

**Assessment of the health and experiences of people who inject drugs in Maricopa County,
Arizona**

Maricopa County Department of Public Health

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In loving memory of P. R. P.
(Assessment Field Site Staff, 1980 – 2019)
“Life is so important and good..”

Introduction

People who inject drugs (PWID) are at risk for numerous injection-related injuries and diseases including human immunodeficiency virus (HIV), hepatitis C virus (HCV), abscesses, vascular damage, endocarditis, sepsis, bone and joint infections, thrombosis, and emboli.¹⁻³ Estimating the size of this vulnerable and hard-to-reach population is challenging due to the illicit nature of the behavior and the fact that administrative datasets such as hospital discharge and death certificate data do not include specific codes for injection drug use. Similarly, understanding the health needs of this population is difficult because many are disconnected from health and social service systems.

This assessment provides an overview of the demographics, health conditions, and other characteristics of PWID in Maricopa County (MC) and attempts to estimate the total size of the population. This is the first assessment of its kind in MC, a diverse jurisdiction in central Arizona that includes more than 4 million people. To identify an assessment method that is scientifically sound that could also be effectively implemented in our local context, we conducted formative research through a literature review and feasibility study in collaboration with stakeholders. This report outlines the findings from our formative research and the methods and results of our 2019 assessment.

Formative research

Literature Review

To identify and evaluate potential methods for estimating the number of PWID in Maricopa County, we conducted a systematic review of peer-reviewed and “grey” literature. We conducted a systematic search that included five peer-reviewed literature databases, several sources of grey literature, and relevant conference abstracts. We identified a total of 29 unique studies that estimated the prevalence or incidence of PWID in a county or equivalent geography and reported on both estimate(s) and methods. We abstracted data into a standard database detailing the study location, date, data sources, and analytic approach. Since our objective was to both quantify the population size and assess the health of PWID, we focused on approaches that lent themselves to both population estimation and primary data collection.

The most commonly reported methods in our review were capture-recapture (15 studies) and multiplier methods (11 studies). Other identified methods included a population-based survey, literature reviews, wisdom-of-the-crowd estimates, and direct estimation from respondent-driven sampling survey designs. Sixteen studies employed some form of primary data collection. Recruitment for these surveys was most frequently done through respondent-driven sampling or community partners such as syringe exchanges.

Respondent driven sampling (RDS) was most frequently used in assessments that quantified population size and collected primary data. RDS is a peer-recruitment method used frequently to survey the health of hard-to-reach populations where a few initial “seeds” are given a small number of coupons that they can use to recruit acquaintances in the population of interest. Coupons are marked with a unique identification number that can be used to track who recruited whom. Each participant is interviewed and reports their network degree, and participants receive incentives for participation and recruitment. This process generates a sample of the population of

interest in the absence of a sampling frame and is particularly useful when the population of interest is small and/or disconnected relative to the general population. Estimation of population prevalence for various indicators of interest can be done using a mathematical model that weights the sample to compensate for the fact that the sample was collected in a non-random way. While analysis of data collected through RDS requires statistical methods to account for the complex sampling design, several widely accessible tools exist to assist with analysis.¹

Methods to directly estimate total population size from the characteristics of the RDS network have been introduced in recent years.^{8,9} These methods take advantage of the recruitment chain and network size information, leveraging the assumption that those with larger networks tend to be sampled earlier in the recruitment process. An additional advantage of RDS over other methods for estimating population size (such as capture-recapture) is the ability to incorporate primary data collection, in the form of a survey or interview, into the process. Most RDS studies we reviewed did this, focusing on themes including:

- General demographics
- HIV and hepatitis testing history
- History of drug use including current use, past use, and initial age of use
- Sexual health and behaviors
- History of drug treatment
- Perceptions on risk and treatment
- Service access (particularly if the service is a dataset being used by a multiplier)
- Incarceration history
- Network size

Feasibility Study

After identifying RDS as the optimal method for participant sampling and recruitment, we developed a preliminary assessment proposal including survey methods and a questionnaire. Using these materials as a starting point, we conducted in-depth interviews with seven categories of stakeholders: people who inject drugs (current or former); family members of people who inject drugs; organizations that provide services to people who inject drugs; advocacy groups; law enforcement; local public health practitioners; and academicians and subject matter experts. Stakeholders were initially contacted by email to describe the proposed project and were invited to discuss the project. Interviews were approximately one hour in length and most were conducted in person at the Maricopa County Department of Public Health (MCDPH) Office of Epidemiology (n=12), but other options were available for convenience (i.e., by phone, n=0; at locations selected by the interviewee, n=2). Interviewees were provided (1) a draft summary of the proposed methods and logistics for estimating the number of people who inject drugs and (2) a draft of the proposed survey. We used a standard set of core questions plus supplemental questions tailored to each stakeholder's subject matter expertise.

¹ Volz, E.; Wejnert, C.; Cameron, C.; Spiller, M.; Barash, V.; Degani, I.; and Heckathorn, D.D. 2012. Respondent-Driven Sampling Analysis Tool (RDSAT) Version 7.1. Ithaca, NY: Cornell University

Overall, stakeholders were positive about the project, and all had previously recognized the need for data regarding the experience of PWID in MC. Several themes emerged across the interviews. All centered around ensuring the process was set up to maximize engagement and avoid stigma:

- Questions should not be stigmatizing, and phrases such as sexual partner or questions referring to buying drugs and stealing may be offensive or off-putting. These subjects may be dealt with, but gently, as these and many other questions may be perceived as stigmatizing.
- The mental health, housing and medical portions of the survey may need to have expanded options to capture variety in responses. Some of these questions may be open-ended. Questions about identity should also be more open-ended.
- Clear and simplified language should be used. For drug terms, this includes street terms regarding drug usage. This also includes clarifying in the reverse; that participants may know medical terminology rather than slang. It is better to include more terms rather than fewer and have more options rather than less on the drugs listed and the drug terminology.

Assessment Methods

Participant recruitment and eligibility

Eligible participants were recruited using respondent-driven sampling (RDS). RDS is a form of snowball sampling where a small number of “seeds” (5–8 persons) are located, enrolled, and asked to recruit up to five of their contacts who inject drugs. The individuals recruited by the initial seeds then recruit eligible individuals within their networks, and this recruitment chain continues until the preferred sample size is reached. Participants recruit their peers by giving them a coupon that provides information on how to participate and complete the survey. Eligible individuals are aged 18+ years, have injected drugs for non-medical purposes at least once in the last 30 days, and live primarily in Maricopa County. The Arizona Department of Health Services Human Subjects Review Board reviewed the protocol and determined this assessment to be limited risk to participants. All participants provided informed consent verbally prior to beginning the survey.

Data collection

Field sites

Once recruited, individuals brought their coupons to a field site to complete a questionnaire about their health behaviors and experiences. Field sites were operational 7 days per week at sites around Maricopa County and co-located at venues where PWID regularly go such as substance use treatment facilities. Sites offered both day time and evening hours depending on the day of the week and were staffed by at least three individuals during all hours of operation. All sites included semi-private areas for participant consent and assessment completion. The first field site was opened for accepting coupon recipients on Tuesday, 2/12/19. The first seed arrived on Sunday, 2/17/19.

Recruitment and Incentive Information

Participants had to present a valid coupon to take the survey, which included an ID number that could be linked to the ID number of the person who recruited them. No identifiable information was collected from participants, however we identified potential duplicate responses using a unique code consisting of the first two letters of the participant's mother's first name, the day the participant was born, the first two letters of the participant's first name, the month the participant was born, and the first two letters of the city the participant was born in. This code along with the coupon number, gift card information, and coupons given out was stored in the RDS Coupon Manager Software². Participants received a \$20 gift card incentive for completing the survey and \$5 gift card for each successful recruit. All coupon and incentive information was tracked in a paper logbook as backup.

Questionnaire

Participants completed the questionnaire using Qualtrics software installed on a tablet. The questionnaire was self-guided but field staff were nearby to answer questions. Question topics included substance use patterns, medical history, substance use and other treatment, demographic and economic factors, experience of trauma, mental health, and injection practices. The complete questionnaire was reviewed by participants in the feasibility study including service providers, health professionals, and people who inject drugs. Field staff ensured the coupon number was recorded in Qualtrics to link survey and recruitment information.

Data Management and Analysis

Survey responses and coupon management data were exported from Qualtrics and RDS Coupon Manager, respectively. The two data sources were joined by the respondent's coupon ID number using SAS Enterprise (Version 7.15) and reconciled against the paper log book. Surveys that were duplicates (identified based on the participant's unique ID), that took only a few minutes, or that used an invalid coupon ID number were removed from analysis.

Some participants did not report a network size. Because network size is necessary to calculate population frequency estimates, we imputed mean network size for these individuals based on the sample distribution, with a minimum imputed network size for any individual set as the number of their recruits. For other variables, missing data were coded as a missing indicator.

Recruitment Diagnostics

We used the RDS Analyst program to map the recruitment network and calculate diagnostic information: network size by wave, number of recruits by wave, recruits per seed, and recruits per subject. The source population for the network information was all individuals who took the survey using a valid coupon, to maintain the integrity of the recruitment chains.

We calculated recruitment homophily for the sample using RDS Analyst. Recruitment homophily measures the tendency for individuals to recruit others who are similar to them with respect to a particular characteristic. Values close to one suggest low levels of homophily. We calculated this measure for key demographic variables including age, sex, and ethnicity as well as needle sharing practices.

² Available at: <http://www.respondentdrivensampling.org/>

Descriptive Analysis

We calculated crude frequencies and weighted and unweighted population prevalence (percentages) for key variables. Population prevalence estimates were limited to responses from eligible participants. Participants were eligible if they reported they were at least 18 years old, had injected drugs for a non-medical purpose in the last 30 days, and primarily lived in Maricopa County, Arizona. In order to participate, eligible participants also had to confirm that they had not taken the survey before and consent to participate. To calculate weighted percentages and 95% confidence intervals we used Gile's Successive Sampling estimator in RDS Analyst. We used 29,716 as the estimated population size throughout our analysis.³

Assessment Results

Recruitment and Eligibility

A total of 765 responses were submitted through Qualtrics, and 725 entries registered in RDS Coupon Manager. These two data sources represented 720 individuals who had a valid coupon, 672 of whom were eligible and included in analysis.

The recruitment network is presented in Figure 1. Of the six seeds initially identified, three failed to yield any recruits. Four additional seeds were identified over the course of recruitment. Nearly all recruits (n=693) could be traced back to one seed (Figure 1 and Table 1). There were a total of 22 waves of recruitment, waves 11-14 included the largest numbers of participants (Figure 2).

Survey Findings

Sample and population summary findings for key survey questions presented in Tables 2-16. Selected findings are highlighted in the narrative below.

Demographic, Social, and Economic factors

Demographics of eligible respondents and corresponding population prevalence estimates are presented in Table 2. PWID in MC are more likely to be male than female. Most of both men (84.6%) and women (69.9%) identify as straight. Unemployment, housing instability, and justice involvement are common in this population: Nearly half (48.5%) report unemployment and 37.7% report incarceration within the last month. An estimated 68% of PWID report homelessness at some point in their life, nearly half (47.9%) in the past year (Table 3). The majority of respondents came from the Central region of the county, a pattern which is relatively consistent with the population distribution overall.

Health Conditions and Treatment

Table 4 presents the prevalence of and treatment for selected health conditions. Abscesses were the most common health condition, reported by an estimated 27.8% of the population. Other conditions including staph infection, pneumonia, and cellulitis occurred in at least 10% of the population. Nearly 20% of PWID are estimated to be infected with hepatitis C virus, and less

³ Tempalski B, Pouget ER, Cleland CM, Brady JE, Cooper HL, Hall HI, Lansky A, West BS, Friedman SR. Trends in the population prevalence of people who inject drugs in US metropolitan areas 1992-2007. PLoS One. 2013 Jun 5;8(6):e64789.

than half of those infected reported treatment. Trauma and mental health concerns were also prevalent, with more than half the population reporting four or more adverse childhood experiences and 41% reporting a diagnosis of depression (Table 7). Additionally, 42% thought seriously about taking own life, and among those about 69% had attempted.

Drug Use, Overdose, and Naloxone

Heroin and methamphetamines were the drugs most frequently injected, with over half the population reporting use in the last month (Table 8). While 32.1% of PWID have witnessed an opioid overdose in the last year, only half reported knowing how to use naloxone (Table 10). Community organizations and peers were the most frequently reported sources of education about how to use naloxone.

Treatment and Syringe Access

About a quarter of the population had substance abuse treatment within the past year (Table 11). Nearly a third reported that they wanted treatment but were unable, with the most frequent reason reported being individuals not being ready to stop using. Less than two-thirds of participants (63.4%) accessed new, sterile needles in the past month (Table 12), while 35.3% reported never injecting with a previously used needle (Table 13). Forty-four percent reported never giving, lending, or renting one of their needles to someone else.

Discussion

Limitations

Our assessment faced challenges with recruitment that could limit the generalizability of inferences. The majority of participants were recruited from a single seed. However, participants were successfully recruited across 22 waves, suggesting that we were able to reach relatively deep into a network of PWID. Additionally, we observed low levels of homophily for sex, ethnicity, and needle sharing, with values close to 1 (data not shown). This suggests that the tendency of the sample was not necessarily to recruit others like them with respect to these characteristics. Most participants came from the central part of the county, in and around downtown Phoenix. While this is not inconsistent with the population distribution of Maricopa County it does suggest that our data might not be representative of the county geographically.

There was a large amount of missing data for many questions. We used a missing indicator in an effort to produce the most conservative estimates. For indicators such as the prevalence of disease or an inability to access treatment, we expect the true prevalence to be at least as high as the estimates we report, if not higher.

In addition to assessing and describing the health of PWID, the intention of this assessment was also to produce an updated estimate of population size using methods that leverage the respondent-driven sampling network information. However, we faced substantial challenges to the integrity of the RDS method including having to remove a number of ineligible individuals from the dataset and the fact that most participants came from the recruitment chain of a single seed. Therefore, we determined that a population size estimation using methods that leverage the

RDS network, such as the Successive sampling-population size estimation (SS-PSE) estimator, was not appropriate for this assessment. We instead used the previously published population size estimate of 29,716 in our analysis.

Conclusion

This assessment provides important and actionable insight into the health and experiences of PWID in Maricopa County. For example, while many infections reported by PWID were relatively well treated, reports of treatment for hepatitis C were relatively low. We observed high levels of housing instability, incarceration, and unemployment. These and other findings can provide guidance to public health agencies, healthcare, and social service providers on how to most effectively engage PWID.

Figure 1. Recruitment network for respondent-driven sampling, people who inject drugs, Maricopa County, 2019

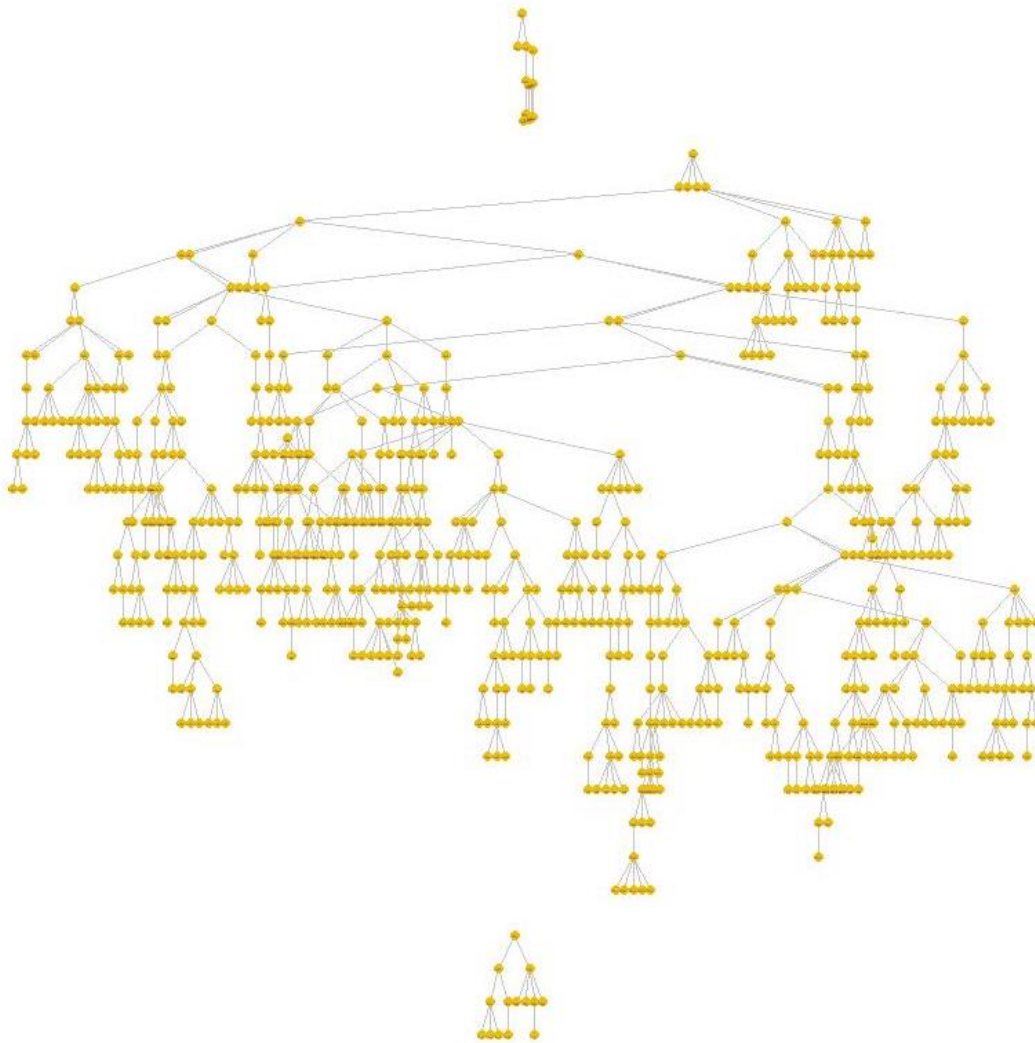


Table 1. Number of recruits per seed, respondent-driven sample of people who inject drugs, Maricopa County, 2019

| Seed Number | Number of recruits |
|-------------|--------------------|
| 19001 | 3 |
| 19002 | 1 |
| 19006 | 693 |
| 19247 | 14 |
| 20403 | 2 |
| 20453 | 2 |
| 20467 | 5 |

Note: Three additional seeds (19003, 19004, 19005) did not yield any participants

Figure 2a. Number of participants per wave, respondent-driven sample of people who inject drugs, Maricopa County, 2019 (Left: Full Sample, N=725; Right: Eligible participants, N=672)

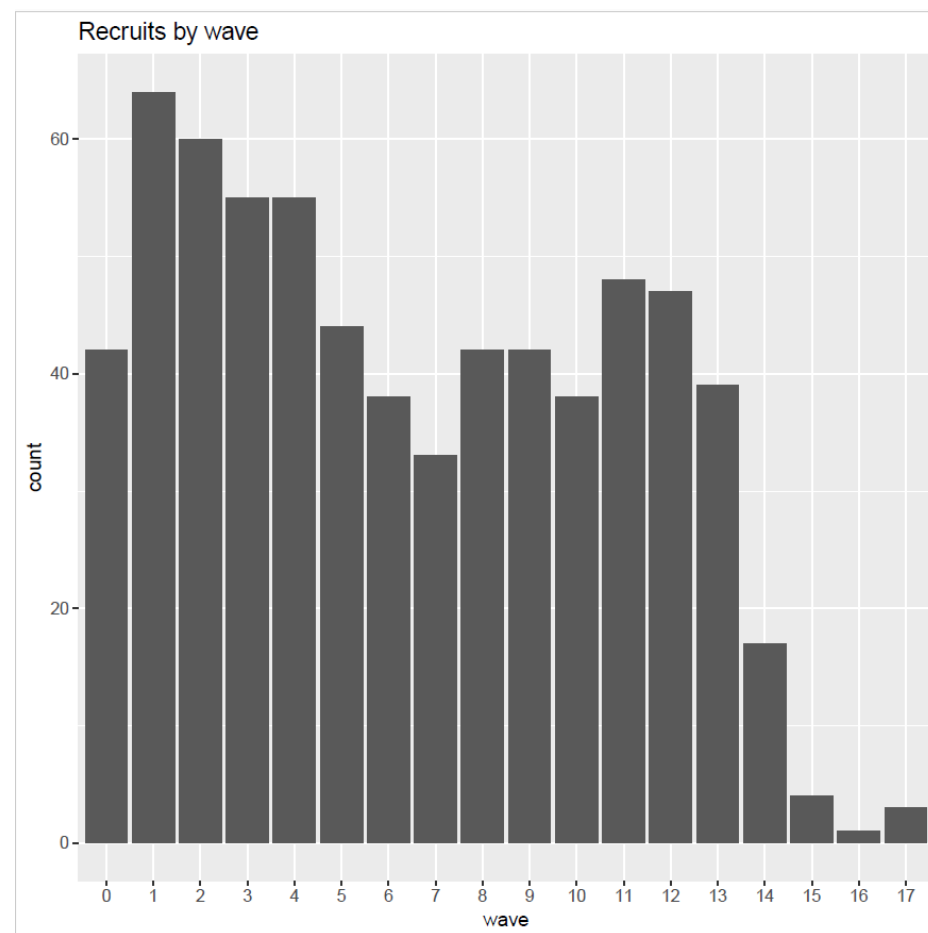
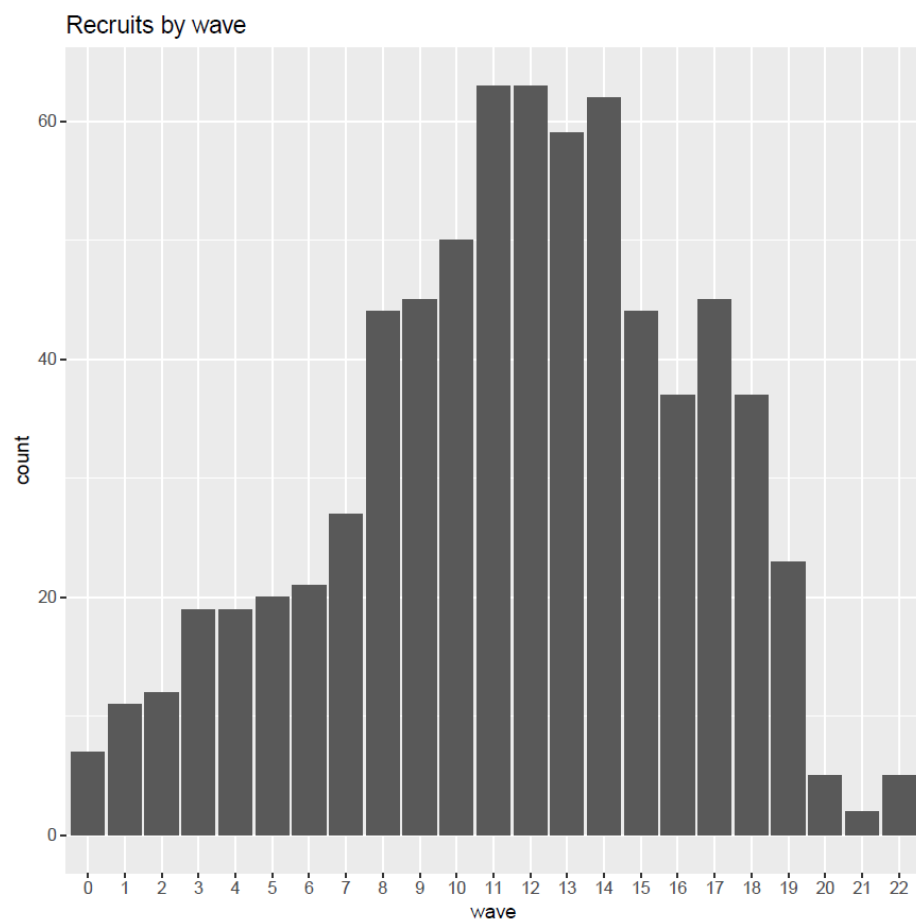


Table 2. Sample and population demographics, respondent-driven sample of people who inject drugs, Maricopa County, 2019

| | Survey respondents, eligible, unweighted | Estimates for all people who inject drugs in Maricopa County |
|---|---|--|
| Total | 672 | |
| | <i>n (%)</i> | <i>% (95% CI)</i> |
| Age groups | | |
| 18 – 25 | 55 (8.2) | 9.3 (4.8, 13.9) |
| 26 – 35 | 208 (31.0) | 32.0 (26.1, 37.8) |
| 36 – 45 | 167 (24.9) | 24.7 (19.4, 13.1) |
| 46 – 55 | 162 (24.1) | 22.4 (17.4, 27.3) |
| 56 – 65 | 74 (11.0) | 11.0 (7.1, 14.8) |
| > 65 | 6 (0.9) | 0.6 (0.1, 1.1) |
| Gender | | |
| Female | 222 (33.0) | 36.8 (30.6, 42.9) |
| Male | 372 (55.4) | 62.8 (56.6, 68.9) |
| Intersex / ambiguous | <5 N/A | NA |
| Transgender | | |
| Male to Female | 10 (1.5) | 2.8 (0.2, 5.8) |
| Female to Male | 10 (1.5) | 1.3 (0.3, 2.2) |
| Gender nonconforming | <5 N/A | NA |
| Sexual identity, women | | |
| Straight women | 147 (66.2) | 69.9 (61.2, 78.5) |
| Bisexual women | 51 (23.0) | 18.3 (12.0, 24.5) |
| Lesbian women | 15 (6.8) | 8.0 (2.2, 13.9) |
| Other identity (e.g., pansexual), women | <5 N/A | NA |
| Sexual identity, men | | |
| Straight men | 332 (89.3) | 84.6 (77.1, 92.0) |
| Bisexual | 18 (4.8) | 5.5 (1.2, 10.0) |
| Gay men | 9 (2.4) | 3.1 (0.4, 6.5) |
| Other identity (e.g., pansexual), men | 5 (1.3) | 2.0 (0.3, 4.3) |
| Race, Hispanic, Latino/a, Spanish origin | | |
| American Indian or Alaska Native | 12 (9.0) | 11.2 (1.9, 20.3) |
| Asian | <5 N/A | NA |
| Black or African American | 9 (6.7) | 8.3 (2.5, 18.9) |
| Native Hawaiian or Other Pacific Islander | 7 (5.2) | NA |
| White or Caucasian | 46 (34.3) | 36.7 (23.7, 49.9) |
| Other race | 47 (35.1) | 28.5 (15.7, 41.3) |
| Race, Non-Hispanic, Latino/a, Spanish origin | | |
| American Indian or Alaska Native | 42 (9.5) | 10.3 (5.7, 14.9) |
| Asian | <5 N/A | NA |
| Black or African American | 120 (27.2) | 31.8 (24.4, 39.1) |
| Native Hawaiian or Other Pacific Islander | <5 N/A | 1.0 (0.2, 2.3) |
| White or Caucasian | 275 (62.4) | 56.3 (49.2, 63.6) |
| Other race | 16 (3.6) | 3.1 (1.3, 5.0) |
| Region of Residence | | |
| Central | 396 (58.9) | 54.0 (46.9, 61.0) |
| West | 19 (2.8) | 2.4 (1.1, 3.7) |
| North | 39 (5.8) | 5.5 (3.1, 8.0) |
| South | 89 (13.2) | 14.0 (8.4, 19.6) |

Table 3. Sample and population education, occupation, housing, justice-involvement, respondent-driven sample of people who inject drugs, Maricopa County, 2019

| | Survey respondents, eligible, unweighted | Estimates for all people who inject drugs in Maricopa County |
|---|---|--|
| Total | 672 | |
| | <i>n (%)</i> | <i>% (95% CI)</i> |
| Highest grade or level of school | | |
| Never attended/Kindergarten Only | <5 NA | 3.2 (1.1, 5.3) |
| 1st-8th | 22 (3.3) | 17.2 (12, 22.2) |
| 9th-11th | 110 (16.3) | 32.6 (27.1, 38.2) |
| 12 th grade or GED | 213 (31.7) | 19.5 (15.3, 23.8) |
| Some college, no degree | 153 (22.8) | 5.8 (3.5, 8.1) |
| Associate's degree | 41 (6.1) | 3.7 (1.7, 5.8) |
| Technical degree | 25 (3.7) | 2.2 (1.1, 3.2) |
| Bachelor's degree | 20 (3.0) | 3.0 (0.1, 5.8) |
| Any post-graduate studies | 13 (1.9) | 3.2 (1.1, 5.3) |
| Employment status | | |
| Employed, full-time | 56 (8.3) | 9.5 (5.6, 13.3) |
| Employed, part-time | 47 (7.0) | 6.9 (3.6, 10.2) |
| A homemaker | 18 (2.7) | 3.3 (1.2, 5.4) |
| A full-time student | 15 (2.2) | 2.0 (0.6, 3.4) |
| Retired | 19 (2.8) | 2.9 (1.4, 4.3) |
| Unable to work for health reasons | 72 (10.7) | 10.5 (7.2, 13.9) |
| Unemployed | 338 (50.3) | 48.5 (42.4, 54.4) |
| Other | 21 (3.1) | 2.4 (1.0, 3.8) |
| Veteran of the US Armed Forces | 47 (7.0) | 6.2 (4.1, 8.3) |
| Homelessness | | |
| Ever | 483 (71.9) | 68.0 (62.6, 73.5) |
| Past 12 months | 360 (53.6) | 47.9 (41.8, 53.9) |
| Current | 314 (46.7) | 42.4 (36.1, 48.8) |
| Jail, at least one night, past month | 267 (39.7) | 37.7 (32.2, 43.2) |

Table 4. Sample and population physical health, respondent-driven sample of people who inject drugs, Maricopa County, 2019

| | Survey respondents, eligible, unweighted | | Estimates for all people who inject drugs in Maricopa County | |
|---|---|-------------------------------|--|---------------------------|
| Total | 672 | | | |
| Self-reported health conditions | Condition | Treatment received | Condition | Treatment received |
| | <i>n (%)</i> | <i>n (%)</i> | <i>% (95%CI)</i> | <i>% (95%CI)</i> |
| Abscesses | 218 (32.4) | 188 (86.2) | 27.8 (22.7, 33.1) | 85.4 (78.6, 91.0) |
| Hepatitis C virus (HCV) | 163 (24.3) | 67 (41.1) | 19.5 (14.3, 24.8) | 41.9 (28.1, 55.9) |
| Cellulitis | 129 (19.2) | 101 (78.3) | 14.7 (10.6, 18.9) | 80.2 (69.9, 89.9) |
| Pneumonia | 118 (17.6) | 98 (83.1) | 13.7 (9.3, 18.1) | 80.3 (65.3, 95.2) |
| Staph infection or MRSA | 115 (17.1) | 99 (86.1) | 15.2 (10.6, 20.0) | 90.7 (84.3, 97.0) |
| Chlamydia | 72 (10.7) | 65 (90.3) | 8.3 (5.6, 10.9) | 88.5 (75.7, 101.1) |
| Blood infection or sepsis | 63 (9.4) | 39 (61.9) | 6.2 (4.2, 8.2) | 56.8 (41.2, 73.1) |
| Gonorrhea | 57 (8.5) | 46 (80.7) | 8.0 (5.2, 10.7) | 77.9 (64.6, 91.4) |
| Blood clots | 50 (7.4) | 27 (54.0) | 6.0 (3.4, 8.6) | 52.2 (32.4, 72.2) |
| Genital warts or HPV | 33 (4.9) | 21 (63.6) | 4.0 (1.9, 6.0) | 70.6 (50.9, 91.2) |
| Tuberculosis (TB) | 32 (4.8) | 21 (65.6) | 3.8 (2.1, 5.4) | 67.4 (44.7, 90.7) |
| Endocarditis | 31 (4.6) | 17 (54.8) | 2.3 (1.2, 3.4) | 54.1 (32.4, 75.1) |
| Syphilis | 28 (4.2) | 22 (78.6) | 3.0 (1.4, 4.6) | 71.4 (48.5, 95.6) |
| Cirrhosis of the liver | 25 (3.7) | 10 (40.0) | 2.4 (1.2, 3.7) | 40.6 (18.4, 63.4) |
| Hepatitis B virus (HBV) | 21 (3.1) | 8 (38.1) | 2.2 (0.8, 3.6) | 30.0 (6.5, 53.9) |
| Tetanus, botulism, or necrotizing fasciitis | 19 (2.8) | 12 (63.2) | 1.8 (0.08, 2.8) | 52.0 (26.9, 75.9) |
| Genital herpes | 18 (2.7) | 9 (50.0) | 2.0 (0.9, 3.0) | 45.7 (17.8, 75.0) |
| HIV or AIDS | 10 (1.5) | 8 (80.0) | 2.5 (0.4, 4.6) | 95.3 (82.9, 107.2) |
| Liver cancer | 8 (1.2) | <5 N/A | 27.8 (22.7, 33.1) | NA |

Table 5. Sample and population Hepatitis C and HIV infection, respondent-driven sample of people who inject drugs, Maricopa County, 2019

| | Survey respondents, eligible, unweighted | Estimates for all people who inject drugs in Maricopa County |
|--|---|--|
| Total | 672 | |
| | <i>n (%)</i> | <i>% (95%CI)</i> |
| HIV | | |
| Ever tested | 421 (62.7) | 61.2 (55.2, 67.1) |
| Self-reported HIV or AIDS | 10 (1.5) | 2.5 (0.3, 4.7) |
| First diagnosis within past year | <5 N/A | NA |
| Received treatment | 8 (80.0) | 95.3 (84.5, 106.3) |
| Never tested for HIV, reasons | 251 | |
| Don't have the time | 25 (13.7) | 15.1 (7.3, 23.0) |
| Low risk for HIV infection | 19 (10.4) | 6.2 (2.4, 9.9) |
| Afraid | 14 (7.7) | 3.2 (1.1, 5.3) |
| Did not want the test results reported to insurance provider | 10 (5.5) | 2.7 (0.4, 4.9) |
| Too expensive | 7 (3.8) | 3.2 (0.5, 5.9) |
| Other | 26 (14.2) | 8.9 (4.3, 13.4) |
| Hepatitis C virus (HCV) | | |
| Ever tested | 436 (64.9) | 61.6 (55.8, 67.5) |
| Self-reported HCV | 163 (24.3) | 19.5 (14.8, 24.3) |
| First diagnosis within past year | 37 (22.7) | 18.0 (10.1, 25.9) |
| Received treatment | 67 (41.1) | 42.1 (28.6, 55.1) |

Table 6. Sample and population mental health status and trauma, respondent-driven sample of people who inject drugs, Maricopa County, 2019

| | Survey respondents, eligible, unweighted | Estimates for all people who inject drugs in Maricopa County |
|---|---|--|
| Total | 672 | |
| | <i>n (%)</i> | <i>% (95%CI)</i> |
| Self-reported mental health conditions | | |
| Depression, bipolar disorder, or anxiety disorder | 310 (46.1) | 41.0 (34.4, 47.7) |
| Treatment received | 241 (77.7) | 80.6 (73.7, 87.2) |
| Thought seriously about taking own life | | |
| Attempted to commit suicide | 195 (68.9) | 26.7 (21.7, 31.7) |
| Adverse Childhood Experiences Score | | |
| 0 | 122 (18.15) | 20.2 (15.6, 24.8) |
| 1 | 52 (7.74) | 7.8 (4.9, 10.7) |
| 2 | 55 (8.18) | 9.24 (6.0, 12.5) |
| 3 | 59 (7.78) | 9.8 (5.9, 13.7) |
| 4 or more | 384 (57.14) | 53.0 (46.7, 59.4) |

Table 7. Sample and population access to healthcare, respondent-driven sample of people who inject drugs, Maricopa County, 2019

| | Survey respondents, eligible, unweighted | Estimates for all people who inject drugs in Maricopa County |
|--|---|--|
| Total | 672 | |
| | <i>n (%)</i> | <i>% (95%CI)</i> |
| Seek health advice from a primary source | 354 (52.7) | 51.9 (43.6, 60.1) |
| Emergency room at a hospital | 182 (51.4) | 45.5 (36.7, 54.2) |
| Urgent care facility | 141 (39.8) | 38.2 (29.7, 46.6) |
| Clinic or health center | 116 (32.8) | 26.5 (19.0, 33.9) |
| Doctor's office or HMO | 104 (29.4) | 12.1 (7.6, 16.8) |
| Community organization that is not a healthcare facility | 49 (13.8) | 6.5 (3.4, 9.7) |
| Some other place | 29 (8.2) | |
| Last routine checkup | | 55.4 (49.7, 60.9) |
| Within the past year | 334 (49.7) | 16.6 (12.4, 20.8) |
| More than 1 year, less than 2 | 122 (18.2) | 9.7 (6.3, 13.15) |
| More than 2 years, less than 5 | 69 (10.3) | 5.4 (3.2, 7.6) |
| 5 or more years | 47 (7.0) | 45.6 (39.6, 51.7) |
| No health care coverage in the past year | 303 (45.1) | 51.9 (43.6, 60.1) |
| Delays in getting needed medical care, past year, reasons | | |
| <i>Have not delayed care</i> | 191 (28.6) | 45.6 (39.6, 51.7) |
| Didn't have transportation | 160 (23.9) | 21.3 (16.3, 26.4) |
| Treated poorly by medical staff in past because of my drug use | 147 (22.0) | 16.8 (12.3, 21.4) |
| Couldn't get an appointment soon enough | 114 (17.0) | 16.5 (12, 20.8) |
| Embarrassed to seek medical care | 110 (16.4) | 12.7 (8.9, 16.6) |
| Once there, had to wait too long to see the doctor | 96 (14.4) | 14.1 (10.2, 18.0) |
| Couldn't get through on the telephone | 75 (11.2) | 11.9 (7.6, 16.2) |
| Clinic/doctor's office wasn't open when I could get there | 30 (4.5) | 3.4 (1.9, 5.4) |

Table 8. Sample and population history of drug use, respondent-driven sample of people who inject drugs, Maricopa County, 2019

| | Survey respondents, eligible, unweighted | Estimates for all people who inject drugs in Maricopa County |
|--|---|--|
| Total | 672 | |
| | <i>n (%)</i> | <i>% (95%CI)</i> |
| Age at first injection | | |
| < 15 years | 37 (5.5) | 4.7 (1.4, 8.0) |
| 15 – 18 years | 103 (15.3) | 13.5 (9.7, 17.3) |
| 19 – 21 years | 110 (16.4) | 18.1 (12.9, 23.4) |
| 22 – 25 years | 114 (17.0) | 18.8 (14.0, 23.5) |
| 26 – 30 years | 96 (14.3) | 13.7 (9.9, 17.5) |
| 31 – 35 years | 80 (11.9) | 12.2 (8.5, 15.9) |
| > 35 years | 88 (13.1) | 12.3 (8.9, 15.6) |
| First drug injected | | |
| Heroin | 268 (39.9) | 39.0 (32.8, 45.2) |
| Amphetamine or methamphetamine | 182 (27.1) | 29.2 (23.5, 35.0) |
| Cocaine | 113 (16.8) | 14.8 (11.1, 18.5) |
| Any opioid other than heroin | 23 (3.4) | 4.6 (1.4, 7.8) |
| A mixture (or polysubstance) | 11 (1.6) | 1.1 (0.26, 1.95) |
| Benzodiazepine | <5 NA | NA |
| Prescription stimulants | <5 NA | NA |
| Other | 16 (2.4) | 3.0 (1.4, 4.7) |
| Time between first drug use and first injection | | |
| < 1 year | 157 (23.4) | 21.2 (16.9, 25.4) |
| 1 – 2 years | 122 (18.2) | 19.2 (14.5, 23.8) |
| 3 – 5 years | 136 (20.2) | 23.1 (17.8, 28.4) |
| 6 – 10 years | 84 (12.5) | 12.7 (8.2, 17.4) |
| > 10 years | 102 (15.2) | 13 (8.8, 17.3) |
| Drug of choice | | |
| Heroin | 169 (25.2) | 19.2 (14.6, 23.6) |
| Amphetamine or methamphetamine | 62 (9.2) | 7.7 (5.0, 10.5) |
| Cocaine | 14 (2.1) | 1.3 (0.4, 2.2) |
| Any opioid other than heroin | 10 (1.5) | 1.5 (0.4, 0.6) |
| A mixture (or polysubstance) | 7 (1.0) | 0.6 (0.0, 1.2) |
| Prescription stimulants | <5 NA | NA |
| Drugs injected in the last 30 days | | |
| Heroin | 395 (58.8) | 51.4 (44.9, 58.0) |
| Amphetamine or methamphetamine | 366 (54.5) | 50.5 (44.0, 57.0) |
| Cocaine | 115 (17.1) | 16.1 (12.2, 19.9) |
| Any opioid other than heroin | 99 (14.7) | 12.8 (8.9, 16.6) |
| A mixture (or polysubstance) | 33 (4.9) | 4.7 (1.7, 7.7) |
| Benzodiazepine | 24 (3.6) | 3.6 (1.7, 5.6) |
| Prescription stimulants | 17 (2.5) | 1.7 (0.7, 2.7) |
| Other | 8 (1.2) | 1.5 (0.3, 2.7) |
| Most recent drug injection | | |
| Today | 283 (42.1) | 34.1 (27.8, 40.2) |
| Yesterday | 93 (13.8) | 15.9 (11.0, 20.8) |
| 2 – 7 days ago | 122 (18.2) | 20.5 (15.8, 25.2) |
| 8 – 30 days ago | 81 (12.1) | 14.2 (9.9, 18.6) |
| More than 30 days ago | 21 (3.1) | 4.6 (2.4, 6.8) |

Table 10. Sample and population experience of overdose, respondent-driven sample of people who inject drugs, Maricopa County, 2019

| | Survey respondents, eligible, unweighted | Estimates for all people who inject drugs in Maricopa County |
|-------------------------------|---|--|
| Total | 672 | |
| | <i>n (%)</i> | <i>% (95%CI)</i> |
| Opioid overdose, past year | 94 (14.0) | 12.6 (8.4, 16.9) |
| Received naloxone, past year | 98 (14.6) | 10.6 (7.3, 13.9) |
| Stimulant overdose, past year | 56 (8.3) | 7.4 (4.0, 10.7) |

Table 11. Sample and population awareness, knowledge, and skills, respondent-driven sample of people who inject drugs, Maricopa County, 2019

| | Survey respondents, eligible, unweighted | Estimates for all people who inject drugs in Maricopa County |
|---|---|--|
| Total | 672 | |
| | <i>n (%)</i> | <i>% (95%CI)</i> |
| Knowledge about how to use naloxone / Narcan | 377 (56.1) | 50.3 (44.2, 56.5) |
| <i>Educated by:</i> | | |
| On the streets | 113 (30.0) | 26.4 (19.3, 33.6) |
| A community-based organization | 84 (22.3) | 27.2 (19.3, 35.0) |
| Peers (people who use opioids) | 58 (15.4) | 13.3 (8.8, 17.9) |
| Family or friends | 47 (12.5) | 10.3 (5.9, 14.5) |
| A doctor, clinic, or community health agency | 19 (5.0) | 5.3 (2.4, 8.2) |
| While in jail or prison | 15 (4.0) | 3.7 (1.2, 6.2) |
| Internet (I looked for it myself) | 12 (3.2) | 4.4 (0.5, 9.3) |
| Other | 23 (6.1) | 8.2 (2.7, 13.6) |
| Knowledge about how to access a naloxone / Narcan kit | 352 (52.4) | 48.9 (42.8, 55.0) |
| Currently have a naloxone / Narcan kit | 283 (42.1) | 38.5 (32.3, 44.6) |
| Witnessed someone who had an opioid overdose, past year | 291 (43.5) | 32.1 (24.0, 37.2) |
| Treated someone by administering naloxone, past year | 112 (16.7) | 9.0 (5.6, 12.4) |

Table 12. Sample and population access to substance use treatment, respondent-driven sample of people who inject drugs, Maricopa County, 2019

| | Survey respondents, eligible, unweighted | Estimates for all people who inject drugs in Maricopa County |
|--|---|--|
| Total | 672 | |
| <i>n (%)</i> | <i>% (95%CI)</i> | <i>n (%)</i> |
| Received treatment for drug use, ever | 299 (44.5) | 40.6 (34.4, 47.0) |
| Treatment, past year | 171 (25.5) | 23.2 (17.5, 29.1) |
| Tried to get treatment but unable to access for some reason, past year | 211 (31.4) | 31.9 (25.9, 37.9) |
| Not ready to stop using | 196 (92.9) | 39.6 (27.6, 51.5) |
| Did not know where to go to get treatment | 71 (33.6) | 15.7 (8.3, 22.7) |
| Didn't find a program that offered the type of treatment or counseling wanted | 67 (31.8) | 20.8 (10.0, 31.7) |
| No openings in the programs | 61 (28.9) | 22.3 (11.2, 33.6) |
| Health care coverage, but it didn't cover treatment or didn't cover the full cost | 57 (27.0) | 20.2 (8.7, 31.5) |
| No transportation to a program, the programs were too far away, or the hours were not convenient | 54 (25.6) | 22.5 (11.5, 33.7) |
| No health care coverage and couldn't afford the cost | 49 (23.2) | 14.6 (5.5, 23.9) |
| Concerned that getting treatment or counseling might cause neighbors or community to have a negative opinion | 44 (20.9) | 10.1 (4.8, 15.6) |
| Concerned that getting treatment or counseling might have a negative effect on job | 38 (18.0) | 9.8 (1.6, 17.9) |
| Other | 50 (23.7) | 11.6 (2.8, 20.5) |

Table 13. Sample and population access to clean needles, respondent-driven sample of people who inject drugs, Maricopa County, 2019

| | Survey respondents, eligible, unweighted | Estimates for all people who inject drugs in Maricopa County |
|--|---|--|
| Total | 672 | |
| | <i>n (%)</i> | <i>% (95%CI)</i> |
| Used a new sterile needle, last 30 days | | |
| Always | 206 (30.7) | 36.6 (30.7, 42.5) |
| Most of the time | 180 (26.8) | 13.4 (9.3, 17.4) |
| About half the time | 104 (15.5) | 22.6 (17.7, 27.5) |
| Rarely | 56 (8.3) | 7.4 (4.5, 10.4) |
| Never | 33 (4.9) | 5.0 (2.6, 7.4) |
| Easily obtain new, sterile needles and syringes when needed, last 30 days | 425 (63.2) | 63.4 (57.8, 69.0) |
| Place for new, sterile needles and syringes, last 30 days | | |
| Needle / syringe access program | 307 (45.7) | 39.9 (33.7, 46.2) |
| Bought from a pharmacy or drug store | 202 (30.1) | 29.8 (24.2, 35.4) |
| Friend, relative, or sex partner | 190 (28.3) | 27.1 (21.4, 32.8) |
| Other drug injector | 113 (16.8) | 13.0 (9.9, 16.1) |
| Drug dealer, needle dealer, or off the street | 111 (16.5) | 11.2 (8.5, 13.9) |
| Doctor's office, clinic, or hospital | 33 (4.9) | 4.7 (2.5, 6.7) |
| Stolen from pharmacy, shop, or hospital | 29 (4.3) | 3.0 (1.5, 4.4) |
| Other | 36 (5.4) | 11.2 (8.5, 13.9) |
| Used services of a needle / syringe access program, ever | 355 (52.8) | 43.7 (37.6, 49.8) |
| What did you usually do with the needle or syringe after injection, last 30 days | | |
| Kept it to re-use it | 202 (30.1) | 25.8 (20.5, 31.1) |
| Threw it away in a solid plastic or container, sealed it, and threw the container in the trash | 183 (27.2) | 29.1 (23.2, 35.0) |
| Threw it away in a trash bin or on the street | 163 (24.3) | 26.1 (21.0, 31.3) |
| Put it in a medical waste disposal container (e.g. a "red box") | 103 (15.3) | 12.7 (9.2, 16.2) |
| Took it to a needle or syringe exchange program | 71 (10.6) | 9.4 (6.2, 12.6) |
| Gave or sold it to someone else to use it | 44 (6.6) | 4.8 (2.8, 6.8) |
| Other | 36 (5.4) | 5.9 (2.6, 9.2) |

Table 14. Sample and population needle use, sharing, and disposal, respondent-driven sample of people who inject drugs, Maricopa County, 2019

| | Survey respondents, eligible, unweighted | Estimates for all people who inject drugs in Maricopa County | |
|---|---|--|--------------|
| Total | 672 | | |
| | <i>n (%)</i> | <i>% (95%CI)</i> | |
| Injected with a previously used needles or syringes that were used by someone else | | | |
| Yes, within the last 30 days | 327 (48.7) | 42.2 | (36.2, 48.2) |
| Yes, but not in the last 30 days | 63 (9.4) | 12.1 | (7.5, 16.7) |
| Never | 203 (30.2) | 35.3 | (29.3, 41.4) |
| Number of times needle used to inject before disposing | | | |
| 1 time only | 194 (28.9) | 35.8 | (29.6, 42.0) |
| About 2 to 5 times | 285 (42.4) | 38.3 | (32.0, 44.0) |
| 6 – 25 times | 54 (8.0) | 6.4 | (3.8, 8.9) |
| 26 – 50 times | 15 (2.2) | 1.5 | (0.5, 2.5) |
| More than 50 times | 15 (2.2) | 1.6 | (0.6, 2.6) |
| Used a spoon, cooker, filter, cotton, acid, lemon juice, or rinse water already used by someone else | | | |
| Yes, within the last 30 days | 388 (57.7) | 51.1 | (44.8, 57.4) |
| Yes, but not in the last 30 days | 49 (7.3) | 9.5 | (5.6, 13.3) |
| Never | 155 (23.1) | 26.4 | (20.8, 32.1) |
| Gave, lent, rented, or sold a needle or syringe you had used to someone else (including partner) | | | |
| Yes, within the last 30 days | 285 (42.4) | 34.9 | (29.6, 40.2) |
| Yes, but not in the last 30 days | 48 (7.1) | 8.9 | (4.9, 12.9) |
| Never | 258 (38.4) | 44.5 | (38.8, 50.2) |
| Cleaned needles or syringes that were used by someone else before re-using them | | | |
| Yes, within the last 30 days | 8 (1.2) | 1.0 | (0.3, 1.7) |
| Yes, but not in the last 30 days | 392 (58.3) | 53.1 | (46.9, 59.4) |
| Never | 181 (26.9) | 29.7 | (24.1, 35.2) |
| Usual cleaning methods for needles and syringes (among those who have cleaned them) | | | |
| Bleach | 258 (64.5) | 30.0 | (24.6, 35.2) |
| Water (not boiling) | 141 (35.3) | 16.9 | (12.6, 21.2) |
| Rubbing alcohol | 125 (31.3) | 18.9 | (13.6, 24.1) |
| Boiling water | 101 (25.3) | 11.5 | (7.7, 15.3) |
| Hydrogen peroxide | 77 (19.3) | 8.3 | (5.6, 11.1) |
| Soap or detergent | 27 (6.8) | 3.2 | (1.7, 4.8) |
| Iodine | 15 (3.8) | 2.4 | (0.2, 4.9) |
| Other | 13 (3.3) | 2.6 | (0.2, 5.5) |

Table 15. Sample and population children and pregnancy, respondent-driven sample of people who inject drugs, Maricopa County, 2019

| | Survey respondents, eligible, unweighted | Estimates for all people who inject drugs in Maricopa County |
|---|---|--|
| Total | 672 | |
| | <i>n (%)</i> | <i>% (95%CI)</i> |
| Children under the age of 18 years old | 255 (38.0) | 38.0 (32.0, 44.1) |
| Currently pregnant or have been pregnant in the last 12 months (among women) | 19 (6.3) | 8.6 (1.8, 15.2) |
| Prenatal care among those who are pregnant | 9 (47.4) | 61.3 (25.0, 95.3) |

Table 16. Sample and population living situation, respondent-driven sample of people who inject drugs, Maricopa County, 2019

| | Survey respondents, eligible, unweighted | Estimates for all people who inject drugs in Maricopa County |
|---|---|--|
| Total | 672 | |
| | <i>n (%)</i> | <i>% (95%CI)</i> |
| Living situation, past 12 months | | |
| Lived alone | 150 (22.3) | 23.0 (17.4, 28.8) |
| Partner | 153 (22.8) | 22.4 (17.4, 27.4) |
| Children | 25 (3.7) | 2.3 (1.2, 3.4) |
| Parents | 51 (7.6) | 7.9 (4.9, 10.8) |
| Relatives | 41 (6.1) | 5.6 (3.0, 8.2) |
| Other adults | 187 (27.8) | 24.5 (19.3, 29.7) |
| Other | 33 (4.9) | 4.2 (2.4, 6.1) |