Title
Syringe access, disposal and recovery to protect the public's health

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Syringe access, disposal and recovery to protect the public's health

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Executive summary

1. Public health principles are based on promoting dignity, equity and compassion for all.
2. San Francisco has made great strides towards "Getting to Zero" HIV infections, deaths, and stigma. However, we face new challenges with persons who inject drugs (PWID), and increases in substance use disorder, mental illness, and homelessness.
3. Residents and visitors are concerned about (a) an increase in people injecting drugs in public and (b) an increase in discarded syringes on the streets of San Francisco.
4. Some have asked whether syringe access programs are distributing too many syringes, and whether this poses a health risk to the general public. This brief reviews the science behind syringe access programs and how they protect the public's health.
5. First, adhering to U.S. Public Health Service and California Department of Public Health (CDPH) policy guidelines, San Francisco deploys a needs-based syringe access program because it is the best evidence-based practice that reduces syringe sharing and reuse among PWID, thereby (a) reducing the acquisition and prevalence of HIV, hepatitis B (HBV), and hepatitis C (HCV), and (b) reducing other complications (e.g., soft tissue infections). CDPH recommends *against* more restrictive or untested syringe access policies (e.g., "one-to-one" or "one-to-one-plus" syringe exchange).
6. Second, keeping the prevalence of infections in PWID as low as possible reduces the risk of infection to health care workers, street cleaning and maintenance workers, and the general public should they experience an unintentional needlestick injury.
7. Third, syringe pollution is a serious problem that is best addressed with a comprehensive syringe disposal and recovery program to reduce contact with discarded syringes. Fortunately, the risk of acquiring HIV infection from a needlestick from a discarded syringe is exceedingly rare (1/1 million to 75/1 million). Furthermore, less than 10 cases of HIV or HCV have been documented from all western countries since 2008.
8. In summary, to protect the public's health, San Francisco's deploys a collective impact approach to (a) reduce syringe sharing, infection, and disease prevalence (by syringe access); (b) reduce contact with discarded syringes (by syringe disposal and recovery); and (c) prevent and reduce needlestick injury harms (occupational safety and health). Furthermore, the proposed safe injection services will saves lives, reduce infections, reduce syringe litter, increase enrollment into drug treatment, and save money.

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Abbreviations

- AIDS = acquired immune deficiency syndrome
- ARCHES = Applied Research, Community Health Epidemiology, and Surveillance
- CDPH = California Department of Public Health
- CHEP = Community Health Equity and Promotion, PHD, SFDPH
- CPHR = Center for Public Health Research
- DPC = Disease Prevention and Control, PHD, SFDPH
- DPH = see SFDPH
- DPW = San Francisco Department of Public Works
- GP = general public
- HBV = hepatitis B virus
- HCV = hepatitis C virus
- HCW = health care worker
- HIV = human immunodeficiency virus
- HOT = Homeless Outreach Team, Department of Homelessness and Supportive Housing
- MSM = men who have sex with men
- PHD = Population Health Division, SFDPH
- PWID = persons who inject drugs
- SAP = syringe access program
- SCM = street cleaning and maintenance (incl. building and grounds) (e.g., DPW staff)
- SEP = "syringe exchange program" (see SAP)[1]
- SFDPH = San Francisco Department of Public Health

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[1] We actively discourage the use of the terms "syringe exchange" or "needle exchange." The word "exchange" promotes an out-dated term and practice that is no longer recommended. Compared to needs-based syringe access, one-to-one syringe "exchange" increases syringe sharing and reuse, and the transmission of bloodborne pathogens (HIV, HBV, HCV).

1 Introduction

At the San Francisco Department of Public Health our approach to addressing substance use, substance use disorder, and infectious diseases is based on (a) the **principles** of primary prevention, harm reduction, univeral access to services, scientific evidence, and guidance by community lived experience and wisdom, and (b) the **universal values** of dignity, equity, compassion, and humility. For example, using this approach, San Franciso has made great strides towards "Getting to Zero"[2] HIV infections, deaths, and stigma (see Figure 1 for new HIV diagnoses and HIV deaths). A key component of our comprehensive strategy is our longstanding syringe access, disposal and recovery program. Likewise, the number of new HIV infection diagnoses in persons who inject drugs (PWID) has also decreased (Figure 2).

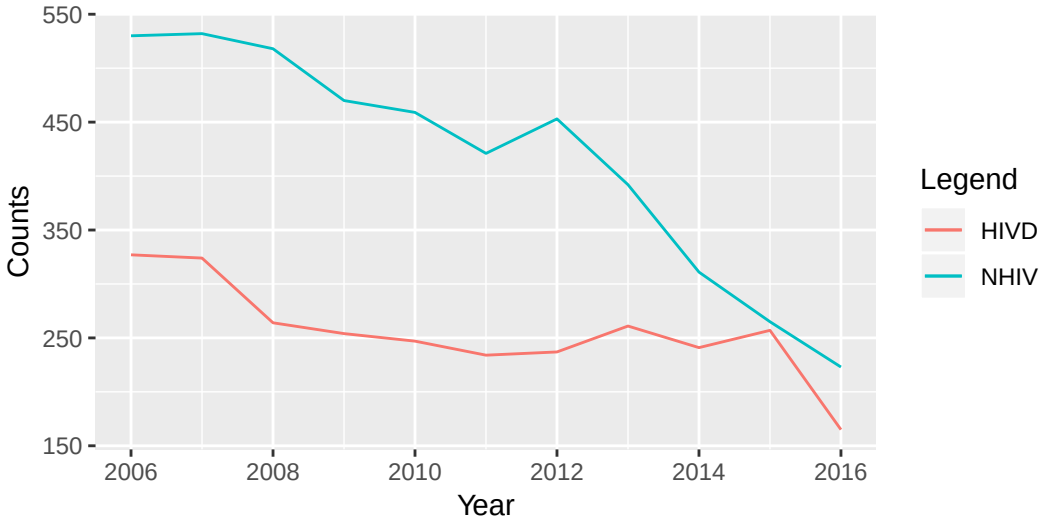


Figure 1. New HIV diagnoses (NHIV) and deaths (HIVD), San Francisco, 2006–2016. In 2016, there were 223 new HIV infections and 165 HIV deaths.

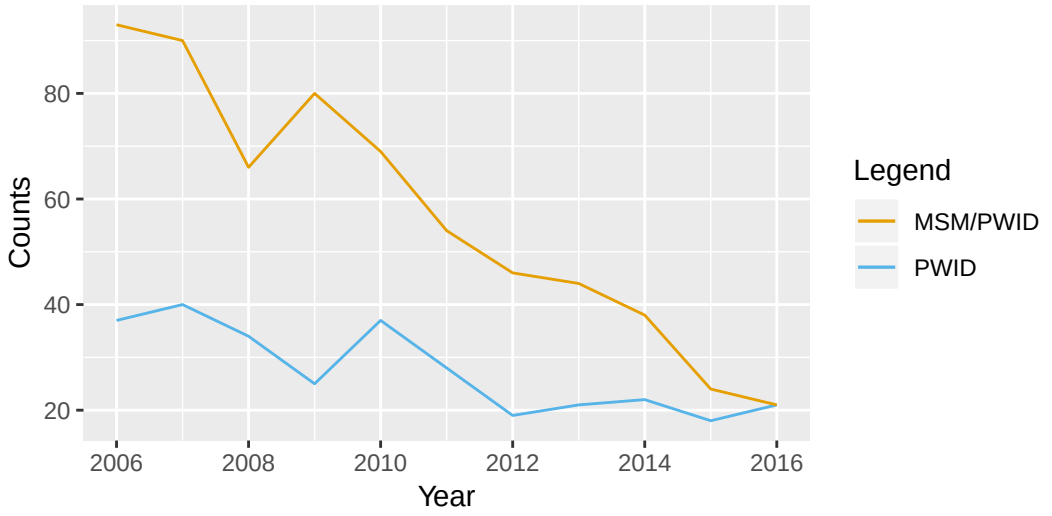


Figure 2. New HIV diagnoses among persons who inject drugs, San Francisco, 2006–2016.

[2] See http://www.gettingtozerosf.org/.

However, we face new challenges with persons who inject drugs (PWID), and increases in substance use disorder, mental illness, and homelessness.

- Residents and visitors are concerned about (a) an increase in people injecting drugs in public and (b) an increase in discarded syringes on the streets of San Francisco.
- Some have asked whether syringe access programs are distributing too many syringes, and whether this poses a health risk to the general public. This paper reviews the science behind syringe access programs and how they protect the public's health.

2 Concepts for protecting and promoting health

How does syringe access, disposal, and recovery work together to protect health? Four groups (in four settings) are at risk for infections from syringes that has been used by a PWID.

1. *Persons who inject drugs* exposed by sharing syringes
2. *Health care workers* exposed by needlesticks in health care settings
3. *SCM workers* with occupational exposures to discarded syringes
4. *General public* in contact with discarded syringes

For group i, where $i = 1$, 2, 3, or 4, the risk of infection (R_i) depends on the following:

- Contact (c_i) rate of needlestick injuries
- Probability (P) that a PWID is infected with a bloodborne pathogen[3]
- Probability (q_i) of infection given needlestick with syringe from an infected PWID[4]

Therefore, over a year, for a random individual from group i, the risk of infection is

$$R_i = c_i P q_i$$

This equation is deceptively simple and informative. For all groups the infection risks depend on the prevalence of infections (HIV, HBV, HCV) in PWID. Infected PWID are the "source" of infection for all groups (Figure 3). The key drivers of infection risk are PWID prevalence of infections, PWID syringe sharing (c_1), and health care worker needlesticks (c_2). Because infection risks from discarded syringes are extremely low (very low q_3 and q_4), contact with discarded syringes in the community are not drivers of infection risk. Less than 10 cases of HIV or HCV have been documented from all western countries since 2008 [1].

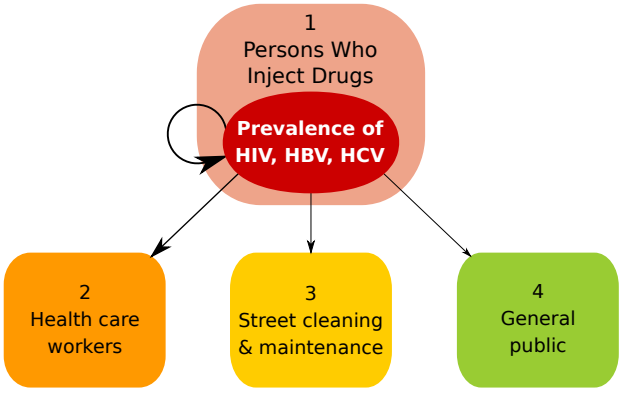


Figure 3. Four groups are at risk for acquiring infections from needlestick injuries: (1) persons who inject drugs by sharing syringes, (2) health care workers, (3) SCM workers, and (4) the general public. Each arrow represents the causal risk relationship ($R_i = c_i P q_i$). The risks to non-health care workers (arrow 3) and the general public (arrow 4) are extremely low.

[3] The first approximation is the prevalence of infection. For PWID, prevalence is the number of infected PWID divided by the total number of PWID.

[4] Also called the transmission probability.

Therefore, the most important driver of infection from a needlestick is the probability that the "source" of the syringe (a PWID) is infectious with a bloodborne pathogen. We estimate this probability by the prevalence of infections (HIV, HBV, and HCV) in PWID. PWID are the most important risk group to prevent infections because they (a) have the highest risk of becoming infected *and* (b) are the source of infection for all risk groups.

3 Syringe access policy guidance from the United States Public Health Service and the California Department of Public Health

3.1 California Department of Public Health

"The California Department of Public Health, Office of AIDS advises syringe exchange programs (SEPs) to adopt **needs-based distribution policies** with the goal of ensuring that program participants have a new, sterile syringe and other injection equipment for each injection" [2].

"Restrictive syringe access policies such as variations on one-for-one exchange or the imposition of limits on the number of syringes participants may acquire per transaction are not supported by public health evidence and may im pose harm upon SEP participants" [2].

"This recommendation follows the U.S. Public Health Service guidance that advises people who inject drugs to use a new, sterile needle and syringe for each injection" [2].

"California SEPs currently employ several different models of syringe distribution, including (a) strict one- for-one exchange in which used syringes are required to be returned for an equal number of new syringes, (b) 'one-for-one-plus' models which provide a fixed number of additional syringes (e.g. 10) beyond the number returned, (c) limits on the total number of syringes that may be acquired during a single transaction, and (d) needs-based distribution that provides an unlimited number of syringes based on how many PWID request. **Policymakers have sometimes instituted restrictive syringe access policies in the belief that such policies would reduce syringe litter or serve as a means of changing behavior among PWID [3]. These concerns have not been born out in research on syringe distribution policies**" (*strong emphasis added*) [2].

3.2 San Francisco

Adhering to U.S. Public Health Service and California Department of Public Health (CDPH) policy guidelines, San Francisco deploys a needs-based syringe access program because it is the best evidence-based practice that reduces syringe sharing and reuse among PWID, thereby (a) reducing the acquisition and prevalence of HIV, hepatitis B, and hepatitis C, and (b) reducing other complications [2,4,5]. CDPH recommends *against* more restrictive policies (e.g., "one-to-one" or "one-to-one-plus" policies) [4]. For full reference list see [4].

Keeping the prevalence of infections in PWID as low as possible reduces the risk of infection to health care workers, SCM workers, and the general public should they experience an unintentional needlestick injury. Fortunately, the risk of acquiring HIV infection from a needlestick injury from a discarded syringe is exceedingly rare (1/1 million to 75/1 million). Furthermore, less than 10 cases of HIV or HCV have been documented from all western countries since 2008 [1].

To protect the public's health and improve quality of life, San Francisco's deploys a collective impact approach to (a) reduce syringe sharing, infection, and disease prevalence (via syringe access); (b) reduce contact with discarded syringes (via syringe disposal and recovery); (c) prevent and reduce needlestick injuries (via occupational safety and health).

4 Infection risk from unintended needlestick injuries from discarded syringes for street cleaning and maintenance (SCM) workers and the general public

People are understandably concerned whether they are at risk for infection from an unintended needlestick injury from a discarded syringe in the community. The best data to answer this question comes from workers' compensation claims for SCM workers who experienced unintentional needlestick injuries. In 2015, the University of California, Berkeley published a study to examine "the risk that sharps in SCM occupational settings will result in HIV, HBV, or HCV infections" [1].

Below is the entire executive summary:

- "A review of research literature on non-health care, occupational sharps injuries found an extremely small number of confirmed cases of either HIV of HCV being transmitted by needlestick injuries outside health care settings. The combined number in developed, western countries appears to be less than 10 total for all countries from the onset of the AIDS epidemic through 2008."
- "An analysis of the research on the mechanism of transmission was consistent with the findings of very few cases. We estimate that the risk of HIV from a work related needlestick injury converting to an HIV infection was 1/1 million to 75/1 million when the needle was from an intravenous (IV) drug user. For home-health sourced waste, the risk of infection may be as small as 1/100 million needlesticks."
- "A review of data from the Division of Workers' Compensation Information System found that needlestick injuries were uncommon. In non-health care settings, approximately 1/10,000 workers will experience a needlestick injury in any year. These numbers are higher in specific industries and occupations, but still in the area of 1/1,000 workers per year."
- "When needlestick injuries occur, the workers' compensation claim costs are very low and the presence of temporary and permanent disability is also very low. Needlesticks are almost all very low cost medical-only claims. We found no evidence of seroconversion to any of the three major infections for any non-health care occupational cases in California between 2010 and 2012."
- "Prophylactic treatment after needlesticks, a measure of the risk perceived by health care providers and patients, is also infrequent. Only 1.2% of these injuries received prophylactic treatment."

5 Role of syringe disposal and recovery programs

Syringe disposal and recovery is the third arm of a three-prong strategy to reduce syringe litter, and public contact with and concern about discarded syringes [6,7]. San Francisco deploys a collective impact approach and the partners include community members, community-based organizations, District Supervisors, and city agencies (311; Public Works, Public Health, Recreation and Parks, Homelessness and Supportive Housing, and Police) (Appendix, p. 11).

Thirteen syringe sites operate in San Francisco. Each execute a written disposal plan that includes recovery and street area sweeps. The programs also conduct targeted syringe clean-up throughout the City by a public health Community Health Response team. The SFDPH also funds outreach teams, including a new 10-person Clean-up crew that picks up discarded syringes 7 days per week.

In San Francisco has 16 outdoor sharps containers (10 smaller boxes and 6 larger kiosks). Please see map and list for locations (Appendix, p. 12). The San Francisco AIDS Foundation sponsors weekly "Community Clean-up" event every Friday from 2 pm to 4 pm. The meet-up location is 117 6th Street. This is an opportunity for community to get involved.

A Appendix

A.1 Selected data tables

In 2016, there were 16,010 living with HIV (74% MSM, 6% PWID, 15% MSM-PWID, 4% heterosexual, and 2% other). There 223 wewly diagnosed HIV cases (74% MSM, 3% PWID, 3% MSM-PWID, 10% heterosexual, and 10% other) [8].

Table 1. New HIV infections and HIV-related deaths, San Francisco, 2006–2016

New HIV ...	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Infections	530	532	518	470	459	421	453	392	311	265	223
Deaths	327	324	264	254	247	234	237	261	241	257	165

Table 2. New HIV diagnoses among persons who inject drugs, San Francisco, 2006–2016

Risk group	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
PWID	37	40	34	25	37	28	19	21	22	18	21
MSM/PWID	93	90	66	80	69	54	46	44	38	24	21

Table 3. Syringe access, disposal and recovery program data, San Francisco, 2016–2017

Description	Data
Syringe Access, Disposal, and Recovery sites[a]	13
Syringes distributed 2016-2017	4,455,361
Syringes allowed per person	need-based
Syringes returned	~2,986,121

[a]SFDPH funds the San Francisco AIDS Foundation that subcontracts with GLIDE, St.James Infirmary, San Francisco Drug User's Union, and Homeless Youth Alliance

Table 4. Range estimates for components of infection for bloodborne pathogens, by risk group

Components of risk	PWID	HCW	SCM	GP
Risk group i	1	2	3	4
Contact (c_i)	0.395[a]	80.8e-04, 157e-04[b]	1e-04, 0.92e-03[c]	$< 1e-04$[d]
Prevalence (P)				
- HIV	0.168[e]	1.83e-05[f]	1.83e-05[f]	1.83e-05[f]
- Chronic HBV	0.027[g], 0.118[h]	0.003, 0.005[g]	0.003, 0.005[g]	0.003, 0.005[g]
- Chronic HCV	0.421[i]	< 0.018[i]	< 0.018[i]	< 0.018[i]
Transm. prob. (q_i)				
- HIV	63e-04[j]	23e-04[j]	1e-06, 75e-06[c]	1e-06, 75e-06[c]
- Chronic HBV	>HCV[k]	0.23, 0.62[l]	>HIV[k]	>HIV[k]
- Chronic HCV	>HIV[k]	0.019[m]	>HIV[k]	>HIV[k]

[a]Proportion that reported sharing [9]; [b][10]; [c][1]; [d]assumption [e][11]; [f][12]; [g][13]; [h][14]; [i][15]; [j][16]; [k]The transmission probability of HBV or HCV after a needlestick from a contaminated discarded syringe is not known precisely. It is considered extremely low: so low that less than 10 cases of HIV or HCV have been documented from all western countries since 2008 [1]. [l][17]; [m][18];

A.2 Risk of infection from discarded syringes in the community

Four groups (in four settings) are at risk for infection from a needlestick injury from a syringe that has been used by a PWID: (1) persons who inject drugs (PWID) by sharing syringes, (2) health care workers (HCW) in health care settings, (3) street cleaning and maintenance (SCM) workers with exposures in the community (e.g., street clean-up), (4) general public (GP) in contact with discarded syringes in the community. In this section we focus on groups 3 and 4. Figure 4 depicts the three-prong approach to reduce infection risks from discarded syringes in the community. From the risk equation ($R_i = c_i P q_i$.) we know to focus on prevalence of infections in PWID (P), contact ($c_{3 \text{ or } 4}$) rate with discarded syringes, and transmission probability (q_i) from a needlestick assuming contamination with an infection.

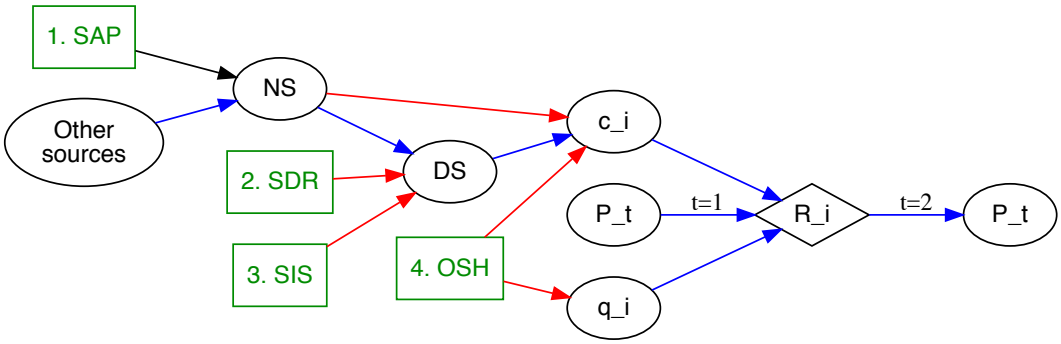


Figure 4. Influence diagram of risk of infection (R_i) to persons exposed to discarded syringes. Diagram depicts synergistic policy options: Syringe Access Program (SAP), Syringe Disposal and Recovery (SDR), Safe Injections Services (SIS), and Occupational Safety and Health (OSH); number of syringes (NS) distributed, number of discarded syringes (DS), prevalence ($P_{t=\{1,2\}}$) of infection in PWID over time (HIV, HBV, HCV), contact (c_i) rate with syringes (c_1 is sharing, $c_{2,3, \text{ or } 4}$ are unintentional needlesticks), and probability of infection (q_i) given contact with a syringe from an infected PWID. PWID also get syringes from other sources. Red arrows means balancing influence (i.e., opposite direction) and blue arrow means reinforcing influence (i.e., same direction). The risk of infection from discarded syringes is extremely low.

The qualitative functional relationships between the nodes are well established (i.e., balancing and reinforcing influences [19]). For example, going from no syringe access to syringe access increases the number of syringes used and discarded, but also decreases the transmission and prevalence of infections. Likewise, needs-based syringe access is more effective than one-to-one syringe exchange in decreasing the transmission and prevalence of bloodborne infections. However, these functional relationships are not quantitatively precise.

Similarly, more distributed syringes results in more discarded syringes, more community exposures, and possibly more needlestick injuries. This relationship is not well studied; however, occupational exposures and risk of infection are well known in California from workers' compensation data [1]. Needlestick exposure risks for SCM workers ranges from 1/10,000 to 1/1000 per worker per year. General public exposure would be much lower.

In San Francisco, there are about 24,492 PWID [15]. The prevalence of infection (P) for PWID is 16.8% for HIV infection [11] and 42.1% for HCV infection [15]. The transmission probabilities (q_i) for SCM workers can be estimated by anchoring to known probabilities in the health care setting, and then adjusted for source viral load, syringe blood volume, and virus degradation in the environment. Next, we calculate the range of infection risks based on plausible values for prevalence of infection in PWID, contact (needlestick) rates, and transmission probabilities. Together, Figures 4 and 5, and the risk matrices (next page) can guide policy directions. *To maximally protect the public's health the best approach is to optimize each policy option with the best evidence-based practices and innovation.*

```
#### HIV infection
qbase <- 3/1000; vload <- 1; bloodvol <- .1; degradat <- .1
q0 <- qbase*vload*bloodvol*degradat
cc <- seq(1/10000,1/1000,length=10); lcc <- length(cc)
pp <- seq(.10,.65,by=.05); lpp <- length(pp); risk <- matrix (NA, lcc, lpp)
for (i in 1:lcc){
  for (j in 1:lpp){
    risk[i,j] <- cc[i]*pp[j]*q0 }}
rownames(risk) <- cc; colnames(risk) <- pp
tab.hiv.infection.risks <- signif(risk*100000000,3)
names(dimnames(tab.hiv.infection.risks)) <- c("Contact",
  "Prevalence of infection in PWID")
tab.hiv.infection.risks # risk of infection per 100 million per year
```

```
##        Prevalence of infection in PWID
## Contact  0.1  0.15  0.2  0.25  0.3  0.35  0.4  0.45  0.5  0.55  0.6  0.65
##   1e-04 0.03 0.045 0.06 0.075 0.09 0.105 0.12 0.135 0.15 0.165 0.18 0.195
##   2e-04 0.06 0.090 0.12 0.150 0.18 0.210 0.24 0.270 0.30 0.330 0.36 0.390
##   3e-04 0.09 0.135 0.18 0.225 0.27 0.315 0.36 0.405 0.45 0.495 0.54 0.585
##   4e-04 0.12 0.180 0.24 0.300 0.36 0.420 0.48 0.540 0.60 0.660 0.72 0.780
##   5e-04 0.15 0.225 0.30 0.375 0.45 0.525 0.60 0.675 0.75 0.825 0.90 0.975
##   6e-04 0.18 0.270 0.36 0.450 0.54 0.630 0.72 0.810 0.90 0.990 1.08 1.170
##   7e-04 0.21 0.315 0.42 0.525 0.63 0.735 0.84 0.945 1.05 1.160 1.26 1.370
##   8e-04 0.24 0.360 0.48 0.600 0.72 0.840 0.96 1.080 1.20 1.320 1.44 1.560
##   9e-04 0.27 0.405 0.54 0.675 0.81 0.945 1.08 1.220 1.35 1.490 1.62 1.760
##   0.001 0.30 0.450 0.60 0.750 0.90 1.050 1.20 1.350 1.50 1.650 1.80 1.950
```

```
#### HCV infection
qbase <- 1/100; vload <- 1; bloodvol <- .1; degradat <- .5
q0 <- qbase*vload*bloodvol*degradat
cc <- seq(1/10000,1/1000,length=10); lcc <- length(cc)
pp <- seq(.10,.65,by=.05); lpp <- length(pp); risk <- matrix (NA, lcc, lpp)
for (i in 1:lcc){
  for (j in 1:lpp){
    risk[i,j] <- cc[i]*pp[j]*q0 }}
rownames(risk) <- cc; colnames(risk) <- pp
tab.hcv.infection.risks <- signif(risk*100000000,3)
names(dimnames(tab.hcv.infection.risks)) <- c("Contact",
  "Prevalence of infection in PWID")
tab.hcv.infection.risks # risk of infection per 100 million per year
```

```
##        Prevalence of infection in PWID
## Contact 0.1 0.15 0.2  0.25  0.3  0.35 0.4  0.45  0.5  0.55 0.6  0.65
##   1e-04 0.5 0.75   1  1.25  1.5  1.75   2  2.25  2.5  2.75   3  3.25
##   2e-04 1.0 1.50   2  2.50  3.0  3.50   4  4.50  5.0  5.50   6  6.50
##   3e-04 1.5 2.25   3  3.75  4.5  5.25   6  6.75  7.5  8.25   9  9.75
##   4e-04 2.0 3.00   4  5.00  6.0  7.00   8  9.00 10.0 11.00  12 13.00
##   5e-04 2.5 3.75   5  6.25  7.5  8.75  10 11.30 12.5 13.80  15 16.30
##   6e-04 3.0 4.50   6  7.50  9.0 10.50  12 13.50 15.0 16.50  18 19.50
##   7e-04 3.5 5.25   7  8.75 10.5 12.20  14 15.80 17.5 19.20  21 22.80
##   8e-04 4.0 6.00   8 10.00 12.0 14.00  16 18.00 20.0 22.00  24 26.00
##   9e-04 4.5 6.75   9 11.20 13.5 15.70  18 20.30 22.5 24.80  27 29.20
##   0.001 5.0 7.50  10 12.50 15.0 17.50  20 22.50 25.0 27.50  30 32.50
```

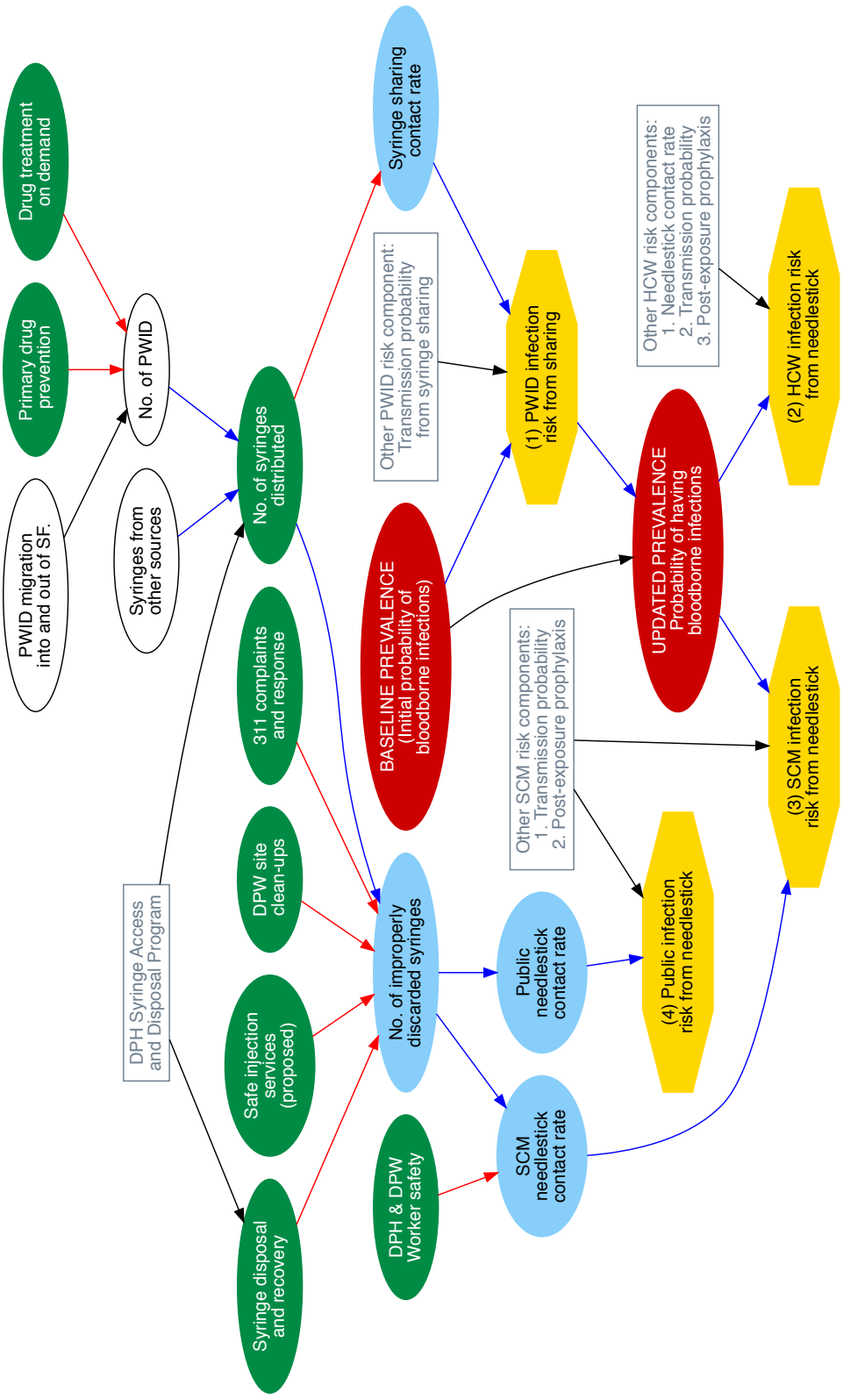


Figure 5. Systems model of syringe access, disposal, and recovery activities, and health risk outcomes (yellow). Green nodes are key interventions. Red and blue nodes are key drivers of risk.

POPULATION HEALTH DIVISION
SAN FRANCISCO DEPARTMENT OF PUBLIC HEALTH

Key Activities

SFPD:

- Partners with DPH to address concerns about discarded syringes
- Partners with DPH to provide roll-call trainings
- Partners with DPH to provide presentations or updates at community meetings
- Partners with DPH to strategize on comprehensive plan to address improperly discarded syringes

DPW:

- Informs DPH about Hot spots
- Provides clean up services
- Partners with DPH to strategize on comprehensive plan to address improperly discarded syringes
- DPW Community Liaison partners with DPH Community Liaison at community meetings
- Participates in quarterly "disposal efforts" meeting

HOT:

- Provides bio-bins and fit-packs at encampments
- Provides education about syringe disposal
- Informs DPH Community Liaison of encampment hot spots
- HOT team staff partner with DPH community liaison at community meetings

CBOs:

- Provide sweeps in the community
- Respond to requests for "emergency" syringe clean-up
- Provides syringe access & disposal services
- Provide trainings to the community
- Partner with DPH Community Liaison to address community concerns
- Participate in quarterly disposal efforts meeting

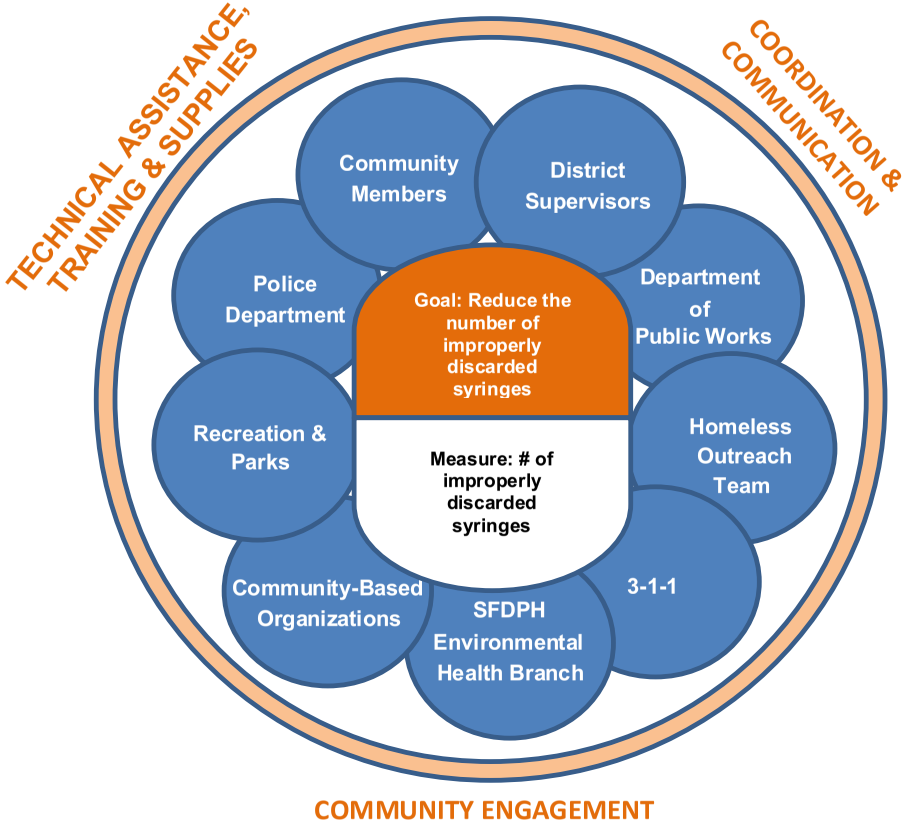
Recreation & Parks:

- Provide syringe clean-up in SF parks
- Inform DPH of Hot spots and/or trends in discarded syringes
- Partner with one of our funded providers to coordinate efforts around syringe clean-up and disposal

San Francisco's Collective Impact Approach to Syringe Disposal Services

The **Community Health Equity & Promotion (CHEP)** Branch:

- **coordinates** the collective impact effort;
- provides **technical assistance, training, and supplies** (such as syringe disposal boxes) to key partners;
- **communicates** with key stakeholders (such as the Board of Supervisors); and
- **engages community members** to address concerns and ensure ongoing support and buy-in for syringe access services; and
- **monitors progress** towards the goal and implements **quality improvement.**



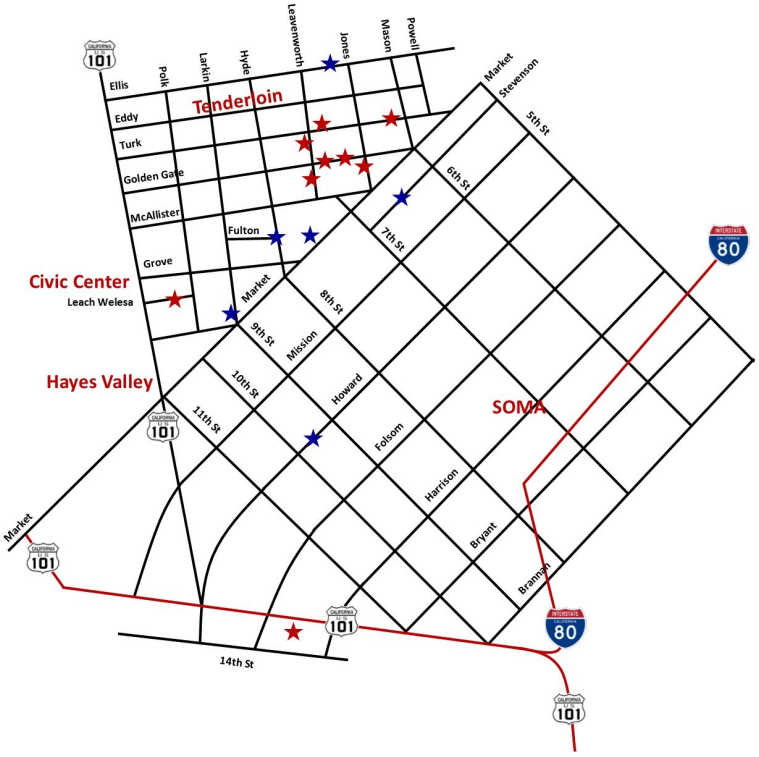
Civic Center
- ★ Bill Graham Civic Auditorium (Larking @ Hayes)
- ★ Main Library (Fulton@ Hyde)
- ★ United Nations Plaza
- ★ 50 Leach Walesa near Tom Waddell Clinic

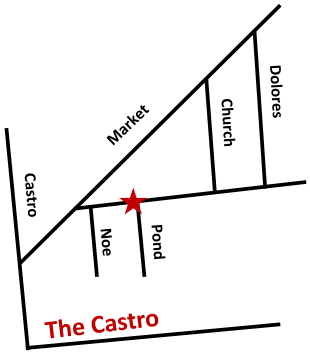
Tenderloin
- ★ 330 Ellis next to Glide
- ★ 149 Turk
- ★ 290 Turk
- ★ I46 Leavenworth between McAllister & Golden Gate
- ★ 45 Jones
- ★ 150 Golden Gate
- ★ 133 Golden Gate (ST. Boniface)

SOMA
- ★ 1380 Howard
- ★ Stevenson Between 6th & 7th
- ★ Trainor between 14th & Division

Castro
- ★ Eureka Valley Library Parking Lot @ Pond

24 Hour Syringe Disposal Location
(as of 07/26/18)





★ **Kiosk**

★ **Small Disposal Box**

Selected resources

a. San Francisco AIDS Foundation. Online articles on the science and art of syringe accesss. Available from: https://betablog.org/?s=syringe
b. California Department of Public Health. Needle Exchange and Syringe Access. Available from: https://www.cdph.ca.gov/Programs/CID/DOA/Pages/OA_prev_needle_exchange_syringe.aspx
c. California Department of Public Health. Syringe Exchange Programs in California. Available from: https://www.cdph.ca.gov/Programs/CID/DOA/Pages/OA_prev_sep.aspx
d. Persad P, Saad F, Schulte J (2017). Comparison between needs-based and one-for-one models for Syringe Exchange Programs. Louisville Metro Department of Public Health and Wellness, Louisville, Kentucky. Available from: https://louisvilleky.gov/sites/default/files/health_and_wellness/oppe_-_datareports/seprptneedsbasedvsoneforone2017.pdf
e. Centers for Disease Control and Prevention. Syringe Services Programs. Available from: https://www.cdc.gov/hiv/risk/ssps.html

References

1. Neuhauser F, Shor G, Jackson R. Infection risk from "sharps" injuries for non-healthcare workers [Internet]. University of California, Berkeley; 2015. Available from: https://www.dir.ca.gov/Chswc/Reports/2015/sharps_3-25-15.pdf

2. California Department of Public Health. Guidelines for syringe exchange programs funded by the california department of public health, office of AIDS [Internet]. California Department of Public Health, Center for Infectious Diseases, Office of AIDS; 2017. Available from: https://www.cdph.ca.gov/Programs/CID/DOA/CDPH%20Document%20Library/Guidelines%20for%20SEPs_ADA.pdf

3. Backes G, Rose V. Primary and secondary analysis of local elected officials' decisions to support or oppose pharmacy sale of syringes in california. J Urban Health [Internet]. 2010;87(4):553–60. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2900575/

4. California Department of Public Health. Issue brief: Syringe access policies for California syringe exchange programs [Internet]. California Department of Public Health, Office of AIDS; 2017. Available from: https://www.cdph.ca.gov/Programs/CID/DOA/CDPH%20Document%20Library/CDPH%20SEP%20Distribution%20Policy%20Issue%20Brief%20(Approved%20w%20Logos).pdf

5. Land E. We say "needle exchange," but open access—not one-for-one exchange—is best for health. Betablogorg [Internet]. 2018; Available from: https://betablog.org/open-access-syringes-better-than-one-for-one-needle-exchange/

6. Land E. Syringe access programs increase safe syringe disposal. Betablogorg [Internet]. 2018; Available from: https://betablog.org/syringe-access-programs-increase-safe-syringe-disposal/

7. Land E. Syringes and needles on the street in San Francisco: What's being done. Betablogorg [Internet]. 2018; Available from: http://betablog.org/syringes-needles-street-san-francisco-whats-being-done/

8. San Francisco Department of Public Health. HIV Epidemiology Annual Report 2016 [Internet]. San Francisco Department of Public Health; 2017. Available from: https://www.sfdph.org/dph/files/reports/RptsHIVAIDS/Annual-Report-2016-20170831.pdf

9. Coffin PO, Jin H, Huriaux E, Mirzazadeh A, Raymond HF. Trends in use of health care and HIV prevention services for persons who inject drugs in San Francisco: Results from national hiv behavioral surveillance 2005–2012. Drug Alcohol Depend. 2015 Jan;146:45–51.

10. Shah SM, Bonauto D, Silverstein B, Foley M. Workers' compensation claims for needlestick injuries among healthcare workers in Washington State, 1996-2000. Infect Control Hosp Epidemiol. 2005 Sep;26(9):775–81.

11. Kim N, Welty S, Reza T, Sears D, McFarland W, Raymond H. HIV care outcomes among persons who inject drugs in san francisco, 2009-2015. Conference Abstract 68973: Infectious Disease Society of America. 2018 Oct;

12. Ling H. Seroprevalence of human immunodeficiency virus in San Francisco, 2015. Personal communication; 2018.

13. Centers for Disease Control and Prevention. Recommendations for identification and public health management of persons with chronic hepatitis b virus infection. Morbidity and Mortality Weekly Report Recommendations and reports [Internet]. 2008 Sep;57(RR-8). Available from: https://www.cdc.gov/mmwr/pdf/rr/rr5708.pdf

14. Nelson PK, Mathers BM, Cowie B, Hagan H, Des Jarlais D, Horyniak D, et al. Global epidemiology of hepatitis B and hepatitis C in people who inject drugs: Results of systematic reviews. Lancet. 2011 Aug;378(9791):571–83.

15. Facente SN, Grebe E, Burk K, Morris MD, Murphy EL, Mirzazadeh A, et al. Estimated hepatitis C prevalence and key population sizes in San Francisco: A foundation for elimination. PLoS ONE [Internet]. 2018;13(4):e0195575. Available from: http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0195575

16. Patel P, Borkowf CB, Brooks JT, Lasry A, Lansky A, Mermin J. Estimating per-act HIV transmission risk: A systematic review. AIDS. 2014 Jun;28(10):1509–19.

17. Centers for Disease Control and Prevention. CDC guidance for evaluating health-care personnel for hepatitis b virus protection and for administering postexposure management. Morbidity and Mortality Weekly Report Recommendations and reports [Internet]. 2013 Dec;62(RR-10):1–19. Available from: https://www.cdc.gov/mmwr/preview/mmwrhtml/rr6210a1.htm

18. Henderson DK. Managing occupational risks for hepatitis C transmission in the health care setting. Clin Microbiol Rev. 2003 Jul;16(3):546–68.

19. Stroh D. Systems thinking for social change: A practical guide to solving complex problems, avoiding unintended consequences, and achieving lasting results. Chelsea Green Publishing; 2015.