

Estimating Individual Syringe Coverage at Syringe Services Programs

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Statement of Purpose

The aim of this document is to assist syringe services programs (SSPs) in collecting and analyzing data on individual syringe coverage for their participants. Adequate syringe coverage may limit syringe sharing and reuse and is an essential strategy to prevent viral and bacterial infections. Health departments and researchers who work with SSPs could use this information to meaningfully engage with harm reduction staff to survey people who inject drugs and assess resource gaps. The presented measures are intended for people who *currently* inject drugs.

Overview of Syringe Coverage

Studies show that syringe coverage rarely meets people's needs in the US, especially in rural areas.¹ Inadequate syringe coverage has been associated with syringe sharing, syringe reuse, and hepatitis C (HCV) transmission.² Syringe reuse is associated with painful injections, skin and soft tissue infections, endocarditis, and additional harmful health outcomes.³

What is syringe coverage?

Syringe coverage is an indicator that can help SSPs and other stakeholders estimate if people who inject drugs have enough syringes to reduce risks of infections and vein damage. Syringe coverage can be calculated for large populations of people who inject drugs, for the participants of one program, or for sub-groups of participants of a program (e.g. participants who are unhoused).

Syringe coverage is measured and reported in many ways. Some syringe coverage indicators focus on a population of people who inject drugs and use *population level* measures, like the number of estimated people who inject drugs in a jurisdiction and the number of syringes distributed by all programs in the jurisdiction. Other syringe coverage indicators focus on the individual. *Individual level* syringe coverage is estimated using questions asked directly of people who inject drugs. SSPs may use data on individual syringe coverage to analyze if their participants receive enough syringes to use a new syringe each time they inject.

¹ Allen et al. 2021; Tempalski et al. 2008

² Allen et al. 2021; Bluthenthal, Anderson, et al. 2007; Bryant, Paquette, and Wilson 2012; Iversen et al. 2012; Noroozi et al. 2015; O'Keefe et al. 2016

³ Dahlman et al. 2015; Dwyer et al. 2009; Harris and Rhodes 2012; Hope et al. 2008; 2010; Lloyd-Smith et al. 2008; Remis, Bruneau, and Hankins 1998; Salmon et al. 2009; Topp et al. 2008

While population syringe coverage is summarized below, the focus of this guidance is on individual syringe coverage. Individual level syringe coverage, as opposed to population level, is a more attainable measure for SSPs, and the results are often more actionable. To be completed according to good practices, population level syringe coverage requires large amounts of data that are difficult to collect and analyze as well as someone who is experienced in estimating populations of people who engage in activities that have been criminalized. While population syringe coverage has uses, there are limitations, outlined in the next section, which make it less useful for single programs.

Population Level Syringe Coverage

Research on population level estimates of syringe coverage has shown that few people who inject drugs receive enough syringes to use a new syringe for each injection.⁴ While not outlined here, population level syringe coverage has been estimated for several countries⁵ and cities.⁶

Population syringe coverage is often reported as the number of syringes obtained per person who injects drugs per year, which is calculated using the following formula:

$$\frac{\text{Total number of syringes distributed in the jurisdiction in one year}}{\text{Estimated number of PWID in the jurisdiction}}$$

UNAIDS considers provision of up to 100 syringes per person who injects drugs per year as “low” coverage, from 100 up to 200 syringes per year as “medium” coverage, and 200 or more syringes per year as “high” coverage.⁷ The WHO recommends countries provide 300 syringes per person who injects drugs per year by 2030.⁸ Even countries with “high” coverage are unlikely to meet people’s needs unless they distribute over 200 syringes per person who injects drugs per year because on average, people who inject drugs require more than one new syringe every day. In one Australian study, 550 syringes per year were needed if people were to use a new syringe for every injection.⁹ With the association between increased injecting and fentanyl and stimulant use,¹⁰ all of these calculations are likely a drastic underestimation, which is why an understanding of local drug use is important in estimating population level syringe coverage.

⁴ Aceijas et al. 2007; Jacka et al. 2020

⁵ Aceijas et al. 2007; Jacka et al. 2020; Kwon et al. 2019; O’Keefe, Aitken, and Dietze 2020

⁶ Remis, Bruneau, and Hankins 1998; Tempalski et al. 2008

⁷ UNAIDS 2019

⁸ WHO 2016

⁹ Kwon et al. 2019

¹⁰ Allen et al. 2021; Bryant, Paquette, and Wilson 2012; O’Keefe, Scott, et al. 2017

In order to calculate population syringe coverage, there must be an accurate estimate of the number of people who inject drugs in an area. Estimating the population of people who inject drugs is possible, but is resource intensive and “inherently uncertain.”¹¹ Organizations interested in population syringe coverage can refer to more detailed information on estimating the size of people who inject drugs populations, including guidance created by the Supporting Harm Reduction Programs (SHaRP) Team: [Population Size Estimation of People Who Inject Drugs: An Overview of Methodologies](#). However, as this guidance highlights, these estimates are often unavailable and can be difficult to calculate. According to a 2018 estimate, there are 3,694,500 people who inject drugs in the US, but this estimate would be difficult to apply to smaller jurisdictions.¹² Estimates that are available may be based on years old data that are inconsistent with current trends or may be based on numbers of people who inject drugs who are institutionally involved with the legal system or substance use disorder treatment, which does not capture large populations of people who inject drugs.

Population syringe coverage is one measure to analyze if a jurisdiction’s harm reduction programs are meeting their participants’ needs, but population coverage cannot capture inequalities between local or regional subgroups of people who inject drugs. These variations are important for programs to consider because some groups of people who inject drugs require different types of outreach and have different levels of need.¹³ Even in areas with high population coverage, there are gaps in coverage for individuals.¹⁴

Individual Level Syringe Coverage

Individual syringe coverage is often reported as the number of new syringes provided to a person who injects drugs divided by the estimated number of injections or attempted injections during a specified time period.¹⁵ Individual syringe coverage may reveal if an SSP meets participants’ needs for syringes. If participant needs are unmet, syringe coverage measures may be used to advocate for more syringe funding or for needs-based as opposed to one-for-one or capped syringe distribution. One-for-one distribution is where participants receive one new syringe for every used syringe they return. CDC recommended needs-based syringe distribution is associated with increased participant engagement with programs, decreased syringe reuse

¹¹ Hickman et al. 2004; Mathers et al. 2010

¹² Bradley et al. 2022

¹³ Iversen et al. 2012; O’Keefe, Scott, et al. 2017; O’Keefe et al. 2019; O’Keefe, Aitken, and Dietze 2020

¹⁴ O’Keefe et al. 2018

¹⁵ Burrows 2006; Sharma, Burrows, and Bluthenthal 2007

and sharing, and decreased bacterial infection and virus transmission.¹⁶ Available data shows that greater individual syringe coverage is not associated with improper syringe disposal.¹⁷

Individual syringe coverage may be used to examine equity between and within programs if questions about demographics and structural vulnerabilities (e.g. housing status) are included with syringe coverage assessments. Some populations have been shown to have lower syringe coverage in a local area, including young people, people who use stimulants, people who are unhoused, and Black and Latine/x participants.¹⁸

There are some limitations to measuring individual syringe coverage because it relies on self-reported data. Self-reported data may be subject to bias,¹⁹ but self-reported data from people who inject drugs has also shown to be reliable and valid.²⁰ Individual syringe coverage is an estimate because of these biases and because people's lives and drug use fluctuate through time.

¹⁶ Bluthenthal, Anderson, et al. 2007; Bluthenthal, Ridgeway, et al. 2007; Centers for Disease Control and Prevention 2020; Javed et al. 2020; Kral et al. 2004; McCormack et al. 2016; Turner-Bicknell 2021

¹⁷ Bluthenthal, Anderson, et al. 2007

¹⁸ Bryant, Paquette, and Wilson 2012; Heller et al. 2009; O'Keefe, Scott, et al. 2017

¹⁹ Latkin, Vlahov, and Anthony 1993; Latkin and Vlahov 1998

²⁰ Darke 1998; Dowling-Guyer et al. 1994; Needle et al. 1995; Weatherby et al. 1994

Estimating Individual Syringe Coverage

Local Context

Local context may affect individual syringe coverage and the target a program has for syringe coverage. Policies outside of SSP control, such as restrictions requiring one-for-one exchange of syringes, caps on the number of syringes that can be exchanged, police confiscation of syringes, and policing in and around SSP locations, may affect the ability of people who inject drugs to access enough syringes.²¹ Widespread stimulant and fentanyl injection may mean that participants need more syringes to use a new syringe for each injection, while transitions to smoking might reduce the demand for syringes.²²

Due to these local differences, it is crucial to pilot test all new questions and measures locally with SSP participants and staff to make sure questions are understandable, make sense for people's lives, and are easily answered.

Using Informal Qualitative Data

Although it will not provide a number for syringe coverage, SSPs may use informal qualitative data to measure participants' syringe coverage. Des Jarlais et al. (2021) suggest asking participants if they and their friends have enough syringes so they do not have to share or reuse. If more than 10% of participants say they or their peers do not have enough syringes, then programs may want to explore ways to increase syringe supply. More information about informal qualitative data may be found in SHaRP's guidance document, [Leveraging Informal Qualitative Data Collection and Use at Syringe Services Programs](#).

Basic Syringe Coverage Indicator

Most syringe coverage indicators are calculated using multiple variables (otherwise known as data points). The basic variables for most individual syringe coverage indicators come from Bluthenthal et al. and include frequency of SSP visits, syringe acquisition/secondary syringe distribution, and injection frequency, which are all measured in separate questions. For SSP visits, the participant is asked how many times they came to the SSP during a specific timeframe. The syringe acquisition/secondary syringe distribution question asks how many syringes people received for themselves after their last SSP visit. (This is different from how many syringes someone received at the last visit because people often pick up syringes for

²¹ Bluthenthal, Ridgeway, et al. 2007; Bluthenthal et al. 2004; Davis et al. 2005; Heimer et al. 2002; Sherman et al. 2015

²² Kral et al. 2021

other people.) For injection frequency, people are asked how often they inject during a specific timeframe. A basic syringe coverage indicator is calculated with the following formula²³:

$$\frac{\text{Number of visits to the SSP in the last 30 days} \times \text{Number of syringes retained from the last SSP visit}}{\text{Number of injections in the last 30 days}} \times 100$$

Individual syringe coverage is well-studied, but it is an estimate. For example, the number of syringes people retain from each SSP visit may change through a 30-day time period. See [Appendix 1: Basic Syringe Coverage Measure Formula and Questions](#) for specifically worded questions.

Learn about [Data Collection](#) and [Basic Individual Syringe Coverage Analysis](#) in sections below.

Additional Syringe Coverage Variables

There are two additional variables that may be added to the basic syringe coverage formula, depending on local context. If large numbers of participants regularly access syringes through a source outside of an SSP, programs may want to ask them from where and how many syringes they get from those sources, such as vending machines and online retailers. If these sources are not locally available or if an SSP is only examining the adequacy of their own program in meeting people's needs, this variable is unneeded. This variable would be added to the numerator of the basic syringe coverage formula:

$$\frac{((\text{Number of visits to the SSP in the last 30 days} \times \text{Number of syringes retained from the last SSP visit}) + \text{Number of syringes attained from other sources in the last 30 days})}{\text{Number of injections in the last 30 days}} \times 100$$

People with a long history of injecting or low access to SSPs through their injecting career may need multiple syringes for each successful injection.²⁴ In one study where there was widespread needs-based syringe access, 16% of participants needed more than one syringe per successful injection.²⁵ This number may be higher in areas where there is not a history of SSP access.

²³ Bluthenthal, Anderson, et al. 2007

²⁴ Bryant, Paquette, and Wilson 2012; Koester 2012

²⁵ O'Keefe, McCormack, et al. 2017

Asking how many new syringes people need in a day to use a new syringe for each injection or attempted injection instead of asking how many times people inject in a day could account for the use of multiple syringes for each successful injection. Here is the basic syringe coverage formula with this measure added:

$$\frac{\text{Number of visits to the SSP in the last 30 days} \times \text{Number of syringes retained from the last SSP visit}}{\text{Number of syringes needed in 30 days to use a new syringe for each injection or attempted injection}} \times 100$$

See [Appendix 2: Additional Syringe Coverage Measure Formula and Questions](#) for specifically worded questions. Learn about [Data Collection](#) and [Additional Syringe Coverage Measures Analysis](#) in sections below.

Additional Indicators

Demographics and Structural Vulnerability

There are additional demographic and structural vulnerability indicators that SSPs can collect so they may compare syringe coverage levels according to subgroups. These indicators may help SSPs understand if they are underserving some populations as compared to others.

Demographics that have been significantly associated with decreased individual syringe coverage include Black and Latine/x race and ethnicity, male gender, younger age (e.g. 18-25 years old compared to 26-35, 36-45, >45), and engagement in transactional sex work in the previous six months.²⁶ Structural vulnerabilities that have been associated with decreased individual syringe coverage include being unhoused and injecting in public.²⁷ SHaRP's guidance document [Collecting Demographic Data at Syringe Services Programs](#) may be helpful.

Drug Use Characteristics

Data on some drug use characteristics may help SSPs examine if they adequately serve all people who inject drugs, no matter which drug they inject. Injection of stimulants and fentanyl in the previous six months has been associated with lower syringe coverage.²⁸ If not added to the syringe coverage formula, another indicator that may be used is where syringes are

²⁶ Allen et al. 2021; Heller et al. 2009

²⁷ Bluthenthal, Anderson, et al. 2007; Heller et al. 2009

²⁸ Allen et al. 2021; Bryant, Paquette, and Wilson 2012; O'Keefe, Scott, et al. 2017

obtained from. Previous research has shown that people who access SSPs have higher syringe coverage than people who do not.²⁹ See [Appendix 3: Drug Use Questions](#) for specifically worded questions on recent injection drug use and where syringes are obtained from. [Appendix 5: Sample Survey](#) is a sample survey that includes questions on demographics and syringe coverage.

Most academic research measures whether syringe coverage decreases behavioral risks associated with viral and bacterial infections. These risks include syringe reuse and syringe and equipment sharing.³⁰ These studies are useful when defending the importance of SSPs and when trying to understand HIV and HCV transmission in a population. If an SSP finds its participants have inadequate coverage, the program may cite this research to show that inadequate coverage is associated with increased health risks. However, asking these questions adds an additional layer of data collection burden and makes data analysis more complex. Programs should carefully consider if collecting these data is necessary. If a program is interested in these behavioral risk measures, see [Appendix 4: Behavioral Risk Questions](#) for questions on recent syringe reuse, receptive syringe sharing, distributive syringe sharing, and cooker sharing.

²⁹ Allen et al. 2021; Bryant, Paquette, and Wilson 2012; Iversen et al. 2012; O’Keefe, Scott, et al. 2017; O’Keefe et al. 2018

³⁰ Allen et al. 2021; Bluthenthal, Anderson, et al. 2007; Noroozi et al. 2015; O’Keefe et al. 2018; Rezaei et al. 2017; Roth et al. 2015

Data Collection

There are several options for how to collect syringe coverage data. When thinking about these options, it is important to consider good and ethical research practices, such as never requiring participants to provide information. For further guidance, see SHaRP's [Good Practices and Ethical Data Collection at Harm Reduction Programs: A Brief Summary](#). We recommend using point-in-time surveys. Point-in-time surveys collect data during a limited time and allow SSPs to ask a standard set of questions from a portion of their participants (e.g. 10% of participants served in a year, at least 100 participants, etc.), providing a snapshot of the participant population. Syringe coverage often changes over time within the same place and among the same individuals,³¹ so it may be worth measuring coverage at intervals rather than once. Point-in-time surveys may be conducted as needed or regularly (e.g. annually, every two years) so SSPs may analyze trends over time. For guidance on point in time surveys, see SHaRP's "A Short Guide to Conducting Point in Time Surveys at Syringe Services Programs." When creating point-time-surveys, or any other surveys, please remember to pilot test all survey materials with SSP staff and participants.

Some SSPs may consider assessing syringe coverage at intake to obtain a baseline individual coverage before someone begins participating at the SSP. Individual coverage at intake is likely to be low because people often access SSPs when they do not have enough syringes. Collecting coverage data during intake could make the process a burden to staff. Collecting sensitive information, like injection frequency, before staff build rapport with a participant may discourage their involvement with the program.

³¹ Hill, O'Keefe, and Dietze 2018

Data Analysis

Calculating syringe coverage may be completed with statistical software, in a spreadsheet, or with pen and paper. Researchers often use statistical methods to examine the relationship between syringe coverage and additional indicators. If SSPs have someone with statistical experience, they can utilize these methods. Importantly, syringe coverage can also be calculated and interpreted without advanced statistical methods. The next sections will show how.

Target Syringe Coverage

We encourage SSPs to set a target for syringe coverage for their participants, such as 100%, 125%, or 150% coverage. A 100% syringe coverage estimate (i.e. people have about one new syringe for each injection) is the US public health goal because it is associated with less syringe sharing, less syringe reuse, and less HCV transmission.³²

Going above 100% estimated coverage may be important to meet participant needs.³³ Although most people will need one new syringe for each injection, there are other reasons people may need more than one. People may need 125% or 150% coverage because syringes are confiscated by police or easily lost, especially for people who are unstably housed.³⁴ Other people may need more than one syringe for each successful injection.³⁵ Aiming for a higher coverage level helps ensure that people have syringes to account for these situations.

In setting these targets, local context is important. Feasibility is an issue in the US where most harm reduction programs are under resourced. What supplies participants say they need is of most importance to any programming. SSPs may also consider current levels of HCV and HIV in their local population. If harm reduction services have a long history in the area, people may have had longer access to supplies that help them in maintaining vein health. If harm reduction services are new, people have faced more structural barriers to maintaining vein health, and may currently need more syringes to deal with damaged veins. Which drugs are used and the quality of those drugs locally may also affect vein health.

³² Centers for Disease Control and Prevention et al. 1997; Rezaei et al. 2017

³³ Bluthenthal, Anderson, et al. 2007; Bluthenthal, Ridgeway, et al. 2007; Bryant, Paquette, and Wilson 2012; Kwon et al. 2019

³⁴ Bryant, Paquette, and Wilson 2012; Chiang et al. 2022

³⁵ Bryant, Paquette, and Wilson 2012; Koester 2012

Basic Individual Syringe Coverage Analysis

When analyzing and presenting syringe coverage data, most studies turn individual syringe coverage into two values. People with under 100% coverage are considered to have “inadequate syringe coverage,” and people with 100% and greater coverage are considered to have “adequate syringe coverage.”³⁶ In this guidance, coverage is grouped into these two categories. Bluthenthal et al. (2007) grouped participants into four categories, those with less than 50% coverage, 50-99%, 100-149%, and 150% or more and they found significant differences between three of the categories.

Table 1 is a sample spreadsheet that calculates syringe coverage using the basic syringe coverage formula of:

$$\frac{\text{Number of visits to the SSP in the last 30 days} \times \text{Number of syringes retained from the last SSP visit}}{\text{Number of injections in the last 30 days}} \times 100$$

Column A in Table 1 is a unique identifier to show that each row represents a separate participant. While programs may use a unique identifier to attempt to ensure that a person only answers the survey once, programs may also collect data anonymously. For more guidance on unique identifiers, see SHaRP’s [Using Unique identifiers within Syringe Services Programs](#).

Table 1. Calculating Syringe Coverage with the Basic Syringe Coverage Formula in a Spreadsheet

	A	B	C	D	E
1	Participant ID	SSP Visits	Syringes Retained	Injections	Syringe Coverage
2	CA0001	2	60	150	80 ^a
3	CB0002	5	40	90	222.2 ^b
4	CC0003	3	100	320	93.8 ^c

^aThe formula typed into this column to calculate syringe coverage is: =B2*C2/D2*100

^bThe formula typed into this column to calculate syringe coverage is: =B3*C3/D3*100

^cThe formula typed into this column to calculate syringe coverage is: =B4*C4/D4*100

³⁶ Allen et al. 2021; Heller et al. 2009; Hill, O’Keefe, and Dietze 2018; Iversen et al. 2012; McCormack et al. 2016; Noroozi et al. 2015; O’Keefe, Scott, et al. 2017; O’Keefe et al. 2018

From Table 1, row 2, the sample participant, CA0001, has visited the SSP twice in the previous 30 days. They retained 60 syringes for themselves from their last SSP visit. They estimate that they inject 150 times in 30 days. Their syringe coverage estimate is 80%, which means they have enough syringes to use a new syringe for each injection only 80% of the time, so they have inadequate syringe coverage. An Excel file with a Syringe Coverage Example Dataset accompanies this guidance and includes a spreadsheet with the raw data as well as spreadsheets with formulas and calculations.

Syringe coverage may also be calculated by hand. Using data from Table 1, row 2, here is a sample calculation for that participant:

$$\frac{2 \times 60}{150} \times 100 = 80\%$$

Click here to return to the [Basic Syringe Coverage Indicator](#) explanation section.

Additional Syringe Coverage Measures Analysis

Table 2 shows a sample spreadsheet that calculates syringe coverage with the additional variables of number of syringes obtained from other sources and multiple syringes for each successful injection. The formula is:

$$\frac{((\text{Number of visits to the SSP in the last 30 days} \times \text{Number of syringes retained from the last SSP visit}) + \text{Number of syringes obtained from other sources in the last 30 days})}{\text{Number of syringes needed in 30 days to use a new syringe for each injection or attempted injection}} \times 100$$

Table 2. Calculating Syringe Coverage with Two Additional Measures in a Spreadsheet

	A	B	C	D	E	E
1	Participant ID	SSP Visits	Syringes Retained	Syringes from Other Source	Syringes Needed	Syringe Coverage
2	CD0004	4	30	40	135	118.5 ^a
3	CE0005	1	150	0	300	50 ^b
4	CF0006	6	20	10	200	65 ^c

^aThe formula typed into this column to calculate syringe coverage is: $=((B2*C2)+D2)/E2*100$

^bThe formula typed into this column to calculate syringe coverage is: $=((B3*C3)+D3)/E3*100$

^cThe formula typed into this column to calculate syringe coverage is: $=((B4*C4)+D4)/E4*100$

From Table 2, row 2, the sample participant, CD0004, has visited the SSP 4 times in the last 30 days. They retained 30 syringes for themselves from their last SSP visit. They also bought 40 syringes in the previous 30 days from a pharmacy. They need approximately 135 syringes every 30 days to use a new syringe for each injection or attempted injection and they received approximately 160 in the last 30 days. Their syringe coverage estimate is 118.5%, which means they likely have adequate syringe coverage to use a new syringe for each injection or attempted injection. An Excel file with a Syringe Coverage Example Dataset accompanies this guidance and includes a spreadsheet with the raw data as well as spreadsheets with formulas and calculations.

Syringe coverage with the additional measures may also be calculated by hand. Using data from Table 2, row 2, here is a sample calculation for this participant:

$$\frac{(4 \times 30) + 40}{135} \times 100 = 118.5\%$$

Click [here](#) to return to the [Additional Syringe Coverage Variables](#) explanation section.

Reporting Syringe Coverage

When reporting out individual syringe coverage, it is important to note that the indicator is measured at the individual level (i.e. calculated for each individual) rather than the population level (i.e. summarized for the whole population). This guidance documents several ways to report out individual syringe coverage. The next section will show how to compare syringe coverage based on key demographics, which may help a program understand if they are serving different participant populations equitably.

Most SSPs report syringe coverage as the percentage of participants who have inadequate or adequate syringe coverage. In Table 3, syringe coverage of six participants is listed in column B. Whether the coverage is inadequate (less than 100%) or adequate (100% or more) is listed in column C. The data in column C can then be summarized. It would be reported that 66.7% of participants have inadequate syringe coverage and 33.3% of participants have adequate syringe coverage.

Table 3. Reporting Individual Syringe Coverage

	A	B	C
1	Participant ID	Syringe Coverage	Syringe Coverage Adequate
2	CG0007	80	Inadequate
3	CH0008	222.2	Adequate
4	CI0009	93.8	Inadequate
5	CJ0010	118.5	Adequate
6	CK0011	50	Inadequate
7	CL0012	65	Inadequate

Two additional metrics that may be calculated from the Table 3 data are the average and the median. For either, ensure that the individual syringe coverage is calculated for each participant first. Taking the syringe coverage data from column A, the average coverage for these participants is 104.9%. The median is 86.9%. This high average shows that average may not be the best metric for individual coverage because it hides the fact that a few participants were more than adequately covered, while 66.7% of participants still had inadequate syringe coverage. Together, these three metrics (percent with adequate coverage, average, and median) provide an understanding of participants' syringe coverage.

Average

Average is the sum of all the values or observations from a data set divided by the number of values or observations. Pretend this is the data set: 5, 8, 4, 12, 18. First, add all the values together. The sum of all the values is 47. There are 5 values. The average is $47/5$, or 9.4.

Median

Median is the central point of a data set. For a data set with an odd number of values, this is easy to calculate. Pretend this is the data set: 15, 5, 11, 8, 12. First, order the values from smallest to largest, like this: 5, 8, 11, 12, 15. Then, look for the central point. The median is 11.

For a data set with an even number of values, we have to take the average of the two central points. Pretend this is the data set: 4, 20, 13, 9. First, order the values from smallest to largest: 4, 9, 13, 20. Then add the two central points together and divide by two: $(9+13)/2$. The median is 11.

Comparing Syringe Coverage by Groups

Comparing syringe coverage by a particular demographic, structural vulnerability, or drug use characteristic may help SSPs examine if their program is equitably providing syringe services to different participant groups. Table 4 is a snapshot of a spreadsheet for a comparison based on race and ethnicity. Through this table, the total number of participants who identify within each racial and ethnic category and the total number of participants who have inadequate syringe coverage within each racial and ethnic category may be counted.

Table 4. Comparing Individual Syringe Coverage by Race and Ethnicity

	A	B	C	D
1	Participant ID	Race ethnicity	Syringe Coverage	Syringe Coverage Adequate
2	CG0007	Black/African American	80	Inadequate
3	CH0008	Latine/x	222.2	Adequate
4	CI0009	White	93.8	Inadequate
5	CJ0010	White	118.5	Adequate
6	CK0011	Black/African American	50	Inadequate
7	CL0012	Black/African American	65	Inadequate

Table 5 shows how data on individual syringe coverage for an entire program grouped by race and ethnicity may be reported. This information shows that American Indian/Alaska Native and Latine/x participants are more likely to have inadequate syringe coverage. However, these numbers do not provide a reason why. Informal qualitative data, interviews, or focus groups could be used to understand reasons why these inequities exist and may point to actions the SSP could take to address the inequity. For more information about informal qualitative data, please see SHaRP's guidance document, [Leveraging Informal Qualitative Data Collection and Use at Syringe Services Programs](#).

Table 5. Reporting Individual Syringe Coverage Grouped by Race and Ethnicity

Race/Ethnicity	Number of Participants	Percent with Inadequate Syringe Coverage
American Indian/Alaskan Native	27	72.3%
Black/African American	435	57.9%
Latine/x	289	71.8%
White	428	52.6%

Interpreting Syringe Coverage for Funders

Many programs in the US likely have large percentages of participants with inadequate syringe coverage, especially in states and areas where harm reduction receives little to no public funding.³⁷ Inadequate syringe coverage reflects the stigma against harm reduction and people who inject drugs in this country as well as the longstanding underfunding and lack of legal support for SSPs, including policies that restrict SSPs to one-for-one distribution. Countries, such as Australia, with longstanding widespread access to publicly funded SSPs have more people who inject drugs with adequate syringe coverage.³⁸ This context may be important to provide in reporting syringe coverage estimates to funders.

Reporting how syringe coverage was collected may be important to funders. For example, if a program collected syringe coverage information during a point-in-time survey, they may summarize data collection and their results like this in a funding request:

During August and September of 2022, we conducted a point-in-time survey where 215 participants answered questions about the number of times they visited the SSP in the last 30 days, the number of syringes they retained from their last SSP visit, and the number of times they injected in the last 30 days. We used participant answers to calculate syringe coverage for each participant. We found that 110 or 51.2% of participants had inadequate syringe coverage. Due to lack of funding for syringes, we have a cap where participants can only pick up 60 syringes at each visit. With the proposed funding, we will increase that cap to 100 syringes per visit. After we have increase the cap, we will conduct another point-in-time survey in August and September of 2023 to understand if the 100 syringe cap increases the number of participants who have adequate syringe coverage.

³⁷ Allen et al. 2021; Tempalski et al. 2008

³⁸ Kwon et al. 2019

Appendices

Appendix 1: Basic Syringe Coverage Measure Formula and Questions

The basic syringe formula is:

$$\frac{\text{Number of visits to the SSP in the last 30 days} \times \text{Number of syringes retained from the last SSP visit}}{\text{Number of injections in the last 30 days}} \times 100$$

Possible questions to measure **Number of visits to an SSP in the last 30 days**:

- In the last 30 days, how many times have you visited an SSP?³⁹
 - This asks about all SSPs, not a specific SSP
- In the last 30 days, how many times have you visited [name of SSP]?³¹
 - This asks about a specific SSP
- If a program uses a unique identification code, the program could use that code to check number of visits in the last 30 days

Possible question to measure **Number of syringes retained from the last SSP visit**:

- How many syringes did you keep (syringes you did not give, sell, or trade with someone else) from your last SSP visit?³¹
 - This question assumes that participants keep roughly the same number of syringes for each SSP visit

Possible questions to measure **Number of visits to an SSP in the last 30 days** and **Number of syringes retained from the last SSP visit** in a two-question series:

- In the last 30 days, how many new syringes in total did you get? In the last 30 days, how many syringes in total did you give away?⁴⁰

³⁹ Adapted from Bluthenthal, Anderson, et al. 2007

⁴⁰ Adapted from McCormack et al. 2016

Possible questions to measure **Number of injections in the last 30 days**:

- In the last 30 days, how many times have you injected drugs (including intramuscular or skin popping injections)?³¹
 - This question may be better in environments with less injecting overall (i.e. a few times a day or less)
 - This question may be subject to recall bias because it may be difficult for people to remember how many times they injected in the last 30 days
- How many times do you inject drugs on a typical day? (Multiply the answer by 30 to get the number of injections in the last 30 days)⁴¹
 - This question may be easier for people to recall and may be better in environments with more injecting overall (i.e. more than a few times day)
 - This question may be difficult for people to answer because the number of times they inject may fluctuate greatly throughout the week or the month, according to a variety factors, including income, drug availability, and work schedule

⁴¹ Adapted from Allen et al. 2021

Appendix 2: Additional Syringe Coverage Measure Formula and Questions

The formula with additional measures is:

$$\frac{((\text{Number of visits to the SSP in the last 30 days} \times \text{Number of syringes retained from the last SSP visit}) + \text{Number of syringes obtained from other sources in the last 30 days})}{\text{Number of syringes needed in 30 days to use a new syringe for each injection or attempted injection}} \times 100$$

Possible questions to measure **Number of visits to an SSP in the last 30 days**:

- In the last 30 days, how many times have you visited an SSP?⁴²
 - This asks about all SSPs, not a specific SSP
- In the last 30 days, how many times have you visited [name of SSP]?³⁴
 - This asks about a specific SSP
- If a program uses a unique identification code, the program could use that code to check number of visits in the last 30 days

Possible question to measure **Number of syringes retained from the last SSP visit**:

- How many syringes did you keep (syringes you did not give, sell, or trade with someone else) from your last SSP visit?³⁴

Possible questions to measure **Number of visits to an SSP in the last 30 days** and **Number of syringes retained from the last SSP visit** in two-question series:

- In the last 30 days, how many new syringes in total did you get? In the last 30 days, how many syringes in total did you give away?⁴³

Possible question to **measure Number of syringes obtained from other sources in the last 30 days**:

- In the last 30 days, how many syringes did you keep from other sources outside of an SSP?

⁴² Adapted from Bluthenthal, Anderson, et al. 2007

⁴³ Adapted from McCormack et al. 2016

Possible questions to measure **Number of syringes needed in 30 days to use a new syringe for each injection or attempted injection:**

- How many new syringes do you need on a typical day to use a new syringe each time you inject or attempt to inject?⁴⁴
 - Multiply the answer by 30 to get the number of syringes needed every 30 days
- In the last 30 days, how many times have you injected drugs (including intramuscular or skin popping injections)? In the last 30 days, how many new syringes on average have you needed to successfully inject each hit?⁴⁵
 - Answers from these two questions would be multiplied to get the number of syringes needed in 30 days to use a new syringe for each injection or attempted injection

⁴⁴ Adapted from Allen et al. 2021

⁴⁵ Adapted from O'Keefe, McCormack, et al. 2017

Appendix 3: Drug Use Questions

Possible questions to measure **recent injection drug use**:

- In the past 6 months, which of the following drugs have you injected? [check all that apply]
 - Possible answers could be: cocaine, heroin, co-injection of cocaine and heroin, co-injection of meth and heroin, crystal meth, buprenorphine or Suboxone, fentanyl, prescription opioids, other, and declined to answer⁴⁶
 - For all possible answers, include local terms when possible (e.g. speedball, goofball)
 - Include a “declined to answer” option to respect participant autonomy and to differentiate between missing data and data a participant chose not to provide
- In the last 30 days, which of the following drugs have you injected? [check all that apply]
 - Possible answers could be: cocaine, heroin, speedball (co-injection of cocaine and heroin), crystal meth, buprenorphine or Suboxone, fentanyl, prescription opioids, other, and declined to answer³⁸

Possible question to measure **syringe source**:

- In the past 6 months, where have you gotten new syringes from?
 - Possible answers could be: SSP, received from a friend, received from someone who sells drugs, bought from a person, bought online, bought from a store or pharmacy, other, and declined to answer³⁸

⁴⁶ Adapted from Allen et al. 2021

Appendix 4: Behavioral Risk Questions

Most research studies measure risks associated with injection drug use to examine if increased syringe coverage decreases behaviors associated with high risks of viral and bacterial infections. These risks include syringe reuse, receptive syringe sharing (i.e. using a syringe after someone else), distributive syringe sharing (i.e. giving a syringe to someone else after you have already used it), and sharing cookers.⁴⁷

Possible questions to measure **syringe reuse**:

- In the last 30 days, have you reused any of your new syringes?⁴⁸
 - Yes/no binary answer
- How many times, on average, in the last 30 days have you used a single syringe?⁴⁹

Possible questions to measure **receptive syringe sharing**:

- In the last 30 days, have you used a syringe after someone had already used it?⁵⁰
 - Yes/no binary answer
- How many times in the last 30 days have you used a syringe after someone had already used it?⁵¹

Possible questions to measure **distributive syringe sharing**:

- In the last 30 days, have you given your used syringe to another person who then injected drugs with the used syringe?⁴²
 - Yes/no binary answer
- How many times in the last 30 days has someone used a syringe after you have used it?⁴³

Possible questions to measure **cooker sharing**:

- In the last 30 days, have you shared a cooker?⁴²
 - Yes/no binary answer
- How many times in the last 30 days have you shared a cooker?⁴³

⁴⁷ Allen et al. 2021; Bluthenthal, Anderson, et al. 2007; Heinzerling et al. 2006; Noroozi et al. 2015; O’Keefe et al. 2018; Rezaei et al. 2017; Roth et al. 2015

⁴⁸ Adapted from Sharma, Burrows, and Bluthenthal 2007

⁴⁹ Adapted from Heller et al. 2009

⁵⁰ Adapted from Bluthenthal, Anderson, et al. 2007

⁵¹ Adapted from McCormack et al. 2016

Appendix 5: Sample Survey

The Excel Syringe Coverage Example Dataset that accompanies this guidance is based on the following survey. The introduction to the survey is intended to be used for program evaluation, not for academic research. Researchers based at an academic institutions should follow their institutional review board's guidelines for consent.

Introduction

We are asking a few questions about you, your syringe usage, and which drugs you use. We're going to use this information to help make our program better. This survey takes about 5 to 10 minutes and is confidential. You don't have to participate to get our services and you don't have to answer any questions you don't want to. We are giving \$10 cash for participating. If you have any questions, you can ask me or any of our staff.

Demographics

How old are you?	_____
What best describes your racial and/or ethnic identity? [check all that apply]	
<input type="checkbox"/> American Indian/Alaska Native	
<input type="checkbox"/> Asian	
<input type="checkbox"/> Black/African American	
<input type="checkbox"/> Latine/x	
<input type="checkbox"/> Native Hawaiian/Pacific Islander	
<input type="checkbox"/> White	
<input type="checkbox"/> Declined to answer	
What is your current housing status?	
<input type="checkbox"/> Housed	
<input type="checkbox"/> Unhoused	
<input type="checkbox"/> Other: _____	
<input type="checkbox"/> Declined to answer	

Syringe Coverage

In the last 30 days, how many times have you visited an SSP?	_____
How many syringes did you keep (syringes you did not give, sell, or trade with someone else) from your last SSP visit?	_____
In the last 30 days, how many times have you injected drugs (including intramuscular or skin popping injections)?	_____
In the last 30 days, how many new syringes on average have you needed to successfully inject each hit?	_____

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