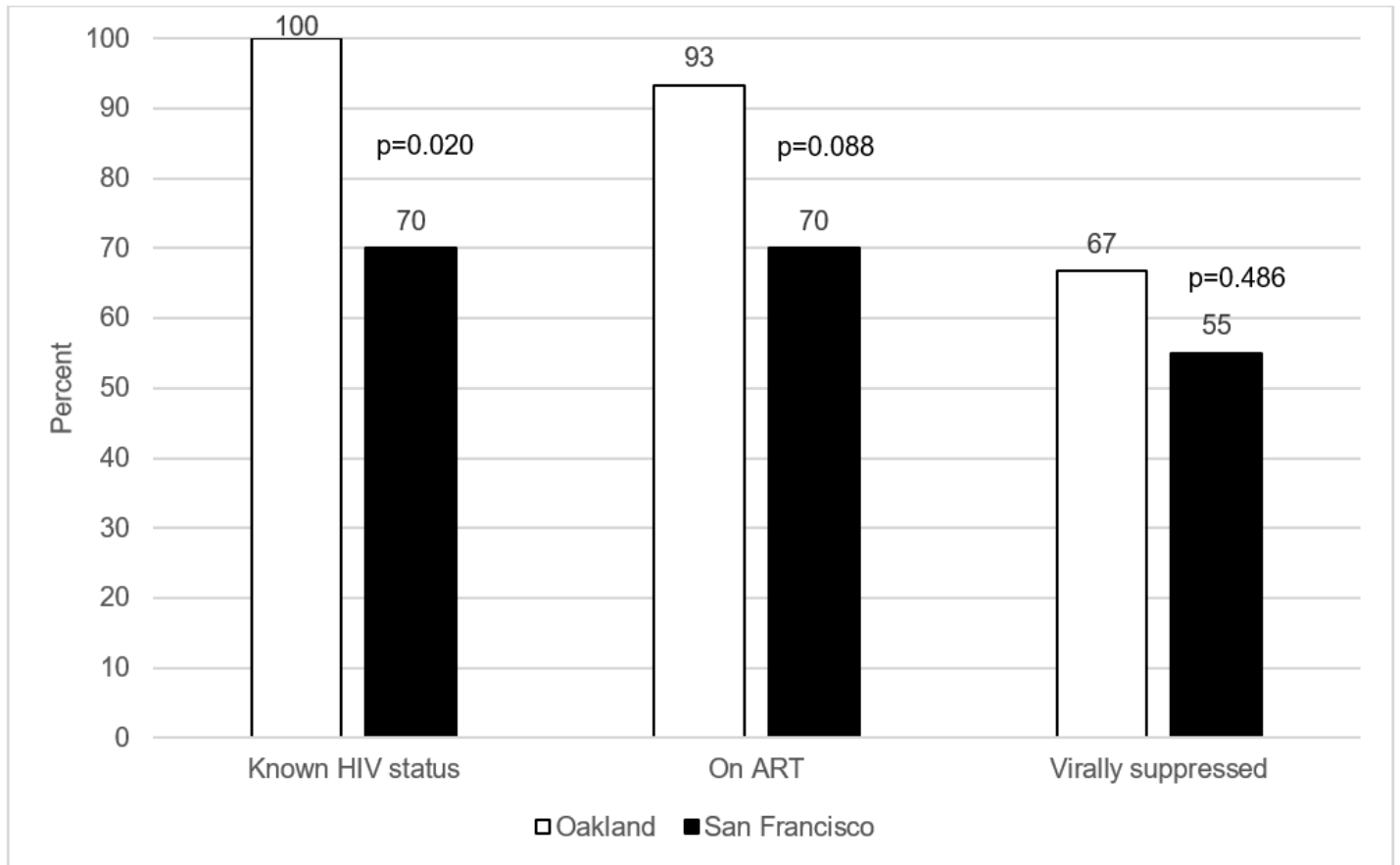


Figure 1

HIV care continuum among people who inject drugs and living with HIV, Oakland and San Francisco, California, 2024-2025 (N=35 participants living with HIV, percents are of total living with HIV in each city)