2018

SYRINGE EXCHANGE PROGRAM ANNUAL REPORT

HAWAIʻI HEALTH
& HARM REDUCTION CENTER

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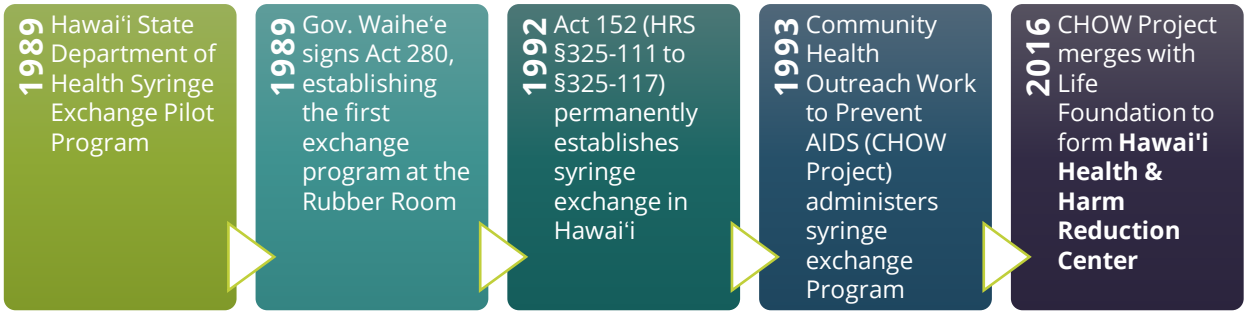
A BRIEF OVERVIEW OF SYRINGE EXCHANGE IN HAWAIʻI

The Hawaiʻi State Department of Health's (HDOH) started a pilot syringe exchange program in 1989 as part of its response to the growing Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome (HIV/AIDS) crisis in the state. The project goal was to reduce the acquisition and/or transmission of HIV among persons who inject drugs (PWID) through peer educators who were former PWID and were knowledgeable of PWID in the state.

Another pilot program was established in 1990 when former Hawaiʻi Governor John Waiheʻe signed Act 280 into law, which led to Hawaiʻi's first syringe exchange program (SEP). Located at the Rubber Room in Downtown Honolulu, the SEP was operated by members of the Life Foundation, the largest and oldest AIDS organization in the Pacific. After the two-year pilot period demonstrating safety and efficacy of the program, the state legislature passed Act 152 in 1992. Act 152, codified as Chapter 325, Part VII of Hawaiʻi Revised Statues (HRS §325-111 through §325-117), enabled HDOH to operate SEP to prevent transmission of HIV, hepatitis B (HBV), hepatitis C (HCV), and other blood-borne pathogens, and to refer PWID with appropriate health and social services. HRS §325-115 requires HDOH to appoint an oversight committee to monitor the progress and effectiveness of the SEP and to examine available data compiled by the program. HRS §325-116 requires the HDOH to report annually to the oversight committee, including the number and demographics of participants, the impact of the program on HIV infection, an assessment of the cost-effectiveness of the program, the strengths and weaknesses of the program, the advisability of its continuation, and ways to improve the SEP. This evaluation fulfills the syringe exchange program's obligations under these two statutes.



The legislature named Community Health Outreach Work to Prevent AIDS (CHOW Project) as the coordinating agency for the statewide SEP in 1993. The CHOW Project extended the SEP services beyond Oʻahu to the islands of Kauaʻi, Maui, and Hawaiʻi island in 1994. In 2018, the CHOW Project merged with Life Foundation continues to operate the SEP under its new organizational name, Hawaiʻi Health & Harm Reduction Center (HHHRC). Today, HHHRC operates five mobile vans which cover each of Hawaiʻi's four counties and provides

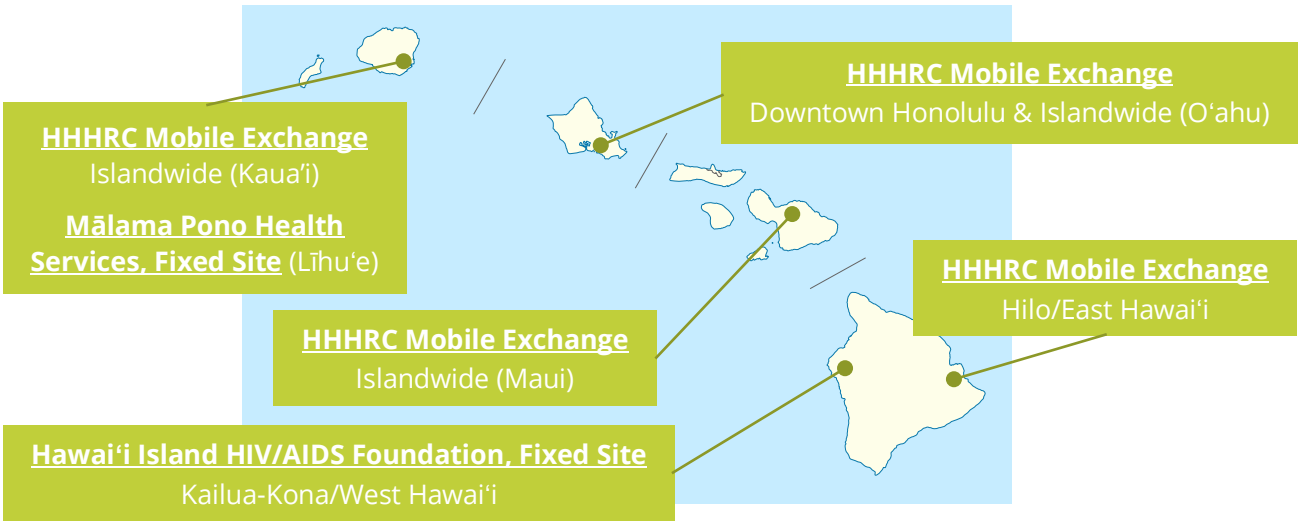
a variety of services beyond syringe exchange. Outreach workers establish contact and trust with PWID who access SEP to encourage safer injection and sexual behaviors. Outreach workers provide health education, HIV and HCV testing and counseling, linkages to housing navigation and other services, wound care, overdose prevention education (including naloxone training and distribution), and harm reduction supplies, such as condoms, hygiene kits, health education materials, and pipe covers, which are used to prevent cuts and burns from smoking substances with a glass pipe.

In 2018, HHHRC exchanged 1,177,421 syringes statewide, a 3229% increase since 1993 when it exchanged only 35,365 syringes. Currently, the Hawaiʻi statewide SEP is one of the larger programs in the United States and was the first program in the U.S. to be fully state-funded to offer coordinated services statewide. As of September 2019, there were 349 SEPs operating in in 40 states, the District of Columbia, and Puerto Rico.[1]

SEP OPERATIONS

Hawaiʻi's SEP began in a fixed location which provided the opportunity to offer comprehensive services to participants accessing the SEP. Currently, HHHRC operates its SEP through mobile sites and Syringe Exchange Appointments (SEA) where outreach workers meet participants at locations convenient for the participant. While this model provides flexibility, it limits the services that may be provided, such as HIV and HCV outreach, testing, and linkage activities, wound care, or other activities, although the SEP continues to find innovative ways to provide these services in the field. The downtown Honolulu mobile exchange has a regular schedule with the van parked in the same location five days a week, and a second van that visits other parts of the island each day of the week to see participants who cannot make it into downtown Honolulu. The Neighbor Islands have a mix of fixed sites where the vans are parked at a location regularly and SEA visits.

Figure 1. Map of syringe exchange program coverage and subcontractors



In 2016, the SEP began a collaborative relationship with the Hawaiʻi Island HIV/AIDS Foundation (HIHAF) in Kailua-Kona. HIHAF conducts syringe exchange out of their office on Palani Road. The HIHAF outreach workers do not exchange outside of their office, so the Hawaiian Ocean View Estates (HOVE) area continues to be served by SEP outreach workers from Hilo. In 2017, the SEP also partnered with Mālama Pono Health Services to provide additional syringe exchange services on Kauaʻi in order to provide more services to PWID who may not normally have contact with the SEP (see Figure 1).

INJECTION DRUG USE, RISK BEHAVIORS AND OVERDOSE IN HAWAIʻI

PREVALENCE OF INJECTION DRUG USE AND OTHER RISK BEHAVIORS AMONG YOUTH

Nationally in 2017, 1.5% of high school aged youth reported ever injecting illegal drugs, with more males students reporting having ever injected drugs than female students (2.0% versus 0.8%).[2] During the same time period, 2.8% of Hawaiʻi public high school students reported ever injecting drugs, again with higher proportions of male students (4.0%) reporting ever injecting compared to female students (1.2%). Black students (7.9%), other Pacific Islander students (5.3%), and Native Hawaiian students (3.5%) were most likely to have reported injecting between 2013-2017. Over time, the percentage of female students injecting has gone down from 2.7% in 2013. Hawaiʻi County high school students were most likely to report ever injecting drugs between 2013-2017 (3.7%), followed by Maui County (3.5%), Kauaʻi County (3.4%), and Honolulu County (2.6%).[3]

Lesbian, gay, and bisexual youth disproportionately report having ever injected an illegal drug (8.9%) compared to their heterosexual counterparts (1.8%).[4] Additionally, 12.2% of high school youth and 6.8% of middle school students in 2017 reported misusing prescription pain medication,[3] which has been associated with future injection drug use among younger people.[5-7] Significantly more transgender youth report ever having injected drugs compared to their cisgender (a person whose gender identity corresponds with their sex assigned at birth) counterparts (25% vs. 1%, respectively).[8] These statistics show that youth in Hawaiʻi, especially LGBTQ youth, are at risk for injection drug use.

PREVALENCE OF DRUG USE AND OTHER RISK BEHAVIORS AMONG ADULTS

Measures of injection drug use among adults are less available compared to data related to youth. The Substance Abuse and Mental Health Services Administration (SAMSHA) conducts the National Survey on Drug Use and Health annually across the country and provides state-level prevalence estimates of drug use among youth and adults. While this

data provides a snapshot of substance use in the state, no question asked about how these substances were used (i.e., injection use). SAMHSA estimated 7.0% of adults over 18 in the state had a substance use disorder in 2016-2017. During the same time period, an estimated 3.4% of adults misused pain relievers in the past year, but only 0.5% had pain reliever use disorder. Prevalence of heroin use among Hawaiʻi adults was 0.3% while an estimated 0.8% used meth or ice in the past year and 2.0% had used cocaine.[9] Continued monitoring and data collection by HHHRC helps to fill gaps in our understanding of PWID in the state, their needs, and how best to develop and implement interventions related to harm reduction and/or prevention.

OVERDOSES NATIONALLY AND IN HAWAIʻI

Nationally, data from the CDC WONDER database the number of opioid overdose deaths has steadily increased from 8,048 in 1999 to 47,600 in 2017. At the same time, the number of overdoses due to prescription opioids also has increased, from 3,442 to 17,029 over the same time period. Figure 2 shows two slides from CDC which shows these national trends over time.[10]

Figure 3. **National Drug Overdose Deaths Involving Any Opioid,** Number Among All Ages, by Gender, 1999-2017

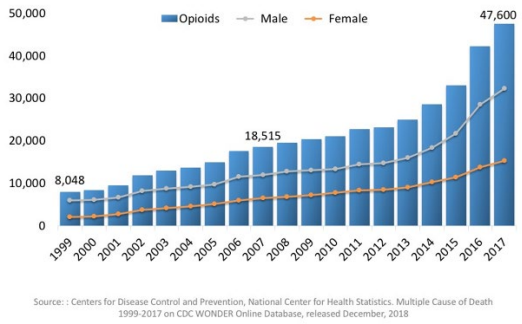


Figure 4. **National Drug Overdose Deaths Involving Prescription Opioids,** Number Among All Ages, 1999-2017

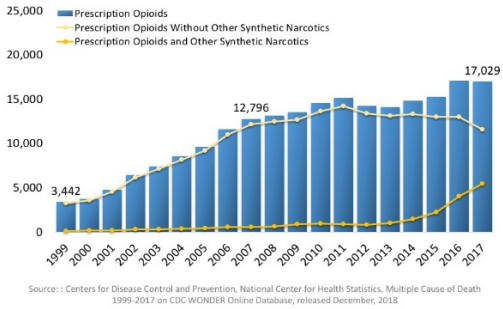


Figure 2. National opioid death and prescription opioid death data, 1999-2017. Slides via the National Institute on Drug Abuse, Data from CDC Wonder Database.

In Hawaiʻi, the CDC WONDER database shows unintentional drug overdoses have steadily increased, once accounting for 3.0 deaths per 100,000 in 1999 to 11.1 deaths per 100,000 in 2017.[11] From 2010-2014, 91% of poisoning deaths in Hawaiʻi were caused by drugs or medications, surpassing deaths from motor vehicle traffic-related incidents. Pain relievers, such as oxycodone, contributed to 35% of drug related deaths.[12] from the state's first opioid initiative response plan shows 73% non-fatal overdoses in the state between 2012-2016 involved opioid pain relievers.[13] More recent data from August 2017 through the beginning of August 2018 shows that 59 opioid-related fatal overdoses occurred in the

state, along with 384 non-fatal overdoses. In addition, 1,332 persons were treated with naloxone to reverse an overdose by EMS.[14]

While there has been increased federal regulation of prescription opioids nationally, new guidelines for providers in prescribing pain medication,[15] and increased lawsuits against pharmaceutical companies that manufacture pain relievers,[16] many persons still addicted have moved over to the illegal drug market where supplies have been found to be tainted with the cheaper and stronger drug Fentanyl.[17] Additionally, self-reported fentanyl use has increased over time.[18] HHHRC began offering trainings and education on overdose prevention/reversal in 2016. More information on this program are included in the section on Naloxone and Naloxone Refill Databases (pg. 12).

NATIONAL AND LOCAL HIV/STAGE 3 HIV (AIDS) SURVEILLANCE OVERVIEW: PROGRAM EFFECTIVENESS

To estimate the effectiveness of HHHRC syringe exchange program, we compared HIV and AIDS cases among PWID in Hawaiʻi to national surveillance data. At the beginning of the epidemic, only AIDS data was available as HIV was not a reportable condition during the first 20 years of the epidemic. This limits comparison of historical data as some people may never progress to Stage 3 HIV (AIDS) given advances in pharmaceutical therapy. Therefore, examining Stage 3 HIV (AIDS) cases likely does not reflect current trends. However, this data can help in understanding the epidemiology of HIV, especially risk factors for transmission and acquisition.

Since the start of the epidemic through 2017, there have been 1,281,787 cases of AIDS or Stage 3 HIV as defined by the US Centers for Disease Control and Prevention in the US plus 6 dependent areas, which include American Samoa, Guam, the Commonwealth of Northern Mariana Islands, Puerto Rico, the Republic of Palau, and the US Virgin Islands. Approximately 729,796 (56.9%) of persons who have ever been diagnosed with AIDS/Stage 3 HIV have died. In 2017, there were 17,803 incident Stage 3 HIV/AIDS cases nationally, of which 9.7% were attributed to injection drug use (IDU) (968) or combined men who have sex with men (MSM)/IDU (766).[19] In Hawaiʻi, the incidence rate of Stage 3 HIV/AIDS was 2.9 per 100,000 persons in 2017. Of the 41 cases with an AIDS diagnosis in 2017, only one case was related to IDU (2.4%). No Stage 3 HIV/AIDS cases related to MSM/IDU risk were reported in 2017. Since reporting began in 1983, 16% of all incident Stage 3 HIV/AIDS cases in Hawaiʻi were attributable to IDU or MSM/IDU.[20]

Hawaiʻi changed its reporting requirement for HIV cases in 2008,[21] which led to the reporting of HIV cases by name and provides a more precise picture of those living with HIV

in Hawaiʻi. At the end of 2016, CDC estimates there were 1,100,000 persons living with HIV in the United States, of whom 14% were unaware of their status.[22] In Hawaiʻi, a reported 2,393 people were living with HIV through the end of 2016, while in 2017, there were 104 new HIV cases reported in the state (7.3 per 100,000).[20] Nationally in 2017, there were 1,373 new HIV cases related to IDU and 1,252 related to MSM/IDU, or 6.8% of all infections that year.[19] In contrast during the same time period, 5 of Hawaiʻi's 104 incident HIV cases (4.8%) were attributable to either IDU or MSM/IDU. Through 2017, 8% of incident HIV cases have been attributable to IDU while 6% were directly related to MSM/IDU.[20]

Hawaiʻi had slightly lower incidence of new HIV diagnoses and Stage 3 HIV/AIDS among its IDU and MSM/IDU populations in 2017, which could be attributed to the state's proactive efforts to implement a SEP starting in 1989. Starting SEP can limit the transmission of HIV,[23] particularly in areas with low seroprevalence of HIV.[24] Results from previous HHHRC HIV seroprevalence studies found a HIV+ seroprevalence between 0.0% and 5.8% among study cohorts. Together, the evidence of HIV transmission in the state among PWID suggests that the provision of sterile syringes, injection equipment, and other services through the SEP project assists in reducing HIV prevalence among PWID and transmission to sexual partners and children. Not only has the HIV prevalence among PWID accessing the SEP continued to be low, having lower numbers of active PWID living with HIV decreases the infection risk for other PWID (and their partners). Access to sterile syringes and other equipment decreases HIV-related risk behaviors, such as sharing used needles.[23,25-26]

The provision of sterile syringes and injection equipment does not erase injection-related risk completely. Maintaining low HIV prevalence among PWID lower the risk for HIV infection among other PWID should they engage in high risk activities such as sharing equipment. Studies show SEP participation decreases risky drug preparation behaviors and repeated reuse of syringes, and less likelihood to share equipment.[27] Secondary exchange (also known as "gatekeeping"), or exchanging syringes for others, is another method shown to reduce risk practices. One study found those participating in gatekeeping had lower odds of risk practices such as syringe reuse or receptive needle sharing compared to PWID who did not participate in a SEP.[28]

In addition to helping prevent the spread of HIV, syringe exchange programs have been found to also decrease the spread of other blood borne pathogens, such as HCV.[29-30] Nationally, the CDC estimates that in 2017 there were 3,186 reported acute HCV infections, with an estimated 44,300 cases that have gone unreported. CDC also estimates 2.4 million people had a chronic HCV infection between 2013-2016.[31] Local data on the prevalence of HCV were not available, but one figure from 2016 indicates an estimated 23,000 people living in Hawaiʻi were living with chronic HCV.[32] Results from previous seroprevalence

evaluations found 65% to 89% of clients screened positive for HCV since testing began in 2007.

Other factors likely help to maintain the low prevalence of HIV among HHHRC SEP participants. In addition to providing sterile syringes, SEP staff also assist in the distribution of condoms which can prevent sexually transmitted infections. Newer services, such as HHHRC Wound Care Clinic provide additional touchpoints and supports for the state's PWID community. Wound care services help to prevent other skin and soft tissue infections which have been increasing nationally among PWID.[33]

Perversely, the efficacy of needle exchange is demonstrated by locations *without* policies in place for SEP. The HIV outbreak in Scott County, Indiana that started in late 2014[34] and increased HCV infection across Appalachia between 2006-2012[35] provide examples. The HIV outbreak in Indiana was originally reported in the *Morbidity and Mortality Weekly Report* found 84% of HIV cases were co-infected with HCV. In addition, the epidemiological investigation conducted in Scott County found drug use in the community was multigenerational, and practices included crushing and cooking oxymorphone tablets not meant for injection.[36] Ultimately, 190 persons contracted HIV[37] in a county of 4,200 at the time of the outbreak.[36]

In Appalachia between 2006 and 2016, cases of HCV increased 364% among people 30 years and under in Kentucky, Tennessee, Virginia, and West Virginia. Researchers found 73% of cases were attributable to IDU.[38] Government sponsored syringe exchange only began in 2015 in Kentucky, and in 2017 in Tennessee and Virginia.[39] West Virginia has spotty coverage for SEP,[39] including the suspension of SEP in some jurisdictions leading to self-reports of increased risk-taking regarding IDU.[40] These examples provide stark evidence of the importance and value of continued SEP and harm reduction practices in Hawaiʻi.

2018 SYRINGE EXCHANGE PROGRAM EVALUATION

DATA SOURCES AND METHODS

The timeframe for the annual report is January 1, 2018 through December 31, 2018. During 2018, HHHRC Syringe Exchange Program staff collected data which was entered into different databases and these databases comprise the data used in this report. Below is a list of these databases, followed by the analysis plan to answer evaluation questions, plus information about the statistical analyses.

HHHRC maintains databases from the following sources for this evaluation:

- **Daily Logs:** Daily logs are used to capture information about number of syringes exchanged daily; supplies for harm reduction, including pipe covers, hygiene kits, first aid supplies, and condoms; and, types of outreach contacts related to youth and gay men. Additional data, including participant card number and participant demographics are also collected. Lastly, information about secondary exchange, or "gatekeeping," is collected to better measure the reach of the program.
- **Participant Card Registry:** Starting in 2012, HHHRC began to distribute participant cards with a unique alphanumeric identifier ("participant ID"). Registering a card is optional, but even with a card, participants remain anonymous. Registrants provide basic demographic data and report on their injection drug practices. The card bears information related to Hawaiʻi Revised Statutes §325-114 which legalized syringe exchange in the state and allow for amnesty for syringes if participants are stopped by the police. For more information, see Figure 3. Participant IDs are also captured in the Daily Logs, which when linked together provides a snapshot of who exchanged during the program year. In SEP2016, 1,085 participants exchanged using a card, which increased to 1,274 in SEP2017. When reporting below, "SEP2018" refers to participants who exchanged using a participant ID in 2018.
- **Naloxone and Naloxone Refill Databases:** In September 2016, HHHRC began its naloxone program, first providing group and individual trainings with PWID on injectable naloxone during outreach or syringe exchange. Trainings were expanded to include social service providers, law enforcement, friends and family of PWID, and other community members. Data collected during trainings include demographics, overdose risk factors and history. In a naloxone refill event, information about use and circumstances, loss, or dosage expiration are collected.
- **Outreach, Testing, and Linkage (EvaluationWeb Databases):** HHHRC provides HIV and HCV outreach, testing, and linkage (OTL) as part of its portfolio of services. These services are offered through the main office on Oʻahu. HHHRC also hosts health fairs around Honolulu where HIV/HCV screening is provided along with a host of other services. On neighbor islands, participants who wish to get tested are referred to HDOH testing sites. During testing, demographic, risk factors, screening results and referrals are reported to HDOH's EvaluationWeb database. As EvaluationWeb does not collect referral information, it is not possible to report on neighbor island testing activity driven by HHHRC SEP workers. Thus, information provided in this evaluation reflect OTL on Oʻahu only.

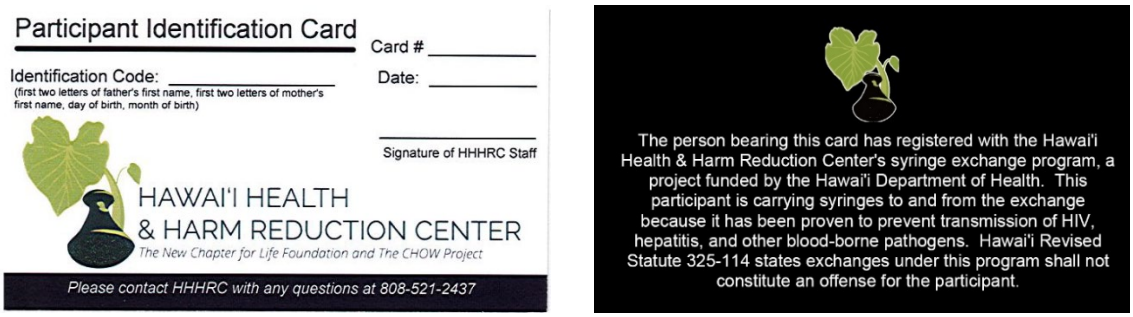


Figure 3. HHHRC SEP Participant Identification Card. The identification card summarizes the Hawaiʻi Revised Statute that allows participants to carry syringes to and from the exchange: *"The person bearing this card has registered with the Hawaiʻi Health & Harm Reduction Center, a statewide syringe exchange program funded by the Hawaiʻi Department of Health. This participant is carrying syringes to and from the exchange because it has been proven to prevent the transmission of HIV, hepatitis, and other blood-borne pathogens. Hawaiʻi Revised Statutes §325-114 provides that exchanges under this program shall not constitute an offense for the participant."* The participant card has been reported to offer participants limited amnesty when they are stopped by police and allows them to keep syringes they have in their possession.

Analysis Plan & Statistical Analyses

To understand syringe exchange program participation, data from the Daily Logs are used. Frequencies were reported to provide process data and give a snapshot of exchange volume and other pertinent information from 2018. To examine demographic differences among participants, data from the Daily Log and Participant Card Registry were linked and bivariate analyses performed, using both t-tests and chi-square tests for differences when appropriate. Descriptive statistics from the naloxone registry and refill databases, and HIV and HCV screening data from the EvaluationWeb system are reported. All analyses were run in Stata 15.1 (StataCorp, College Station, TX). Statistical significance was set at $\alpha = 0.05$.

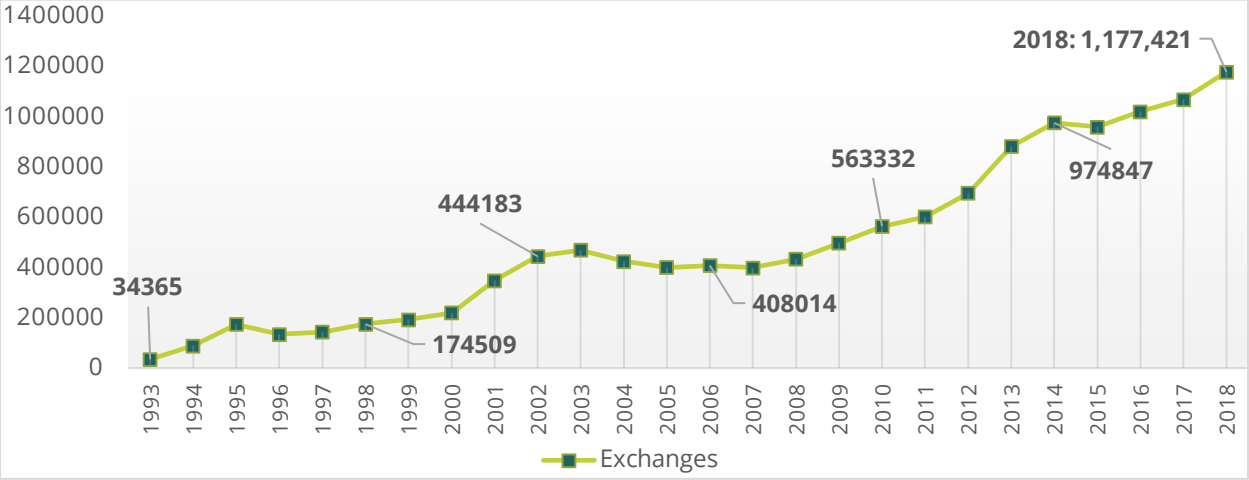
Race and Ethnicity Reporting in Hawaiʻi

This report uses HDOH's methods to report Native Hawaiians, wherein any person reporting Native Hawaiian ancestry is reported as Native Hawaiian.[41] Participants who indicated being of two or more racial groups (other than Native Hawaiian) were coded as multiracial. In 2018, participants were provided with a multiracial category to report under if so desired.

SYRINGE EXCHANGE ACTIVITY IN 2018

A record 1,177,421 syringes were exchanged in 2018, up from 1,068,621 syringes exchanged in 2017, reflecting a third year of growth after a small dip in 2015 (Figure 4). In terms of visits, November 2018 was the busiest month with 1,235 visits, but April had the heaviest volume of syringes exchanged at 111,945.

Figure 4. The total number of syringes exchanged statewide from 1993-2018.



The number of visits increased in 2018 to 13,381, a 6.7% increase over the 12,543 visits in 2017 (Table 1). Participants exchanged an average of 88 syringes per visit. Of all visits, only 2,709 (20.25%) reported gatekeeping, down from 3,696 in 2017, a 26.7% decrease in gatekeeping exchanges. By volume, a total of 634,059 gatekept syringes were exchanged, down 11.6%. Those who gatekept reported exchanging for a possible 8,575 additional people, up 28.5% from 2017, which shows the continued importance of the SEP in providing gatekeeping services for PWID that HHHRC may not reach directly.

There were 288 participants who registered for a participant ID card in 2018, of whom 171 people indicated it was their first time visiting the program. Among first time visitors, 49 were between 19 and 25 years old, over double the number of new youth exchangers in 2017.

By site, Oʻahu had the largest number of exchanges (10,382) and handled the largest volume of syringes exchanged (522,870). While the average number of syringes exchanged had dropped from a high of 86 syringes exchanged in 2014 to 47 syringes exchanged in 2017, this number ticked up to 50 syringes exchanged per visit in 2018. Moderate increases in visits and exchange volume occurred on Maui but increased by 41% on Kauaʻi. In East Hawaiʻi, a 24% increase in exchange volume occurred, likely related to a staffing delay in 2017.

Table 1. Number of exchange visits, first visits, syringes exchanged, and average number of syringes exchanged from 2016-2018

Exchange Site	Year	Total Visits N (%)*	First Visits N (%)*	Syringes Exchanged N (%)*	Average Number of Syringes Exchanged Per Visit N**
Statewide	2018	13,381	173 (1%)	1,177,421	88
	2017	12,967	135 (1%)	1,068,621	83
	2016	11,120	133 (1%)	1,020,286	92
Oʻahu	2018	10,382 (78%)	94 (<1%)	522,870 (44%)	50
	2017	10,401 (80%)	60 (<1%)	487,041 (46%)	47
	2016	8,591 (77%)	41 (<1%)	455,022 (45%)	53
East Hawaiʻi	2018	597 (4%)	15 (3%)	233,867 (20%)	392
	2017	526 (4%)	13 (2%)	188,824 (18%)	339
	2016	636 (6%)	8 (1%)	220,220 (22%)	347
West Hawaiʻi	2018	1,046 (8%)	35 (3%)	125,151 (11%)	120
	2017	1,024 (8%)	10 (<1%)	139,139 (13%)	136
	2016	836 (8%)	34 (4%)	113,266 (11%)	136
Maui	2018	765 (6%)	13 (2%)	176,685 (15%)	231
	2017	505 (4%)	22 (4%)	170,669 (16%)	338
	2016	690 (6%)	31 (5%)	159,114 (16%)	231
Kauaʻi	2018	591 (4%)	16 (3%)	118,548 (10%)	201
	2017	511 (4%)	30 (6%)	83,908 (7%)	165
	2016	367 (3%)	19 (5%)	72,264 (7%)	197

**Percentages reflect column percentages, except for the "first visits" column, which represents the percent of total visits that were first visits. **The average number of syringes have been rounded up to the nearest whole integer.*

Outreach workers also provide other services to participants such as the distribution of safe injection equipment. In 2018, condoms were passed out during 2,215 (17%) visits, pipe covers at 1,204 (9%) of visits, hygiene kits at 2,373 (18%) visits, and first aid kits at 4,185 (31%) of visits.

DEMOGRAPHICS AND SELECTED RISK FACTORS

In 2018, participants presented a Participant ID Card or unique identifier at 11,455 exchange visits, or on 86% of exchanges, representing 1,483 unique participants. Of these individuals, 1,349 (91%) were matched to the Participant ID Card database. This section of

this report discusses demographic and risk factor differences between these 1,349 individuals who exchanged in 2018 (hereafter referred to as "SEP2018") compared to those who registered but did not exchange in 2018 (n = 1,423).

The number of SEP2018 visits by participants who exchanged using an ID Card ranged from one to 215 visits, with an average of 33 visits exchanging a total of 1,040,271 syringes over the year. Those who did not use a Participant ID Card in 2018 exchanged an average of 55 syringes per visit while SEP2018 on average exchanged 96 syringes per visit. Those exchanging with a Participant ID Card reported gatekeeping on nearly 21% of visits while 19% of visits for those exchanging without a card reported gatekeeping. The average number of syringes exchanged by an SEP2018 participant was 268.

In 2018, 289 card registration occurred. These individuals plus previous registrants since 2012 comprise the unique participants in SEP2018. Interestingly, 34 participants with participants cards accessed SEP services at multiple sites, with only 4 (12%) of these visiting the West and East Hawaiʻi locations. The remainder would exchange mostly on Oʻahu or Kauaʻi.

Among those who registered for a Participant ID Card in 2018, 171 (62%) said they were first time visitors to the SEP. Compared to last year, less participants who accessed the program for five or more years registered for a Participant ID Card (10% in 2018 versus 20% in 2017). This may reflect that more long-term participants may have already registered for the card, but further data collection is needed to examine whether this is a trend.

Those who exchanged as part of SEP2018 were between 19 and 79 years of age. The average age of a client in 2018 was 43 years which was not significantly different from those who did not access the exchange in 2018. Traditionally the SEP population has been an aging population, but many of the sites anecdotally report an increase in youth participants. As mentioned previously, 49 first time visitors in 2018 were ≤25 years of age.

Among those for whom we had demographic data, SEP2018 participant gender did not vary significantly when compared to those who did not access the exchange. In 2018, 65.3% were male, 33.5% were female, and 1.2% were transgender. Again, participants who accessed SEP versus those who did not access in 2018 did not significantly vary in terms of the racial/ethnic groups. Most SEP2018 participants were White (45.2%), followed by Native Hawaiian/Part Native Hawaiian (25.2%), multiracial (13.8%), or Asian (7.0%; Figure 5). SEP2018 participants were mainly from the continental US (50.4%), but 43% were born in Hawaiʻi. Just under 6% were foreign born, and less than 1% were from other Pacific Islands.

There were significant differences between those who accessed the program in 2018 and those who did not in terms of housing ($p < 0.01$). Larger proportions of those who were homeless (36.8%) or temporarily/unstably housed (21.5%) accessed the program compared to those who did not (31.7% and 19.5%, respectively). HHHRC has partnered with social service organizations who outreach to those who are homeless or marginally housed to get them into housing. Of note, 49% of those who *did not* access the program in 2018 reported being permanently housed, which may play a role in syringe access.

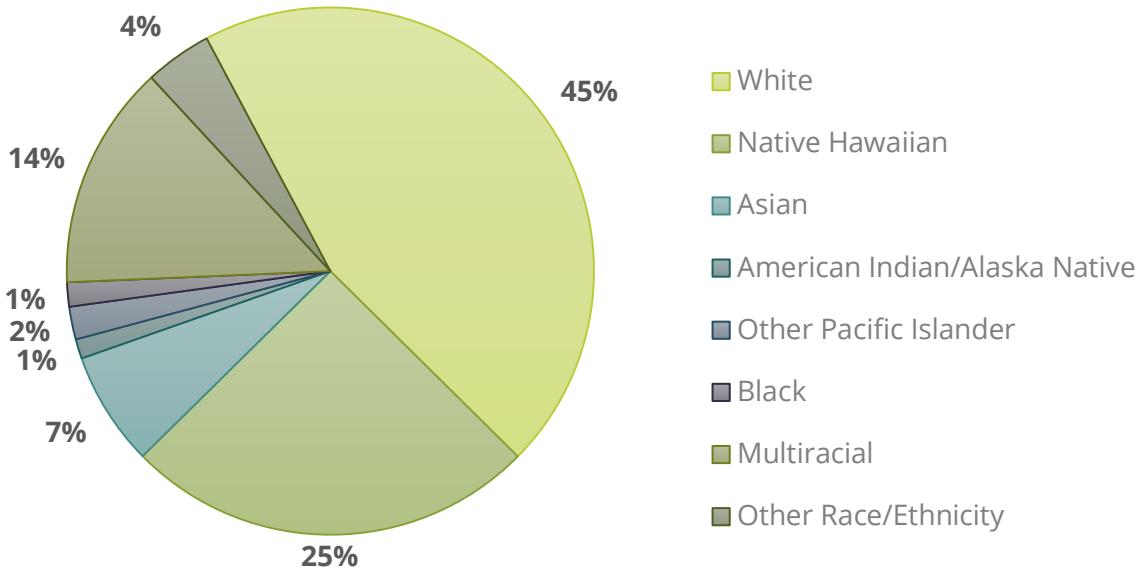


Figure 5. Race/ethnicity breakdown for participants who were in contact with the SEP in 2018

Table 2. Differences in most preferred drug by those who exchanged and did not exchange in 2018

	Exchanged in 2018		
	Yes	**No**	
Total	**1338 (48.74)**	**1407 (51.26)**	**2745 (100)**
Heroin	590 (44.1)	485 (34.47)	1075 (39.16)
Meth/Ice	423 (31.61)	359 (25.52)	782 (28.49)
Pills (Opioids)	203 (15.17)	265 (18.83)	468 (17.05)
Other	44 (3.29)	142 (10.09)	186 (6.78)
Not inj (GATE)	35 (2.62)	51 (3.62)	86 (3.13)
Not inj (NARCAN)	13 (0.97)	69 (4.90)	82 (2.99)
Opioid (Other)	10 (0.75)	9 (0.64)	19 (0.69)
Cocaine/Crack	9 (0.67)	5 (0.36)	14 (0.51)
Speedballs	5 (0.37)	1 (0.07)	6 (0.22)
Polydrug Use	4 (0.30)	8 (0.57)	12 (0.44)
Refused	2 (0.15)	13 (0.92)	15 (0.55)

For those who reported their employment status, 64.5% of participants reported not being employed compared to 56.2% of those who did not access the program ($p < 0.001$). Among those who were employed,

significantly more reported being in labor (29.8%), service (18.4%) or in professional/office field (19.8%) than those who did not access the program ($p < 0.001$). This significance is likely due to the number of participants who indicated they were in the social services field but did not access the program in 2018 (2.3% vs. 15.9%, respectively). Some of these people may have registered to gatekeep and have since moved onto a different job or registered for naloxone but may not access the SEP, which may account for the statistically significant differences.

An overwhelming majority of those who accessed the program had health insurance in 2018 (96.6%). Although nearly all SEP2018 participants were insured, previous HHHRC SEP evaluations indicated program participants had high emergency room utilization and low preventive and regular health checkups,[42] which led to the HHHRC Wound Care Program. Open wounds are a major issue for SEP participants. Evaluation findings from the Wound Care Program demonstrate that for each nickel spent on Wound Care at HHHRC was equal to a dollar spent in emergency room care.[43]

Table 3. 2018 Naloxone training participants and selected demographics and risk factors.

	Number of 2018 Trainees: 259
Demographics	
Female	50.19%
Male	48.65%
Transgender	1.16%
Race/Ethnicity	
White	36.68%
Native Hawaiian	20.46%
Asian	15.44%
Multiracial	12.74%
Other Pacific Islander	5.79%
Other	4.25%
Any substance use in the past 30 days	
Yes	52.12%
No	47.88%
Current Substance Use (Past 30 days)*	
Heroin	78.23%
Methamphetamine/Ice	45.16%
Other Opiates (e.g. Pills)	28.23%
Benzodiazepines	20.16%

Significantly more SEP2018 participants reported their most often injected drug was heroin (44.1%) compared to those who did not access the program (34.5%; $p < 0.001$). The proportion reporting methamphetamines or ice were their most frequently injected drug was 31.6%, compared to 25.52% among those that did not access the program. Less than 4% of those who exchanged on a card in 2018 reported gatekeeping or accessing naloxone (see Table 2).

Methadone	20.16%
Alcohol	12.90%
Suboxone	10.48%
Other	8.06%
Crack/Cocaine	3.23%
Injection Practices**	
Always inject in Private Location	32.20%
Always inject in Public Location	5.93%
Inject in Either Location	61.86%
Use Alone**	
Never	16.95%
Sometimes	65.25%
Always	17.80%
Time off from using substances (past year)* - Yes**	53.98%
At-risk for overdose***	59.83%

*Among participants who reported using substances in the last thirty days (n=124).
**Among participants who reported using any substances in the last thirty days who responded to this question/were assessed (n=118).
***Among those who answered this question (n=113).

NALOXONE TRAINING AND REFILLS

Since September 2016 through the end of 2018, HHHRC trained 717 people on overdose prevention, including rescue breathing and naloxone administration, of whom 259 were trained in 2018 (Table 3). In 2018, we did not have a question asking participants specifically if they were a service provider, meaning the data presented combines both SEP participants and service providers together. In future evaluations we will be able to disaggregate these groups.

A majority of those trained were female (50.2%), followed by men (48.7%), and transgender women (1.2%). Over a third were White (36.7%), while 20.5% were Native Hawaiian, 15.4% were Asian, and 12.7% were multiracial.

Trainees are asked about their overdose risk or overdose risk to others. One of these questions is on current substance use. Over 47.88% reported not using any substances in the previous 30 days; many of whom were social service providers or family members or loved ones of PWID. Among those reporting substance use, 37.1% reported monodrug use while the 62.9% reported polydrug use. Polydrug use has been associated with an increased risk for overdose[44] and associated with increased risk for HIV.[45] Of those who reported using any substances in the past 30 days, the most popular was heroin (78.2%) followed by methamphetamine or ice (45.2%). Other opiates (28.2%), methadone, and benzodiazepines (20.2% each) rounded out the top five substances reported used.

Nearly a third of participants (32.2%) reported using a private location such as a home, apartment, or hotel room. A large proportion (61.86%) reported using in either a public or private location. Public locations included parks, public restrooms, cars, or on the streets.

Over three-quarters of participants reported using alone always (17.8 %) or sometimes (65.3%). More than half (54.0%) of participants reported taking time off from using during the past year because of going to jail or treatment, or simply cutting down use. Cutting down or taking time off can be dangerous since tolerance decreases during the time off, leading to an increase in one's risk for overdose.[46-47] Among those who were using, nearly 3 in 5 were at risk for overdose.

Overdose History

During training sessions, HHHRC collects data on overdose history, either personal overdose or witnessing an overdose. In 2018, over a third of participants had never witnessed an overdose (39.68%). The remaining 60% had either witnessed an overdose, had an overdose, or both. For this analysis, those who had both witnessed and had overdosed themselves were categorized as having overdosed previously. Out of 152 trainees, 61.8% had witnessed an overdose while 38.2% had overdosed previously (Table 4).

Trainees reported experiencing between one and 20 overdoses, with a median number of 2 overdoses and an average of 3 overdoses. Among trainees who knew why they overdosed, 22% reported mixing drugs, 15% taking too much or overindulging, 15% reported attempted suicide, and 14% reported the strength of the drugs. Over half of trainees (53.5%) who had previously overdosed reported that naloxone was used, while nearly a third who had witnessed an overdose (30.9%) reported naloxone was used. Among those who did overdose when naloxone was used, 48.4% reported EMT personnel administered the dose, followed by a layperson (32.3%), and lastly emergency room staff (19.4%).

Among those participants who had previously overdosed, nearly two-thirds (65.52%) reported having used heroin during their last overdose, while 10.3% reported prescription opioids or benzodiazepines, and 12.1% reported using methamphetamines/ice. One-in-five participants reported polydrug use (22.4%). Similar proportions of participants who had witnessed an overdose reported heroin (60.6%) or multiple drugs (22.3%) were used. More reported other opioids or benzodiazepines (19.2%) and less reported methamphetamines or ice (5.2%). Only 5% reported their overdose was due to fentanyl. For those who overdosed, 27.8% reported having CPR performed on them, followed by being physically hit or slapped (13.0%). Among those who witnessed an overdose, 31.9% reported physically slapping or hitting the person who was experiencing the overdose, followed by CPR (27.7%), and having a medic revive the person (14.9%). More troubling, 12.8% of people who witnessed an overdose reported nothing was done; providing naloxone training can help to remediate this inaction. Among those who reported a previous overdose, locations

included in public including cars or on the street (36.4%), one's own residence (32.7%), in a hotel (14.6%), or someone else's home (12.7%).

Table 4. Participants who experienced one or more overdoses, and participants who witnessed one or more overdoses, by select demographics, risk factors, and protective actions.

	Trainee-Witnessed Overdose	Trainee Previously Overdosed[a]
	94 (61.84)	**58 (38.16)**
Demographics		
Female	53.19%	65.52%
Male	44.68%	32.76%
Transgender	2.13%	1.75%
Race/Ethnicity		
White	38.30%	44.83%
Native Hawaiian	14.89%	22.41%
Multiracial	14.89%	18.97%
Asian	15.96%	5.17%
Other Pacific Islander	5.32%	3.45%
Missing	4.26%	5.17%
Other	6.38%	0.00%
Drug(s) Used		
Heroin (alone or with another substance)	60.64%	65.52%
Multiple	22.34%	22.41%
Meth (alone or with another substance)	5.20%	12.07%
Other Prescription opioids or benzos (alone or with another substance)	19.15%	10.34%
Naloxone Use		
Yes	30.85%	53.45%
Other Actions		
CPR	27.66%	27.78%
Physically Slap/Hit	31.91%	12.96%
Medic Revive	14.89%	5.56%
Did nothing	12.77%	3.70%
Cold Shower/Ice	11.70%	3.70%

[a]Includes those who *both* witnessed *and* previously experienced an overdose.

Lastly, participants are asked if they knew anybody at risk of overdose. Over half (53.3%) reported that a friend was at risk for overdose, followed by an SEP participant that they knew (36.8%), a family member (19.1%), or a partner (13.2%).

Naloxone Refills

Upon completing the naloxone training, participants are provided two units of 4ml nasal naloxone. If the naloxone is used, given away, lost, stolen, or expired, participants are welcome to access refills through the SEP. In sum, 361 refill naloxone units were distributed in 2018 to 161 participants who used a Participant ID Card or some other identifier, or 22.5% of all those HHHRC has trained since the start of the naloxone training program. Of the 361 units distributed to those who were registered in 2018, the reasons for replacement were lost, stolen, or given away (30.1%), used (31.0%), or both (3.9%). The remainder had no reason provided. A total of 79 participants reported at least one of their doses were stolen, 35 reported distributing at least one dose, and 32 reported losing at least one dose. In future evaluations we plan to ask participants to estimate how many doses were lost, distributed, or stolen.

Table 5. Demographic, risk factors, location, and results of naloxone administration by HHHRC overdose prevention-trained participants requesting a refill, 2018.

	Refill Requests Due to Use
Total	**n = 82**
Gender	
Male	60.98%
Female	23.17%
Multiple Persons	7.32%
Relationship	
Friend	67.07%
Partner	8.54%
Other	8.54%
Stranger	7.32%
Self	3.66%
Age	
Under 40	37.80%
40 and Over	59.76%
Drug used before overdose	
Heroin	92.68%

A total of 65 people using an identifier reported using naloxone across 82 refills, or 126 doses. Because participants are provided multiple doses and could have used one or both doses of naloxone or reversed multiple overdoses, it is more difficult to tease out how many actual overdose incidents occurred. The data in Table 5 provides more information the people who overdosed where an HHHRC naloxone dose was used (based on the 82 refill requests processed across the 65 participants). Nearly 61% of those who received a naloxone dose were men, 23.2% were women, and the remainder of the doses were distributed to multiple people. Most people reported using their naloxone on a friend (67.1%), while smaller proportions reported providing to a partner (8.5%), stranger (7.3%), or some other person (8.54) like an SEP

Benzodiazepines	19.51%
Methamphetamines/Ice	19.51%
Alcohol	3.66%
Opioids (other)	2.44%
Overdose location	
Private residence	54.88%
Other setting	21.95%
Public Park/Restroom	12.20%
SRO/Hotel Room	3.66%
Other Actions Taken	
Sternum rub	32.93%
Rescue breathing	30.49%
Call 911	24.39%
Doses Administered (average)	1.68
Duration of Naloxone Use	
<1 minute	17.01%
1 to 3 minutes	23.17%
3 to 5 minutes	15.85%
>5 minutes	28.05%
Outcome of Overdose	
Woke up because of trainee	75.61%
Woke up because of health professional	4.88%
Died	1.22%
Results After Reversal	
Anger	23.17%
Dopesick	8.54%
Vomiting	4.88%

client or a family member. Three refills (3.7%) were due to participants using the naloxone on themselves. Most people who received a dose were 40 or over in age (59.8%).

In nearly all cases of naloxone use (92.7%), participants reported heroin was the drug used before the overdose event, while benzodiazepines and/or methamphetamines or ice were reported in 19.5% of overdose incidents. Naloxone was mainly used in homes or other residences (54.9%), followed by some other setting (21.95%), which included names of towns or a treatment facility. Just over one-in-ten (12.2%) reported the application of naloxone in a public place or restroom. Other actions taken during an overdose included rubbing the person's sternum (32.9%), rescue breathing (30.5%), and/or calling 911 (24.39%). Number of naloxone doses used in an overdose ranged from 1 to 3 doses, with an average of 1.68 administered. Most people awoke after 5 or more minutes of application of naloxone (28.1%).

Three-quarters of overdose reversals (75.6%), were due to the naloxone trainee's help, **representing a possible 62 lives saved**. Still, two people reported some issues using injectable naloxone, which were separation of the needle from the syringe or difficulty in performing the injection. Those needing a refill due to naloxone use reported that in nearly a quarter of cases that the person whose overdose was reversed awoke angry (23.2%), while less than a tenth reported the person being dopesick (8.5%) or vomiting (4.9%). Compared to last year's report where 4% of participants reported being harassed by police and 1.2% being arrested, no participants were harassed by police or EMT staff, nor were arrested in 2018.

HIV AND HCV OUTREACH, TESTING, AND LINKAGE SERVICES

In sum for 2018, 59 people were screened for HIV and 60 were screened for HCV, with 40 persons screened for both infections.

HIV Outreach, Testing, and Linkage

Of the 59 HIV screenings conducted in 2018, the most were with those aged 30 to 39 years (33.9%), equal proportions were 20 to 29 years old or 50 to 59 years old (22%). The average age of those who accessed the SEP was 43, but only 17% who tested in 2018 were between 40 to 49 years old. The majority of those who received an HIV test with SEP identified as White (28.8%) or multiracial (28.8%), followed by Native Hawaiian or other Pacific Islander (22.0%). The majority of those who were tested in 2018 identified as male (52.5%), followed by female (32.2%), and transgender (15.3%). Over two-thirds (69.5%) of those who were screened in 2018 reported having an HIV test, down from 76.2% of 2017 participants. Everyone who had reported being previously tested reported their results were negative. Just over one-tenth (10.2%) identified as MSM, nearly half (47.5%) reported usually having sex without a condom, and 17% reported having sex with PWID. Nine of those who were tested (15.3%) reported injection drug use, and 4 of these people (44.4%) reported sharing injection drugs. Everyone who was tested for HIV by SEP was negative.

HCV Outreach, Testing, and Linkage

Of the 60 persons tested for HCV, 40 were also tested for HIV. Among those who were screened, just over half were 40 years of age or older (51.7%), which is older than the population screened for HIV. Exactly one-fifth (20%) of screenings were with those between 20 and 29 years old, and 28.33% were between 30 and 39 years old. A third of participants identified as Native Hawaiian or other Pacific Islander (35.0%), 21.67% were White, and one-fifth were multiracial (20.0%). Half of those tested identified as male (50.0%), followed by female (36.7%) and transgender (13.3%). More than half (56.7%) of participants reported previously being screened for HCV, of whom 91.2% reported they had tested negative previously and three (8.8%) had tested positive for HCV previously. Just over 43% of participants didn't know their HCV status or had not been previously tested. Regarding risks for HCV, only 4 people tested identified as MSM and only 6 reported having sex with someone who injects drugs. Again, only 6 people reported injecting drugs, half of those reported sharing injection drugs equipment.

Despite the low reported risk factors, 28.3% of those tested (n = 17) were positive for HCV, of whom all were referred to medical care and confirmatory HCV testing. Three of these people were previously positive, one did not recall the outcome of their previous test, and two who had not tested previously were positive. Eleven (35.5%) of those who reported

their previous HCV test was negative tested positive in 2018. This is more than in 2017 who had HCV, but relatively less than in 2015 where 65% of evaluation respondents were positive for HCV. Further HIV and HCV testing of SEP participants is planned which should yield a better sense of the overall prevalence of both conditions among participants.

COST/BENEFIT ANALYSIS OF HAWAIʻI SEP

The average lifetime cost of HIV treatment was $367,134 in 2009,[48] or $430,989 in 2018 dollars when using the consumer price index calculator.[49] CDC estimated that Hawaiʻi spent $26,000,000 annually on HIV-related healthcare costs in 2009.[50] Several studies have estimated the cost savings from new HIV cases averted through SEP efforts, although none of those studies have been conducted in Hawaiʻi. One study from Washington, DC estimates that 120 HIV cases were averted in the two years after the city instituted SEP.[51] Another study estimated that Philadelphia's SEP program averted 10,592 new HIV cases and Baltimore's SEP program averted 1891 new HIV cases over ten years; authors estimated that the two programs had a combined one-year return on investment of $305.8 million.[52] Previous Hawaiʻi SEP evaluations posit that if the SEP were to avert as few as two new HIV infections per year, that would provide cost savings to the state.[53]

CONCLUSIONS

HIV/AIDS among PWID remains a major public health problem in many countries throughout the world and in the United States. Through 2017, the number of Stage 3 HIV infection (AIDS) attributable to injection drug use was 30.2%.[54] Hawaiʻi's decision to establish a syringe exchange program in 1989 targeting PWID has likely kept new diagnosed HIV cases related to injection drug use at less than the national average. The HHHRC HIV testing studies conducted between 2007 and 2016 found both a low prevalence and a low incidence (likely to be less than 1% per year) among PWID participating in the SEP.[55] The potential reach of sterile syringes to PWID across the state, given the volume of syringes exchanged, the number of participants, and the number of participants who report gatekeeping indicate that SEP reaches PWID who do not directly access the program. Providing consistent syringe exchange and access to participants via a variety of means likely contributes to low HIV infection from injection drug use in Hawaiʻi. Examples from Indiana[34-36] and Appalachia[35,37] provide stark reminders of how harm reduction principles and programs can avert HIV *and* HCV infection.

Prevalence of HCV has fluctuated over the course of HHHRC SEP. Past HHHRC evaluations reflect this, with a high prevalence of 88.7% in 2007 and 68% in 2016.[53] These findings fall within the worldwide range of 60% to 80% among PWID.[56] In 2018, 17 individuals tested for HCV were found to be infected; however, it should be noted that this number is based on

HCV testing data and not part of HHHRC's traditional prevalence estimates. The actual number of PWID with HCV in Hawaiʻi may be higher. More troubling, of those who had reported having a negative HCV test, 35% tested positive in 2018, and many of these new positives did not report risky behaviors. Continued monitoring of HCV among Hawaiʻi's PWID is required. As more pharmaceutical treatments and cures for HCV come online, identification of new infections and referral to treatment should remain a priority. Regardless, syringe exchange remains an effective way to minimize transmission of HCV.

Nearly a third (31.6%) of those who exchanged in 2018 reported their favored drug was methamphetamines or ice. State data shows 4.8% of public high school students currently use meth.[3] Data from the 2016-2017 National Survey on Drug Use and Health estimates 8,000 adults in Hawaiʻi has used meth in the past year.[57] Anecdotally, meth and ice use has been long part of Hawaiʻi's drug culture, so much so that two news organizations did multiple reports on the issue in 2016.[58] Meth's reemergence has also drawn national attention.[59] Meth use has been linked to lack of personal care,[60] violence,[61-63] and houselessness among both youth[64] and adults.[65] It is important to note that meth use is only one of multiple factors related to houselessness[66] and/or violence. For example, another risk factor for both meth use and houselessness includes adverse childhood events,[61] demonstrating the multifaceted nature of causes and effects of meth use. The intersection between houselessness and meth/ice use in Hawaiʻi is reflected in HHHRC SEP work as well. Among those who accessed the exchange in 2018, 56.7% who preferred meth were houseless, compared to 27.0% of those who reported favoring heroin or 29.1% who preferred other opiates (analysis not shown). While HHHRC will continue to get guidance from other harm reduction organizations on working with those who use meth, more needs to be done to understand the needs of this population.

Overdose was more acute among heroin users. Among those who were trained in delivering naloxone in 2018, over 60% who had witnessed an overdose and nearly two-thirds who experienced an overdose reported heroin as the main drug taken. In addition, among those who reported using naloxone distributed by HHHRC, over 90% reported heroin as the primary cause of the overdose. While these numbers represent a small subset of the SEP population, the Hawaiʻi Opioid Initiative reports that emergency medical services treated 1,332 patients in the state were treated with naloxone in 2017.[67] In 2017, the proportion of non-heroin nonfatal overdoses was projected to be 5.78 times higher than the number of nonfatal heroin-related overdoses,[68] while fatal overdoses due to prescription opioids accounted for 63.3% of overdoses.[69] Estimates from the National Surveys on Drug Use and Health show approximately 3,000 youth between 12 and 17 years old and 36,000 adults in Hawaiʻi misused pain relievers in the past year between 2016-

2017.[57] Because naloxone reverses opioid caused overdoses, continuing to provide naloxone trainings and refills remains an important priority, especially for persons using prescription opioids.

Lastly, 2018 saw a record high in syringes exchanged in Hawaiʻi. Data from the first three quarters of 2019 show that the SEP is on-track to exchange just as many syringes as in 2018. Whether or not this indicates syringes exchange volume is about to plateau remains to be seen. However, by providing new, clean, sterile syringes, Hawaiʻi's SEP reduces the risk of HIV and HCV transmission among PWID.

Limitations

There are limitations to the approach used in this evaluation. First, HHHRC provides multiple linkages to health and social service programs, but there is no way to accurately track those. Starting October 1, 2019, the Hawaiʻi Department of Health's Alcohol and Drug Abuse Division will roll out its Community Addiction Resource Entry System, which may be able to provide monitoring of referrals of SEP clients to substance use disorder programs. Second, ID card registrations limit our ability to say exactly how many people are part of the SEP. Though 2,772 cards had been distributed to participants through 2018, some participants may lose cards or re-register, there may be more cards than actual registrants, or cards with the same ID number were distributed, meaning there may be less cards than actual participants. Third, participants may provide the wrong ID number when exchanging. To address this issue, we checked whether demographic data in the exchange record matched the ID card registry. In cases where the card ID registry did not match the exchange log, those exchanges were not linked to an ID. This evaluation presents the most accurate information HHHRC has on the SEP based on the data available. Some of these factors may limit the generalizability of our evaluation findings to all who access the SEP, while this evaluation may better describe those who were willing to share their demographic data and other information with HHHRC.

RECOMMENDATIONS

Based on the findings above, the HHHRC SEP and policymakers should consider the following recommendations. The first set of recommendations are related to the SEP program specifically. The second set of recommendations relates to the larger policy and institutional issues the SEP program and its clients are embedded in day-to-day.

Recommendations directly related to SEP

The following set of recommendations can aide or expand the SEP's day-to-day functions.

- **At minimum, maintenance of current HHHRC SEP program components/portfolio should be continued, though record exchange volume**

points to a need for expansion. Since 1993, Hawaiʻi's syringe exchange program has shown itself successful in averting HIV infection among PWID. This can only continue with maintenance of SEP program components. This includes syringe exchange itself, plus distribution of injection equipment, condoms, first aid and hygiene kits, and other services provided by SEP. Exchange volume in 2018 hit a record high, and volume in 2019 is expected to be just as high. At minimum, policymakers and funders should continue to support the syringe exchange program, and even fund expansion of services to properly account for higher exchange volume. Expansion could also be achieved by reviving the gatekeeper program to train and compensate gatekeepers to extend the SEPs reach.

- **Naloxone trainings should be expanded to cover folks who are not typically perceived as SEP clients, including those who may be using prescription opioids.** Estimates show roughly 1% of Hawaiʻi youth under 18 and 3% of Hawaiʻi adults 18 and older have misused prescription pain killers. As the proportion of prescription-based fatal overdoses has increased both statewide and nationally, it becomes more important to train more people in harm reduction techniques, including use of naloxone. Hawaiʻi quickly leapt to the forefront of syringe exchange programs through legislation passed in 1989. Similarly, the state can make further strides by recognizing that overprescription of opioids leads to overdose risk. Policymakers should consider expanding the naloxone program at HHHRC to overcome provider and patient stigma related to naloxone use, an issue well documented in the literature.[70-71]
- **Policymakers should work to increase funding for SEP-related programs, such as wound care, in order to increase capacity and address the aging SEP clientele.** Currently, street outreach wound care is limited to Urban Honolulu twice weekly. Capacity to provide both street-based wound care and other street-based medical services could be supplemented through increased funding. This evaluation found the average age of SEP utilizers was 43, which did not greatly differ from the previous evaluation. As SEP utilizers age, other health problems may appear, making it more important to increase medical care capacity for PWID who access the SEP.
- **Increased outreach to youth for testing and prevention of HCV is needed, especially among sexual and/or gender minority youth.** During the program year, SEP test 60 participants for HCV, but half were over 40. Of the 17 who tested positive, two identified as men who have sex with men (MSM) and were in their early thirties. In 2018, all HHHRC HCV testing efforts identified 22 persons who had HCV, of whom 27% were 30 or under in age, and two were MSM. Regarding risk for injection drug use, data from Hawaiʻi show that lesbian, gay, and bisexual youth disproportionately

report having ever injected an illegal drug (8.9%) compared to their heterosexual counterparts (1.8%),[4] as do transgender youth when compared to their cisgender counterparts.[8] While HHHRC testing programs offer both HIV and HCV testing, increasing risk perception of HCV for PWID, especially sexual minority PWID, should be prioritized.

- **Expanded drug treatment programs referral efforts in the state are required, but drug treatment programs should offer additional public health services to those who do not access the SEP.** Previously, the SEP was funded to provide referrals to drug treatment programs, however, that funding ceased. Funds should be allocated to provide treatment referrals to those wishing to engage in drug treatment. In this evaluation, we found of those accessing the SEP, 44% reported heroin as their drug of choice, followed by 32% who preferred methamphetamines or ice. Data from the Substance Abuse and Mental Health Services Administration's (SAMHSA) Treatment Episode Data Set show that in 2017, while a combined 55 per 100,000 people entered heroin- or opioid-related treatment, nearly three times that amount—163 per 100,000—entered methamphetamine-related treatment.[72] Other SAMHSA data from the National Survey of Substance Abuse Treatment Services show that in 2017, of the 157 outpatient treatment sites that participated in data collection, only 3.6% of sites offered detoxification and 6.5% offered methadone maintenance, and only 5 of the 16 residential non-hospital sites that participated in the survey offered detoxification. Over 80% of treatment sites provide no pharmacotherapies as part of treatment. While 41% of sites provided HIV/AIDS education, counseling, or support, only 8.3% of sites offered HIV testing, only 8.9% of sites offered HCV screening, and only 5.4% offered STD testing.[73] Because SEP does not necessarily reach all of those using drugs or engaging in treatment, treatment sites must help close a critical gap in HIV/HCV testing and treatment by linking/referring clients to HHHRC testing services or offer these types of services on-site.
- **Replication of studies using interrupted time-series analysis may provide glimpse at how many HIV infections were averted in Hawaiʻi.** Other studies have estimated the number of HIV infections averted[51-52] and cost savings from SEP efforts.[51] Depending on the availability of data from the Hawaiʻi Department of Health, researchers should replicate peer reviewed methods used in other studies to estimate both the number of infections averted related to SEP and potential cost savings.
- **Drug checking pilot for SEP participants should be expanded.** In 2018, the SEP provided fentanyl test strips in a pilot project to help participants identify if their

supply is adulterated with fentanyl to decrease overdose risk and this program should be funded in its entirety.

Policy and institutional recommendations indirectly related to SEP

To further prevent injection drug use, policymakers must start by addressing structural violence, environmental contexts, and social determinants of drug use, including, but not limited to stigma and adverse childhood events. Paul Farmer and colleagues define structural violence as "a social arrangement that put individuals and populations in harm's way" (p. e449).[74] Structural issues embedded in the social, political, and economic arrangements of our society, and the resulting violence of harms and injury to people[74] are related to injection drug use. For indigenous communities, policies related to colonization and suppression of culture can result in historical, intergenerational, and complex trauma.[75]

The public health framework for disease prevention starts with "primary prevention," or stopping a disease before it starts. Two other levels of prevention exist: "secondary prevention" which is to intervene in the disease process before the disease clinically manifests, while "tertiary prevention" is the prevention of complications from the disease, or treatment.[76-77] While harm reduction initiatives such as SEP can help reduce injury and disease through needle exchange, more must be done to address the structural issues and resulting environmental contexts created by structural violence. Thus, when viewed broadly through the public health prevention and structural violence frameworks, SEP represents "tertiary treatment," that is, reducing the risk of HIV, HCV, or other infections due to syringe use. To affect the determinants of injection drug use and drug use generally, policy and institutional interventions at both the "primary prevention" and "secondary prevention" levels should be enacted. The following set of recommendations are specifically related to the social and political contexts that affect the work of SEP in Hawaiʻi at the primary and secondary levels of prevention.

- **Media and policymaker education to reduce stigmatization of PWID and people who are houseless in Hawaiʻi is needed.** Media frames can often stigmatize PWID78 and/or houseless people.[79] How the media frames and presents issues related to PWID and/or houselessness may cause readers or viewers to miscategorize structural/societal issues as ones related to individual responsibility.[80] Previous SEP reports show that enforcement actions or "sweeps" of people who are houseless led to loss of naloxone doses,53 which could potentially result in unnecessary overdose deaths. Language around houselessness and use of words like "sweep"—a term synonmous with "cleaning"—can negatively inform the discourse on those who are houseless.[78,81] Although studies are lacking on media framing of these issues in

Hawaiʻi, building the capacity of news media to understand how these two issues are intertwined can help the public better understand these issues, potentially reducing stigma against these two population groups. Policymakers or foundation funders should provide funds to increase capacity building efforts on these two fronts.

- **Housing First or other supportive housing interventions should be considered by policy makers as a means for treatment.** Houselessness is related to injection drug use. One study found for those who have stopped injecting, houselessness was related to relapse in injection, while houselessness over one month in length was related to injection drug use.[82] A different study found recent houselessness was significantly associated with dropping out of treatment.[83] Housing interventions, such as Housing First, are differentiated from "treatment first" programs which may require sobriety and detoxification prior to housing. Supportive housing programs are related to reduction in emergency room usage among those experiencing houselessness[84] and is related to reduced use of substances among those who are also diagnosed with severe mental illness.[85] The evidence is mixed on whether Housing First interventions can increase adherence to addiction treatment, with one article finding no difference in treatment adherence,[86] although another study found that enrollment in addiction treatment was associated with not being able to obtain stable housing which may imply instability.[87] However, Housing First definitions vary and may not include harm reduction principles.[88] Conflict between harm reduction and abstinence principles may lead to confusion about organizational policies for both staff and residents leading to conflict.[89] Providing differentiated services to meet the needs of clients with complex, intersecting issues is called for in the literature[90] and would be appropriate in Hawaiʻi's diverse environment.
- **Drug use is related to adverse childhood events, however, complex trauma, including historical and intergenerational trauma are related to adverse childhood events which would need to be remediated to avoid future adverse childhood events. In addition, environmental contexts that cause trauma for youth, specifically LGBTQ youth, should be addressed.** Researchers argue historical trauma such as adverse childhood experiences, poverty, and discrimination can be transmitted epigenetically, which can lead to negative parental care, including a furtherance of adverse childhood experiences.[91] A variety of adverse childhood events are associated with heroin and substance use in adulthood, though the type and severity of events differ by gender, and males were more likely to have post-traumatic stress disorder.[92] Age and access to prescriptions, plus physical and sexual abuse were related to earlier drug use.[93] Another study found childhood sexual abuse significantly increased the odds of injection drug use among youth.[94] Research

suggests that social stress, such as bullying or being threatened, can increase the likelihood that sexual minority youth inject drugs.[95] Other studies find LGBT youth misuse prescriptions at a younger age compared to their heterosexual identified counterparts, though this was not true for opioids or tranquilizers specifically.[93] Data also indicates more LGBTQ youth in Hawaiʻi inject compared to their heterosexual and/or cisgender counterparts.[4,8] Anecdotally, SEP staff report participants are becoming younger. Just over 20% of SEP participants exchanged in 2018 were 30 years old or younger, approximately 278 individuals. Policymakers should consider integrating trauma-informed care standards for health practitioners, including cultural humility;[96] consider further childhood abuse prevention programs; and, school-level interventions to prevent bullying in order to stave off drug use among youth, particularly LGBTQ youth.

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REFERENCES

1. North American Syringe Exchange Network, SEP Locations. North American Syringe Exchange Network, 2019. (Accessed 9/10/2019, https://www.nasen.org/map/).

2. US Centers for Disease Control and Prevention. High School YRBS, 2017 Results. (Accessed 9/10/2019, https://nccd.cdc.gov/youthonline/App/Default.aspx).

3. Hawaiʻi Health Data Warehouse, State of Hawaiʻi. Data updated 9 March 2018. (Accessed 9/10/2019, http://ibis.hhdw.org/ibisph-view/)

4. Holmes JR, Ching LK, Tomita KK, et al. Hawaiʻi Sexual and Gender Minority Health Report. Honolulu, HI: Hawaiʻi State Department of Health, Chronic Disease Prevention and Health Promotion Division; 2017. (Accessed 9/10/2019, https://health.hawaii.gov/surveillance/files/2017/05/HawaiiSexualandGenderMinorityHealthReport.pdf)

5. Al-Tayyib AA, Koester S, Riggs P. Prescription opioids prior to injection drug use: Comparisons and public health implications. *Addict Behav*. 2017;65:224-228.

6. Mars SG, Bourgois P, Karandinos G, Montero F, Ciccarone D. "Every 'never' I ever said came true": transitions from opioid pills to heroin injecting. *Int J Drug Policy*. 2014;25(2):257-266.

7. Suryaprasad AG, White JZ, Xu F, et al. Emerging epidemic of hepatitis C virus infections among young nonurban persons who inject drugs in the United States, 2006- 2012. *Clinical Infectious Diseases.* 2014;59:1411-9.

8. Ching LK, Holmes JR, Pham T, et al. Hawaiʻi Sexual and Gender Minority Health Report: A Focus on Transgender Youth. Hawaiʻi State Department of Health, Chronic Disease Prevention and Health Promotion Division; 2018. https://health.hawaii.gov/surveillance/files/2018/09/HawaiiSexualandGenderMinorityHealthReport2018.pdf.

9. Substance Abuse & Mental Health Services Administration, Substance Abuse & Mental Health Data Archive. Interactive NSDUH State Estimates. (Accessed 9/10/2019, https://pdas.samhsa.gov/saes/state).

10. National Institute on Drug Abuse. Overdose death rates. (Accessed 9/10/2019, https://www.drugabuse.gov/related-topics/trends-statistics/overdose-death-rates.)

11. US Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999-2017 on CDC WONDER Online Database, released

December, 2018. Data are from the Multiple Cause of Death Files, 1999-2017, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at http://wonder.cdc.gov/ucd-icd10.html on Sep 10, 2019 5:58:18 PM

12. Hawaiʻi State Department of Health. Drug Overdose Deaths among Hawaiʻi Residents, 1999- 2014. 2015. (Accessed 9/10/2019, https://health.hawaii.gov/injuryprevention/files/2015/11/Hawaii_Drug_Overdose_Death_Special_Emphasis_Report_2015.pdf)

13. The Hawaii Opioid Initiative: A Statewide Response. The Hawaii Opioid Initiative, December 1, 2017. (Accessed 9/10/2019, https://health.hawaii.gov/substance-abuse/files/2013/05/The-Hawaii-Opioid-Initiative.pdf).

14. Opioid Dashboard. The Hawaii Opioid Initiative, December 1, 2017. (Accessed 9/10/2019, https://hawaiiopioid.org/opioid-dashboard/).

15. Dowell D, Haegerich TM, Chou R. CDC Guideline for Prescribing Opioids for Chronic Pain - United States, 2016. *MMWR Recomm Rep*. 2016;65(1):1-49. (Accessed 9/10/2019, https://www.cdc.gov/mmwr/volumes/65/rr/rr6501e1.htm)

16. Hoffman, J. Johnson & Johnson ordered to pay $572 million in landmark opioid trail. New York Times. August 26, 2019. (Accessed 9/10/2019, https://www.nytimes.com/2019/08/26/health/oklahoma-opioids-johnson-and-johnson.html).

17. Heroin use skyrockets on Kauaʻi after prescription crackdown. Honolulu Star-Advertiser. March 12, 2018. https://www.staradvertiser.com/2018/03/12/breaking-news/heroin-use-skyrockets-on-kauai-after-prescription-crack-down/

18. Cicero TJ, Ellis MS, Kasper ZA. Increases in self-reported fentanyl use among a population entering drug treatment: The need for systematic surveillance of illicitly manufactured opioids. *Drug Alcohol Depend*. 2017;177:101-103.

19. US Centers for Disease Control and Prevention, November 2018. HIV Surveillance Report, 2017, 29. (Accessed 9/10/2019 at https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-report-2017-vol-29.pdf)

20. Hawaii State Department of Health, November 13, 2018. HIV/AIDS surveillance annual report: cases to December 31, 2017. (Accessed 9/10/2019,

https://health.hawaii.gov/harmreduction/files/2018/11/Hawaii_Surveillance_Rep_2017_final.pdf).

21. Hawaii Code R § 11-156, Exhibit B. http://health.hawaii.gov/opppd/files/2015/06/11-156.pdf

22. HIV Surveillance Report, Statistics Overview. US Centers for Disease Control and Prevention, 2017. (Accessed 4/26/2018, at https://www.cdc.gov/hiv/statistics/overview/index.html.)

23. Kerr T, Small W, Buchner C, et al. Syringe sharing and HIV incidence among injection drug users and increased access to sterile syringes. *Am J Public Health*. 2010;100(8):1449-1453.

24. Des Jarlais DC, Hagan H, Friedman SR, et al. Maintaining low HIV seroprevalence in populations of injecting drug users. *JAMA*. 1995;274:1226-31.

25. Bluthenthal RN, Anderson R, Flynn NM, Kral AH. Higher syringe coverage is associated with lower odds of HIV risk and does not increase unsafe syringe disposal among syringe exchange program clients. *Drug Alcohol Depend*. 2007;89(2-3):214-222.

26. Ksobiech K. A meta-analysis of needle sharing, lending, and borrowing behaviors of needle exchange program attenders. *AIDS Educ Prev*. 2003;15(3):257-268.

27. Ksobiech K. Beyond needle sharing: meta-analyses of social context risk behaviors of injection drug users attending needle exchange programs. *Subst Use Misuse*. 2006;41(10-12):1379-1394.

28. Huo D, Bailey SL, Hershow RC, Ouellet L. Drug use and HIV risk practices of secondary and primary needle exchange users. *AIDS Educ Prev*. 2005;17(2):170-184.

29. Des Jarlais DC, Perlis T, Arasteh K, et al. Reductions in hepatitis C virus and HIV infections among injecting drug users in New York City, 1990–2001. *AIDS*. 2005;19(Supp3):S20-S25.

30. Hagan H, Jarlais DC, Friedman SR, Purchase D, Alter MJ. Reduced risk of hepatitis B and hepatitis C among injection drug users in the Tacoma syringe exchange program. *Am J Public Health.* 1995;85:1531-7.

31. US Centers for Disease Control and Prevention. Surveillance for viral hepatitis – United States, 2017. (Accessed 9/11/2019, https://www.cdc.gov/hepatitis/statistics/2017surveillance/index.htm#hepatitisC).

32. Hawaiʻi Office of the Governor. DOH news release: high rates of Hep C found among Hawaii's kupuna. (Accessed 9/11/2019, https://governor.hawaii.gov/newsroom/latest-news/doh-news-release-high-rates-of-hep-c-found-among-hawaiis-kupuna/).

33. Hartnett KP, Jackson KA, Felsen C, et al. Bacterial and fungal infections in persons who inject drugs — western New York, 2017. *MMWR Morb Mortal Wkly Rep*. 2019;68(26):583-586.

34. Crowley JS, Millett GA. Preventing HIV and hepatitis infections among people who inject drugs: leveraging an Indiana outbreak response to break the impasse. *AIDS Behav*. 2017;21(4):968-972.

35. Strathdee SA, Beyrer C. Threading the needle — how to stop the HIV outbreak in rural Indiana. *N Engl J Med*. 2015;373(5):397-399.

36. Conrad C, Bradley HM, Broz D, et al. Community outbreak of HIV infection linked to injection drug use of oxymorphone — Indiana, 2015. *MMWR Morb Mortal Wkly Rep*. 2015;64(16):443-444.

37. Rudavsky S. An Indiana town recovering from 190 HIV cases. Indianapolis Star. April 8, 2016. http://www.indystar.com/story/news/2016/04/08/year-after-hiv-outbreak-austin-still-community-recovery/82133598/. Accessed March 19, 2017.

38. Zibbell JE, Iqbal K, Patel RC, et al. Increases in hepatitis C virus infection related to injection drug use among persons aged ≤30 years - Kentucky, Tennessee, Virginia, and West Virginia, 2006-2012. *MMWR Morb Mortal Wkly Rep*. 2015;64(17):453-458.

39. Harm Reduction Coalition. Rural Syringe Services Program, State Laws. 2019. (Accessed 9/11/2019, https://harmreduction.org/ruralsyringe/state-laws/).

40. Allen ST, Grieb SM, O'Rourke A, et al. Understanding the public health consequences of suspending a rural syringe services program: a qualitative study of the experiences of people who inject drugs. *Harm Reduct J*. 2019;16(1):33.

41. Hawaiʻi Health Data Warehouse Race-Ethnicity Documentation. State of Hawaiʻi, August 2011. at http://www.hhdw.org/wp-content/uploads/HHDW-Race-Ethnicity-Documentation-Report.pdf.)

42. Des Jarlais DC, Lenze SM, Lusk HM, Holmes JR. 2016 Syringe Exchange Program Evaluation Report. Honolulu, HI: The CHOW Project; 2017.

43. Gralapp S, Barile J, Lusk HM, Wang C, Seto J. Wound Care: A Need Identified by a Community of Interest in Hawaiʻi. Hawaiʻi-Pacific Evaluation Association. Hawaiʻi. 2016.

44. Darke S, Hall W. Heroin overdose: research and evidence-based intervention. *J Urban Health.* 2003;80:189-200.

45. Meacham M. Polydrug use and risk of HIV and overdose among people who inject drugs in San Diego, California, and Tijuana, Baja California, Mexico. 2015. https://escholarship.org/content/qt24h3k2m1/qt24h3k2m1.pdf?t=nzlocf. Accessed September 17, 2019.

46. Krinsky CS, Lathrop SL, Brown P, Nolte KB. Drugs, detention, and death: a study of the mortality of recently released prisoners. *Am J Forensic Med Pathol.* 2009;30:6-9.

47. Strang J, McCambridge J, Best D, et al. Loss of tolerance and overdose mortality after inpatient opiate detoxification: follow up study. *BMJ.* 2003;326:959-60.

48. Farnham PG, Holtgrave DR, Sansom SL, Hall HI. Medical costs averted by HIV prevention efforts in the United States, 1991–2006. *J Acquir Immune Defic Syndr*. 2010;54(5):565.

49. Bureau of Labor & Statistics. CPI Inflation Calculator. https://data.bls.gov/cgi-bin/cpicalc.pl?cost1=367%2C134&year1=200901&year2=201801. Accessed October 30, 2019.

50. US Centers for Disease Control & Prevention. HIV Cost-Effectiveness. Accessible at https://www.cdc.gov/hiv/programresources/guidance/costeffectiveness/index.html

51. Ruiz MS, O'Rourke A, Allen ST. Impact evaluation of a policy intervention for HIV prevention in Washington, DC. *AIDS Behav*. 2016;20(1):22-28.

52. Ruiz MS, O'Rourke A, Allen ST, et al. Using interrupted time series analysis to measure the impact of legalized syringe exchange on HIV diagnoses in Baltimore and Philadelphia. *J Acquir Immune Defic Syndr*. 2019;82:S148-S154.

53. Holmes JR, Lusk HM, Maxera L, Des Jarlais DC. 2017 Syringe Exchange Program Annual Report. Honolulu: The CHOW Project, Hawaiʻi Health & Harm Reduction Center. 2018.

54. Centers for Disease Control and Prevention. HIV Surveillance Report, Statistics Overview. https://www.cdc.gov/hiv/statistics/overview/index.html

55. Salek TP, Katz AR, Lenze SM, Lusk HM, Li D, Des Jarlais DC. Seroprevalence of HCV and HIV infection among clients of the nation's longest-standing statewide syringe exchange program: A cross-sectional study of Community Health Outreach Work to Prevent AIDS (CHOW). *Int J Drug Policy*. 2017;48:34-43.

56. Nelson PK, Mathers BM, Cowie B, et al. Global epidemiology of hepatitis B and hepatitis C in people who inject drugs: results of systematic reviews. *Lancet*. 2011;378:571-83.

57. Substance Abuse and Mental Health Services Administration, Substance Abuse and Mental Health Data Archive, 2016-2017 National Survey on Drug Use and Health. https://www.samhsa.gov/data/sites/default/files/cbhsq-reports/NSDUHsaeTotal2017A/NSDUHsaeTotals2017.pdf. Accessed 9/24/2019.

58. Hawaiʻi Public Radio. Hawaiʻi's New Ice Age: Crystal Meth in the Islands, 2016. https://www.hawaiipublicradio.org/term/hawai-new-ice-age-crystal-meth-islands#stream/0

59. Robles, F. Meth, the forgotten killer, is back. And it's everywhere. New York Times. February 13, 2018. https://www.nytimes.com/2018/02/13/us/meth-crystal-drug.html. Accessed 9/24/2019.

60. Shukla, RK. *Methamphetamine: a love story.* Oakland, Calif: University of California Press; 2016.

61. Brecht M-L, Herbeck D. Methamphetamine use and violent behavior: user perceptions and predictors. *J Drug Issues*. 2013;43(4):468-482.

62. Darke S, Torok M, Kaye S, Ross J, McKetin R. Comparative rates of violent crime among regular methamphetamine and opioid users: offending and victimization. *Addiction*. 2010;105(5):916-919.

63. Hamilton AB, Goeders NE. Violence perpetrated by women who use methamphetamine. *J Subst Use*. 2010;15(5):313-329.

64. Shelton KH, Taylor PJ, Bonner A, van den Bree M. Risk factors for homelessness: evidence from a population-based study. *Psychiatric Services*. 2009;60(4):465-472.

65. Tsai J, Rosenheck RA. Risk factors for homelessness among US veterans. *Epidemiol Rev*. 2015;37:177-195.

66. McQuistion HL, Gorroochurn P, Hsu E, Caton CLM. Risk factors associated with recurrent homelessness after a first homeless episode. *Community Ment Health J*. 2014;50(5):505-513.

67. Hawaiʻi Opioid Initiative, Opioid Dashboard, 2018. https://hawaiiopioid.org/opioid-dashboard/. Accessed 9/24/2019.

68. Hawaiʻi Opioid Initiative, Annual number of hospital-treated nonfatal opioid poisonings among Hawaii residents, by type of opioid, 2010-2017. https://opioidsdash.revacomm.net/pdfs/slide_2.pdf. Accessed 9/24/2019.

69. Hawaiʻi Opioid Initiative, Annual number of fatal opioid poisonings among Hawaii residents, by type of opioid, 1999-2017. https://opioidsdash.revacomm.net/pdfs/slide_1.pdf. Accessed 9/24/2019.

70. Green TC, Case P, Fiske H, et al. Perpetuating stigma or reducing risk? Perspectives from naloxone consumers and pharmacists on pharmacy-based naloxone in 2 states. *J Am Pharm Assoc*. 2017;57:S19-S27.

71. Olsen A, Lawton B, Dwyer R, et al. Why aren't Australian pharmacists supplying naloxone? Findings from a qualitative study. *Int J Drug Policy*. 2019;69:46-52.

72. Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. *Treatment Episode Data Set (TEDS): 2017. Admissions to and Discharges from Publicly-Funded Substance Use Treatment.* Rockville, MD: Substance Abuse and Mental Health Services Administration, 2019. https://wwwdasis.samhsa.gov/dasis2/teds_pubs/TEDS-2017-R.pdf

73. Substance Use and Mental Health Services Administration. *2017 State Profile – Hawaii, National Survey of Substance Abuse Treatment Services (N-SSATS).* Rockville, MD: Substance Use and Mental Health Services Administration. https://wwwdasis.samhsa.gov/webt/state_data/HI17.pdf

74. Farmer PE, Nizeye B, Stulac S, Keshavjee S. Structural violence and clinical medicine. *PLoS Med*. 2006;3(10):e449.

75. O'Neill L, Fraser T, Kitchenham A, McDonald V. Hidden burdens: a review of intergenerational, historical and complex trauma, implications for indigenous families. *J Child Adolesc Trauma*. 2018;11(2):173-186.

76. Dekker G, Sibai B. Primary, secondary, and tertiary prevention of pre-eclampsia. *Lancet*. 2001;357(9251):209-215.

77. Shamansky SL, Clausen CL. Levels of prevention: examination of the concept. *Nurs Outlook*. 1980;28(2):104-108.

78. Stupplebeen DA. People who inject drugs and HIV crisis in Pence's Indiana: a media analysis using two policymaking theories. *Int J Drug Policy*. 2018;57:79-85.

79. Truong SV. "Please Do Not Feed the Homeless:" The Role of Stereotyping and Media Framing on the Criminalization of Homelessness. 2012. https://escholarship.org/content/qt9jv4v5nw/qt9jv4v5nw.pdf?t=mhfnue. Accessed September 24, 2019.

80. Schneider B. Sourcing homelessness: how journalists use sources to frame homelessness. *Journalism*. 2012;13(1):71-86.

81. Hemrajani A. The Dharma of Bums: Identity, Neoliberalism, and Biomedicine in the Practice of Treating Homelessness in Honolulu. Saethre E, ed. December 2016. https://scholarspace.manoa.hawaii.edu/bitstream/10125/51533/2016-12-ma-hemrajani.pdf.

82. Linton SL, Celentano DD, Kirk GD, Mehta SH. The longitudinal association between homelessness, injection drug use, and injection-related risk behavior among persons with a history of injection drug use in Baltimore, MD. *Drug Alcohol Depend*. 2013;132(3):457-465.

83. Lo A, Kerr T, Hayashi K, et al. Factors associated with methadone maintenance therapy discontinuation among people who inject drugs. *J Subst Abuse Treat*. 2018;94:41-46.

84. Miller-Archie SA, Lim S, Walters S, Singh T. Impact of supportive housing on substance use healthcare utilization and treatment among homeless persons who are active substance users. *Ann Epidemiol*. 2018;28(9):656-657.

85. Padgett DK, Stanhope V, Henwood BF, Stefancic A. Substance use outcomes among homeless clients with serious mental illness: comparing Housing First with Treatment First programs. *Community Ment Health J*. 2011;47(2):227-232.

86. Parpouchi M, Moniruzzaman A, Rezansoff SN, Russolillo A, Somers JM. The effect of Housing First on adherence to methadone maintenance treatment. *Int J Drug Policy*. 2018;56:73-80.

87. Palepu A, Marshall BDL, Lai C, Wood E, Kerr T. Addiction treatment and stable housing among a cohort of injection drug users. *PLoS One*. 2010;5(7):e11697.

88. Watson DP, Shuman V, Kowalsky J, Golembiewski E, Brown M. Housing First and harm reduction: a rapid review and document analysis of the US and Canadian open-access literature. *Harm Reduct J*. 2017;14(1):30.

89. Pauly B, Wallace B, Barber K. Turning a blind eye: implementation of harm reduction in a transitional programme setting. *Drugs (Abingdon Engl)*. 2018;25(1):21-30.

90. Littlewood R, Gilman M, McLoughlin S. Housing for people with substance use disorders: one size does not fit all tenants—assessment of 16 housing services and suggestions for improvement based on real world experience. *Community Ment Health J*. 2019;55(2):331-335.

91. Conching AKS, Thayer Z. Biological pathways for historical trauma to affect health: a conceptual model focusing on epigenetic modifications. *Soc Sci Med*. 2019;230:74-82.

92. Shand FL, Degenhardt L, Slade T, Nelson EC. Sex differences amongst dependent heroin users: histories, clinical characteristics and predictors of other substance dependence. *Addict Behav*. 2011;36(1-2):27-36.

93. Kecojevic A, Wong CF, Schrager SM, et al. Initiation into prescription drug misuse: differences between lesbian, gay, bisexual, transgender (LGBT) and heterosexual high-risk young adults in Los Angeles and New York. *Addict Behav*. 2012;37(11):1289-1293.

94. Hadland SE, Werb D, Kerr T, et al. Childhood sexual abuse and risk for initiating injection drug use: a prospective cohort study. *Prev Med*. 2012;55(5):500-504.

95. Lowry R, Johns MM, Robin LE, Kann LK. Social stress and substance use disparities by sexual orientation among high school students. *Am J Prev Med*. 2017;53(4):547-558.

96. Rides At The Door M, Trautman A. Considerations for implementing culturally grounded trauma-informed child welfare services: recommendations for working with American Indian/Alaska Native populations. *J Public Child Welf*. 2019;13(3):368-378.