



Non-Viral Infections in Persons who Inject Drugs

SE ATEC Webcast Wednesday, June 26, 2019

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UNC

INSTITUTE FOR GLOBAL HEALTH
& INFECTIOUS DISEASES

Disclosures

- Training grant from NIH (T32AI070114)

Disclaimer

- This presentation will reference the existence of certain harm reduction strategies that may not be legal in all states or, in the case of supervised drug consumption facilities, may not be legal under federal laws. This presentation is intended to be a review of existing evidence. It is not instructing anyone to engage in unlawful activity.

Educational Objectives

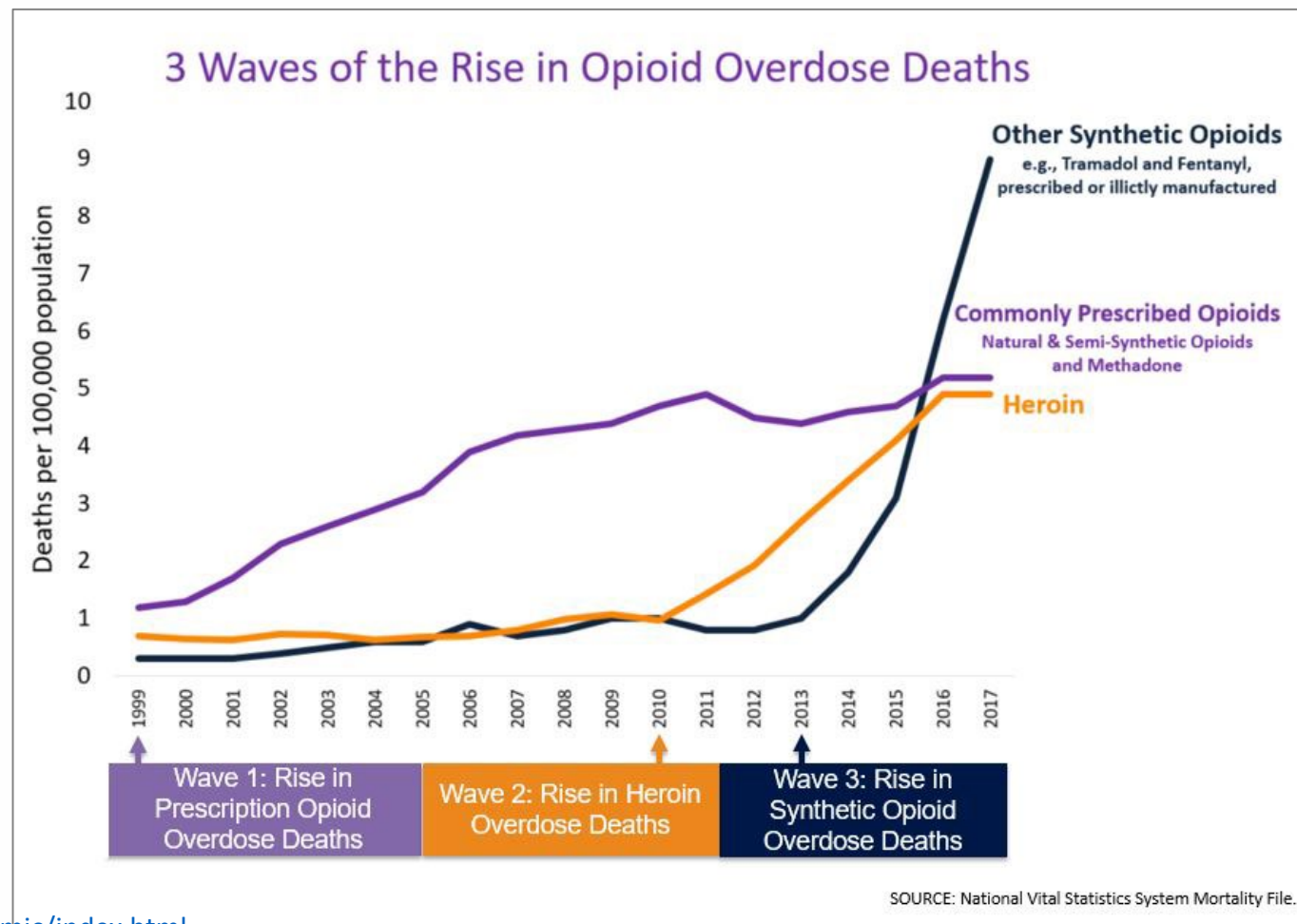
1. Be familiar with the bacterial and fungal infections of particular concern to persons who inject drugs (PWID)
2. Understand the growing impact of infective endocarditis among PWID and the unique management challenges it poses
3. Know the tools available for infection prevention in PWID



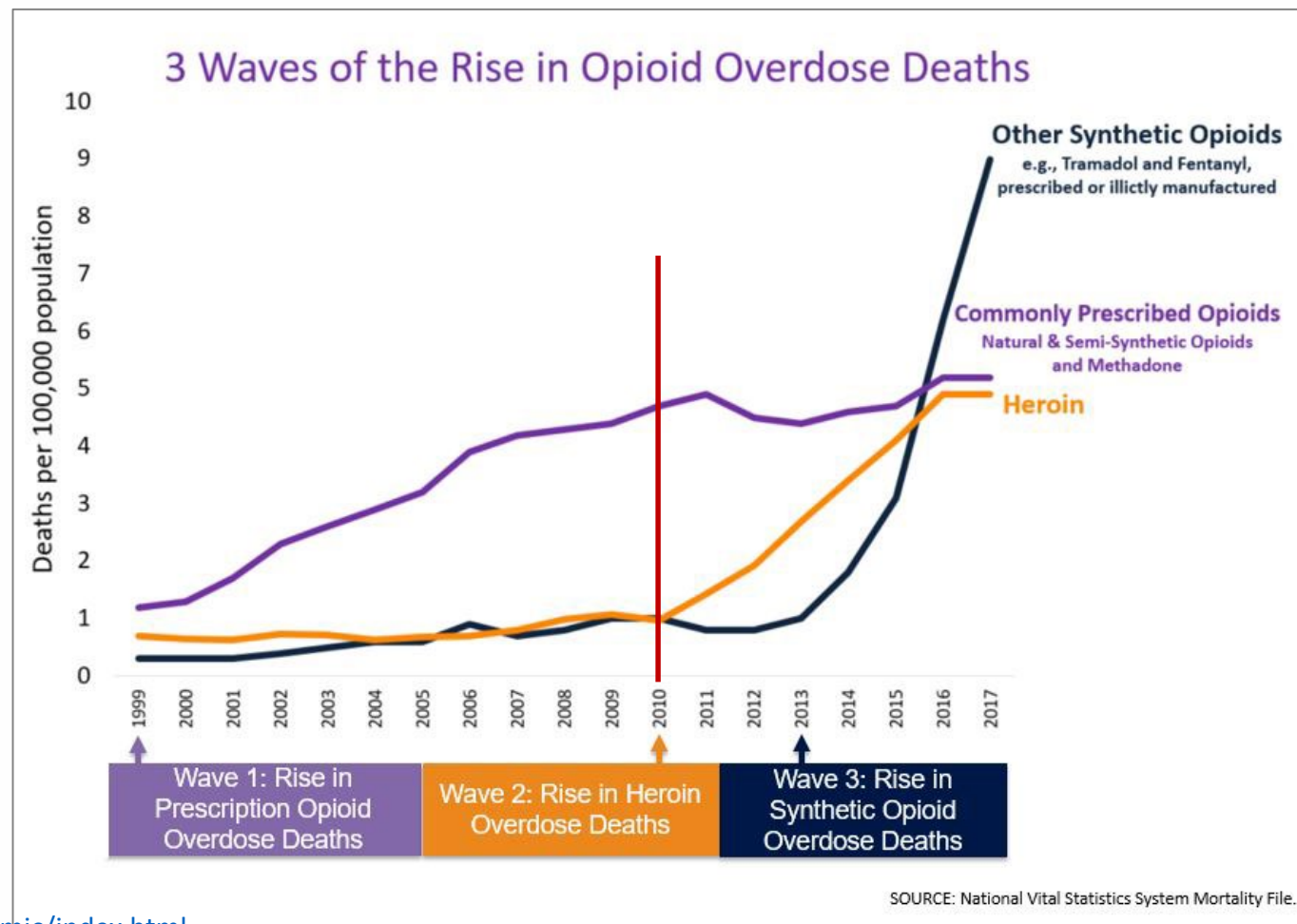
Outline

- Quick take on opioid crisis
- Infections of concern to people who inject drugs
- Epidemiology of infective endocarditis
 - Recent data on NC
- Prevention strategies and harm reduction

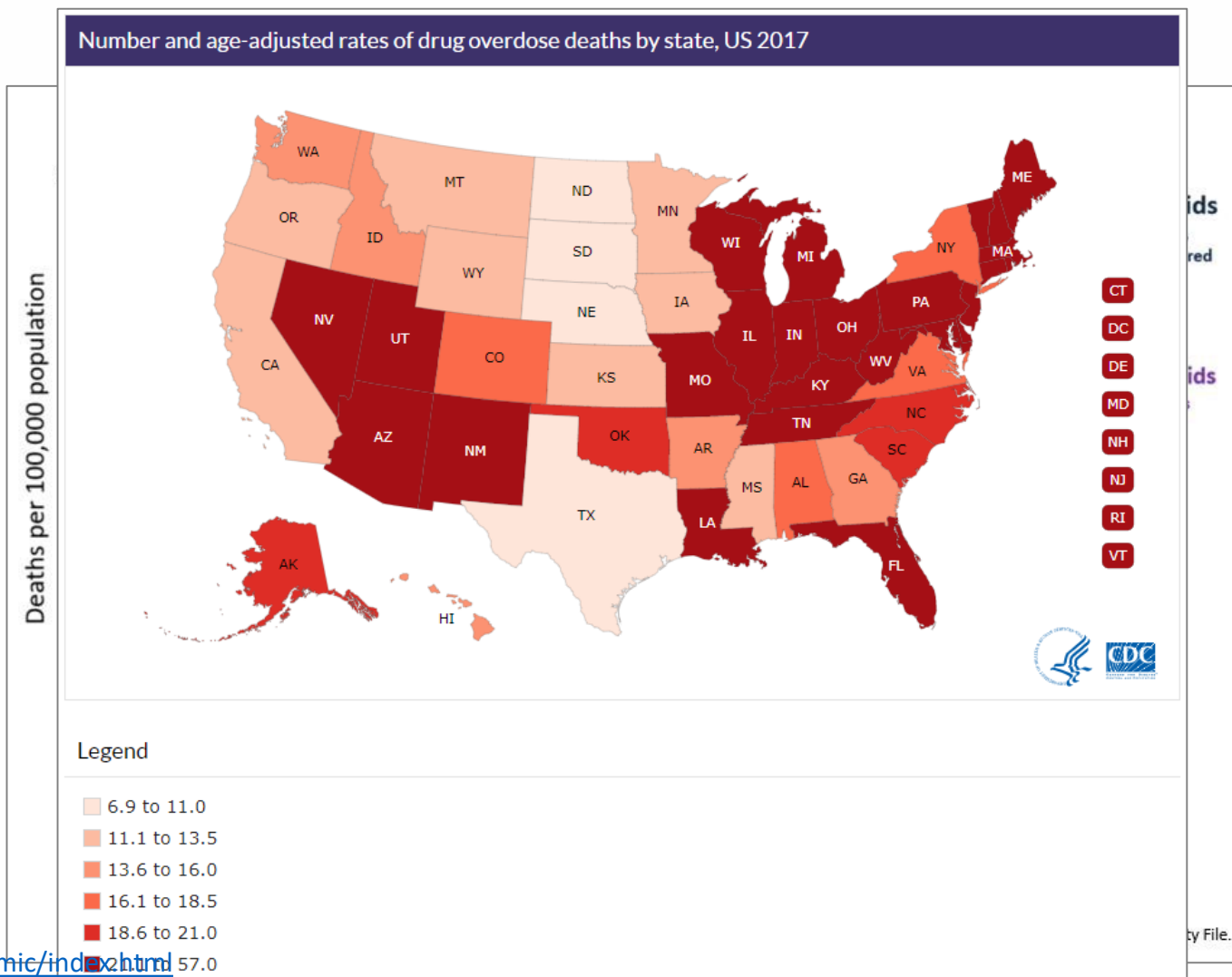
Opioid Epidemic - US



Opioid Epidemic - US

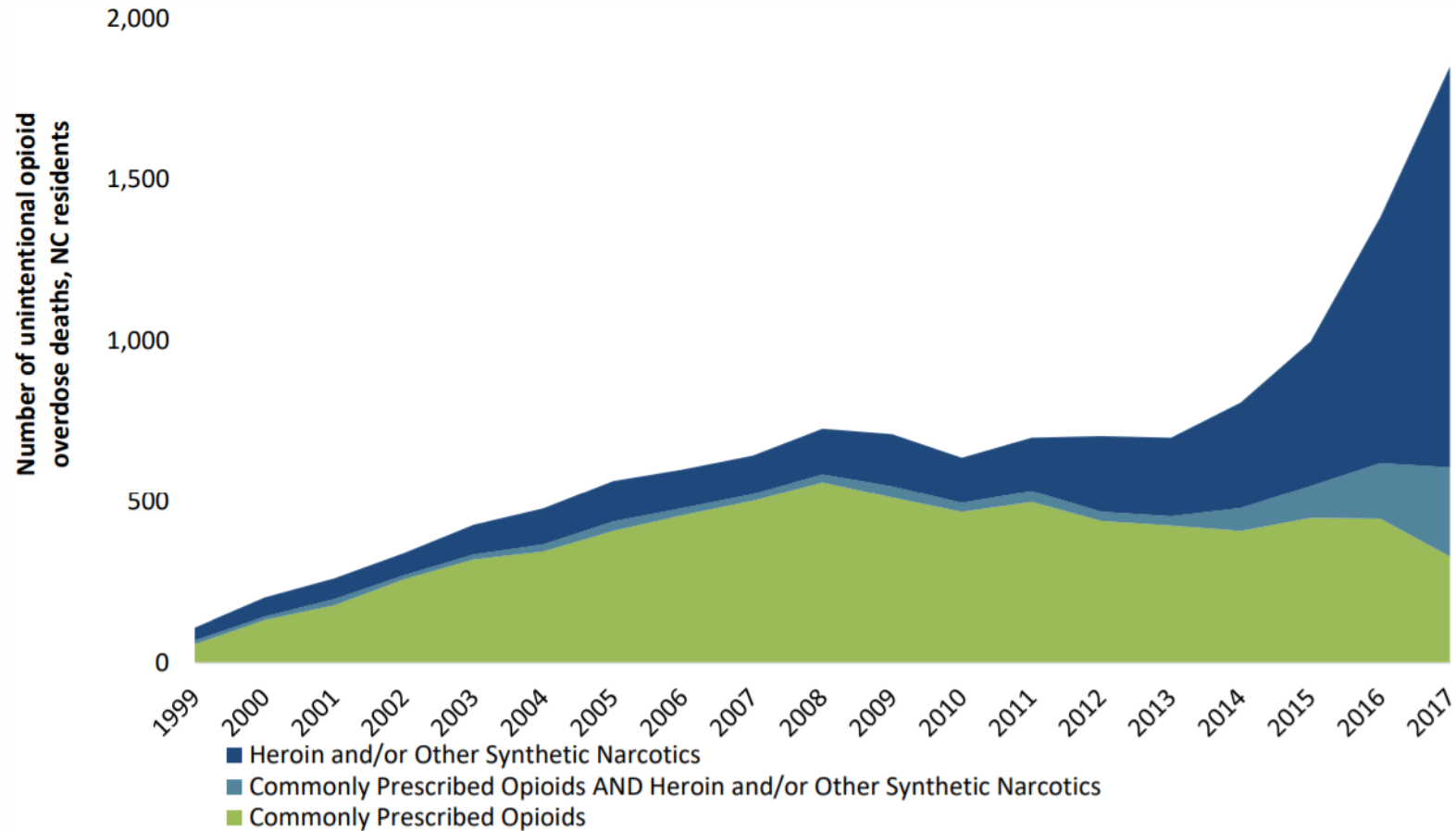


Opioid Epidemic - US



<https://www.cdc.gov/drugoverdose/epidemic/index.html>
<https://www.cdc.gov/drugoverdose/data/statedeaths.html>

Opioid Epidemic – North Carolina



Opioid Epidemic – What’s Next?

Overdoses among persons using stimulants?

- Fentanyl contamination of other drugs

Morbidity and Mortality Weekly Report

TABLE 3. Annual number and age-adjusted rate of drug overdose deaths* involving cocaine[†] and psychostimulants with abuse potential,^{§,¶} by sex, age, race and Hispanic origin,** urbanization level,^{††} and selected states^{§§} — United States, 2015 and 2016

| Decedent characteristic | Cocaine | | | | | | Psychostimulants with abuse potential | | | | | |
|-------------------------|---------|------|--------|------|--|------------------|---------------------------------------|------|-------|------|--|------------------|
| | 2015 | | 2016 | | Change from 2015 to 2016 ^{¶¶} | | 2015 | | 2016 | | Change from 2015 to 2016 ^{¶¶} | |
| | No. | Rate | No. | Rate | Absolute rate change | % Change in rate | No. | Rate | No. | Rate | Absolute rate change | % Change in rate |
| All | 6,784 | 2.1 | 10,375 | 3.2 | 1.1*** | 52.4*** | 5,716 | 1.8 | 7,542 | 2.4 | 0.6*** | 33.3*** |

Opioid Epidemic – What’s Next?

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Morbidity and Mortality Weekly Report

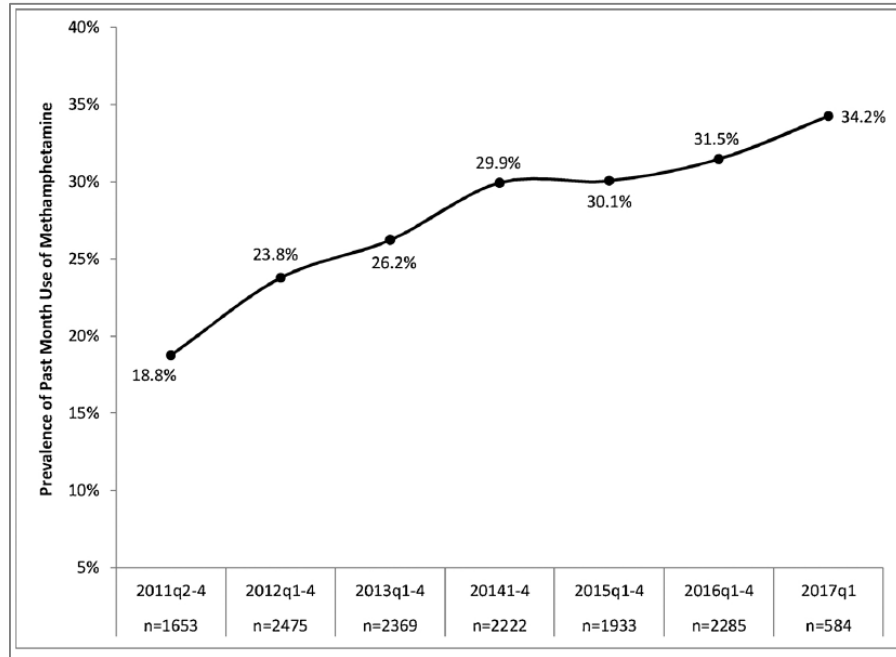
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Opioid Epidemic – What’s Next?

Increasing methamphetamine use

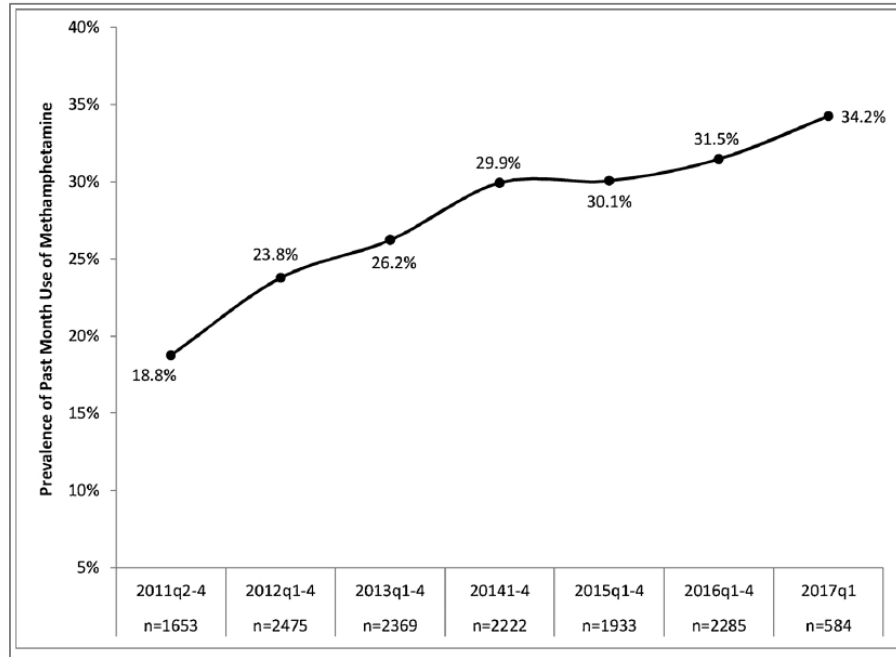
The New York Times
Meth, the Forgotten Killer, Is Back. And It’s Everywhere.



Opioid Epidemic – What's Next?

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Outline

- Quick take on opioid crisis
- **Infections of concern to people who inject drugs**
- Epidemiology of infective endocarditis
 - Recent data on NC
- Prevention strategies and harm reduction

Skin and Soft Tissue Infections

Cellulitis

Abscess

Necrotizing
Fasciitis



Cellulitis and Abscess

- Common
 - Up to 65% of PWID in past-year
- Associated with injecting “under the skin”



Pathogens

Staphylococcus aureus
("Staph"), including **MRSA**

Requires special consideration
of antibiotic choice

Streptococci

...but think about other
exposures

Necrotizing Fasciitis

- Rare but severe
- Characteristic findings:
 - Dusky skin, excessive pain on exam, bullae
- Associated with black tar heroin use
 - *Clostridium spp.*, but others possible
- Needs prompt emergency care



Skin and Soft Tissue Infections

- Attempts at self-treatment



“It got to the point where it was just so big and I kept trying to pop it myself. I was stickin’ needles in there sucking the juice out and trying to get rid of it myself for weeks and I just couldn’t do it.” (Participant 12)

- Delayed presentation to care



*“[I]f you’re admitted you’re going to end up being dope-sick from withdrawal because you’re stuck in the hospital, you can’t cop no dope. They’re not just going to give you **methadone** if you say, ‘I’m a **heroin addict**.’ ‘Okay, well we’re going to admit you and give you **methadone**.’ They don’t do that.” (Participant 9)*

- Concern for progression...

Other Severe Infections

- Endocarditis
- Osteomyelitis
- Septic arthritis
- Spine infections



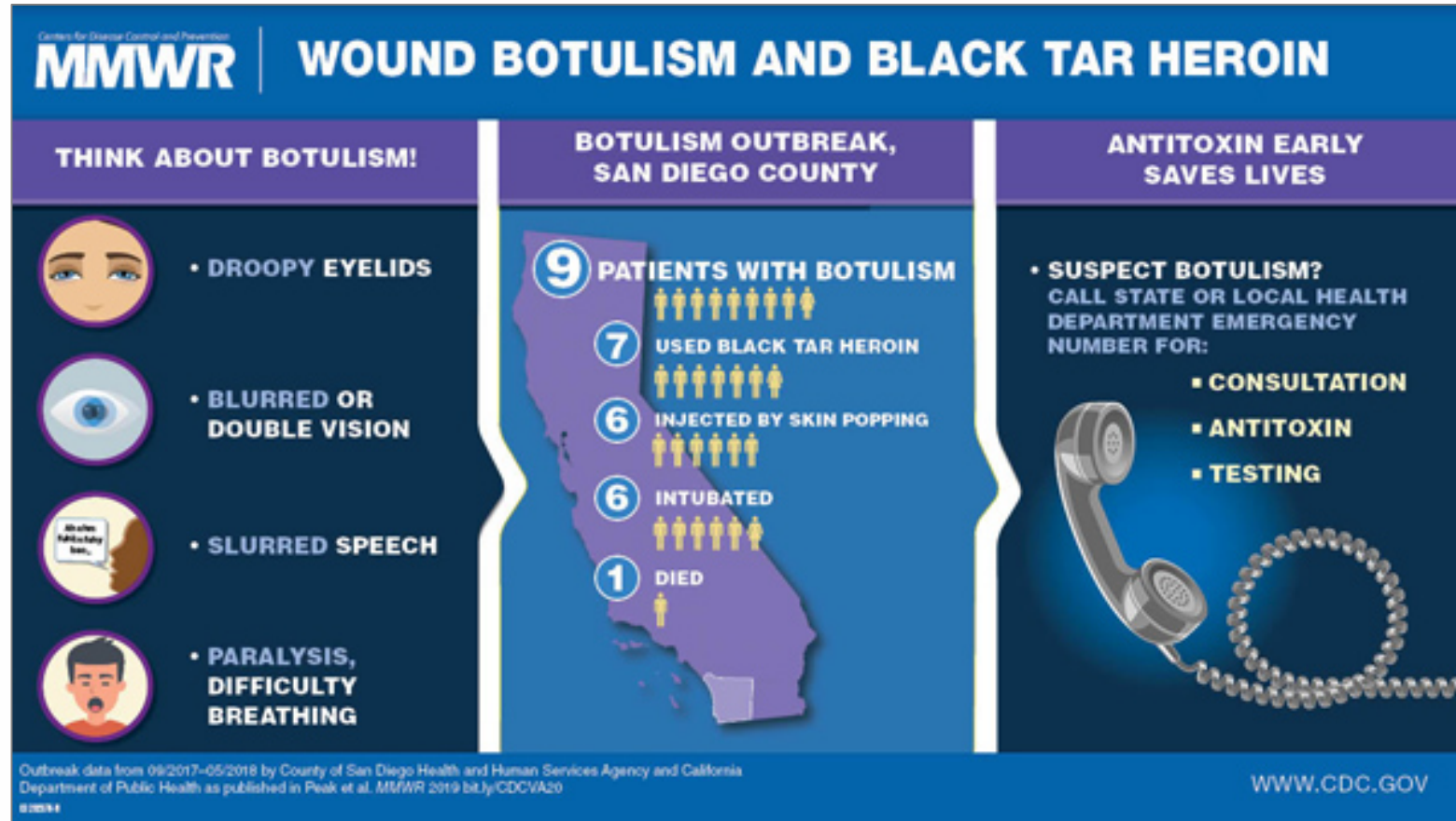
Other Severe Infections

EXHIBIT 1

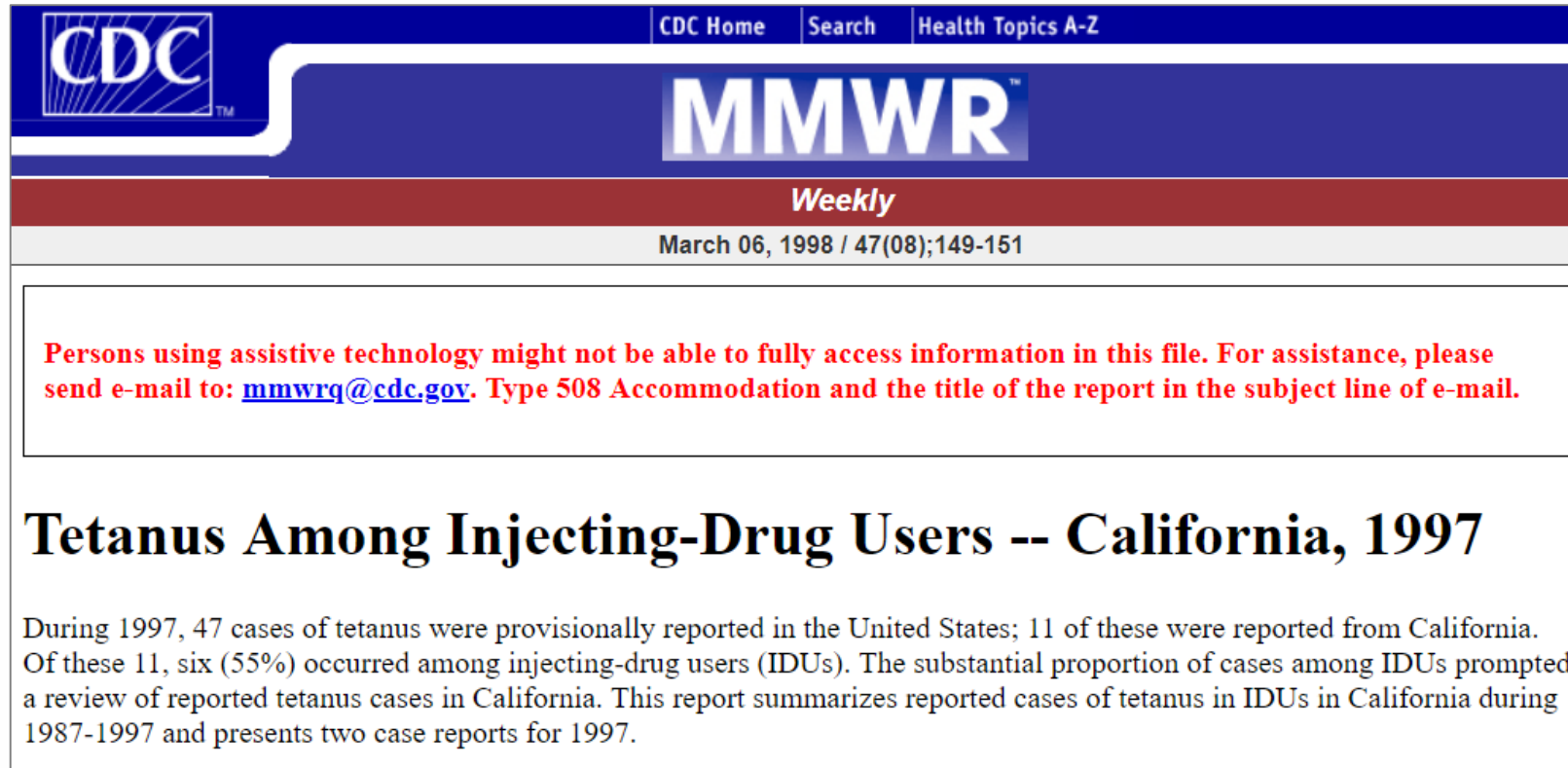
National estimates of hospitalizations related to opioid abuse/dependence and associated infections

| | Number of hospitalizations | |
|---|----------------------------|---------------------------------------|
| | 2002 (N = 36,523,831) | 2012 ^a (N = 36,484,846) |
| Opioid abuse/dependence | 301,707 | 520,275**** |
| Opioid abuse/dependence with infection ^b | 3,421 | 6,535**** |
| Endocarditis | 2,077 | 3,035*** |
| Osteomyelitis | 458 | 985**** |
| Septic arthritis | 729 | 1,940**** |
| Epidural abscess | 411 | 1,085**** |

Botulism



Tetanus



The image shows a screenshot of the CDC MMWR Weekly website. At the top left is the CDC logo. To its right are navigation links: "CDC Home", "Search", and "Health Topics A-Z". Below these is a large blue banner with "MMWR" in white, and "Weekly" in white on a red background below it. Underneath is a grey bar with the date "March 06, 1998 / 47(08);149-151". A red-bordered box contains a red text notice: "Persons using assistive technology might not be able to fully access information in this file. For assistance, please send e-mail to: mmwrq@cdc.gov. Type 508 Accommodation and the title of the report in the subject line of e-mail." Below this is the main title "Tetanus Among Injecting-Drug Users -- California, 1997" in bold black font. The main text below the title reads: "During 1997, 47 cases of tetanus were provisionally reported in the United States; 11 of these were reported from California. Of these 11, six (55%) occurred among injecting-drug users (IDUs). The substantial proportion of cases among IDUs prompted a review of reported tetanus cases in California. This report summarizes reported cases of tetanus in IDUs in California during 1987-1997 and presents two case reports for 1997."

Viral Infections (very abbreviated)



- Hepatitis A
 - Recent outbreaks among people injecting drugs
 - Vaccine-preventable
- Hepatitis B
 - Vaccinate – or consider confirming immunity
- Hepatitis C
 - Guidelines endorse treating all persons
 - Success in people injecting drugs
 - Treatment as prevention
- HIV
 - Outbreaks among PWID
 - PrEP indicated

...And Some Mimics

- Vasculitis
 - Levamisole (ANCA+)
- Cotton fever
 - Sepsis syndrome with injecting-fever and leukocytosis
 - Sterile cultures
- Drug effects
 - Serotonergic
 - Autonomic



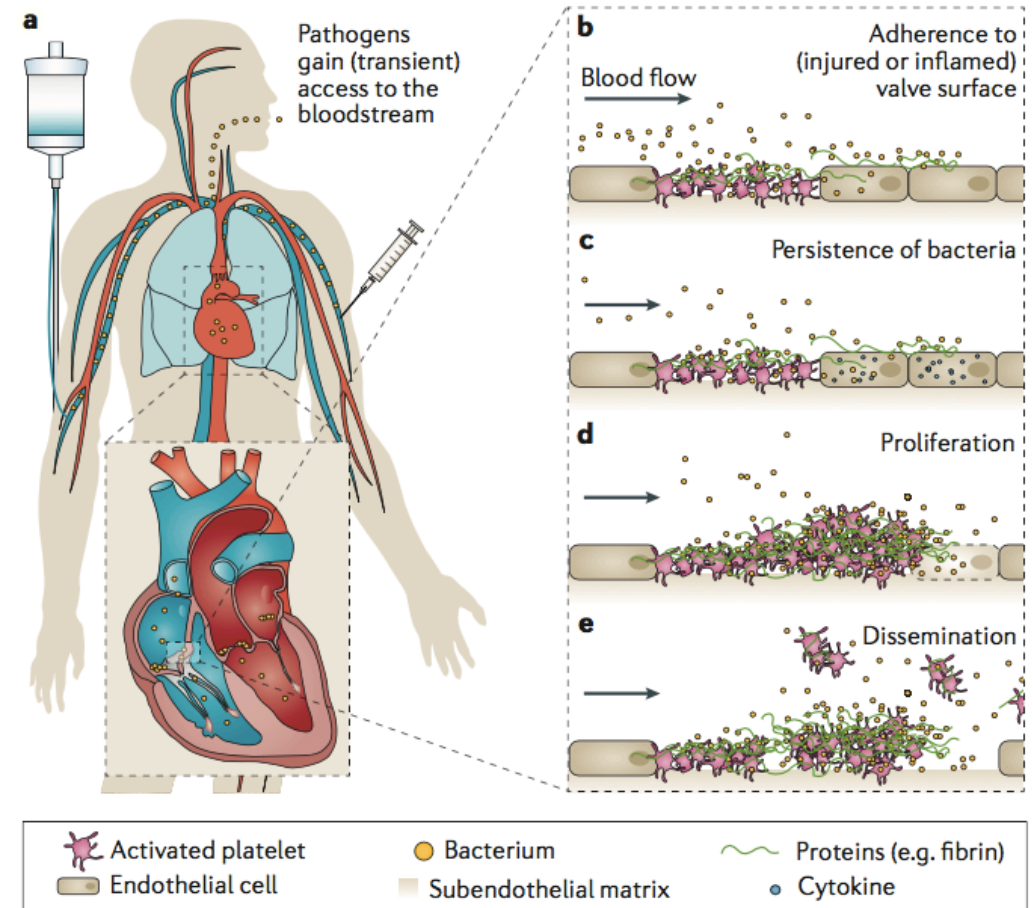


Outline

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- **Epidemiology of infective endocarditis**
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What is Infective Endocarditis?

- Infection of heart valves by bacteria or fungus
- Commonly: older persons with degeneration of valves



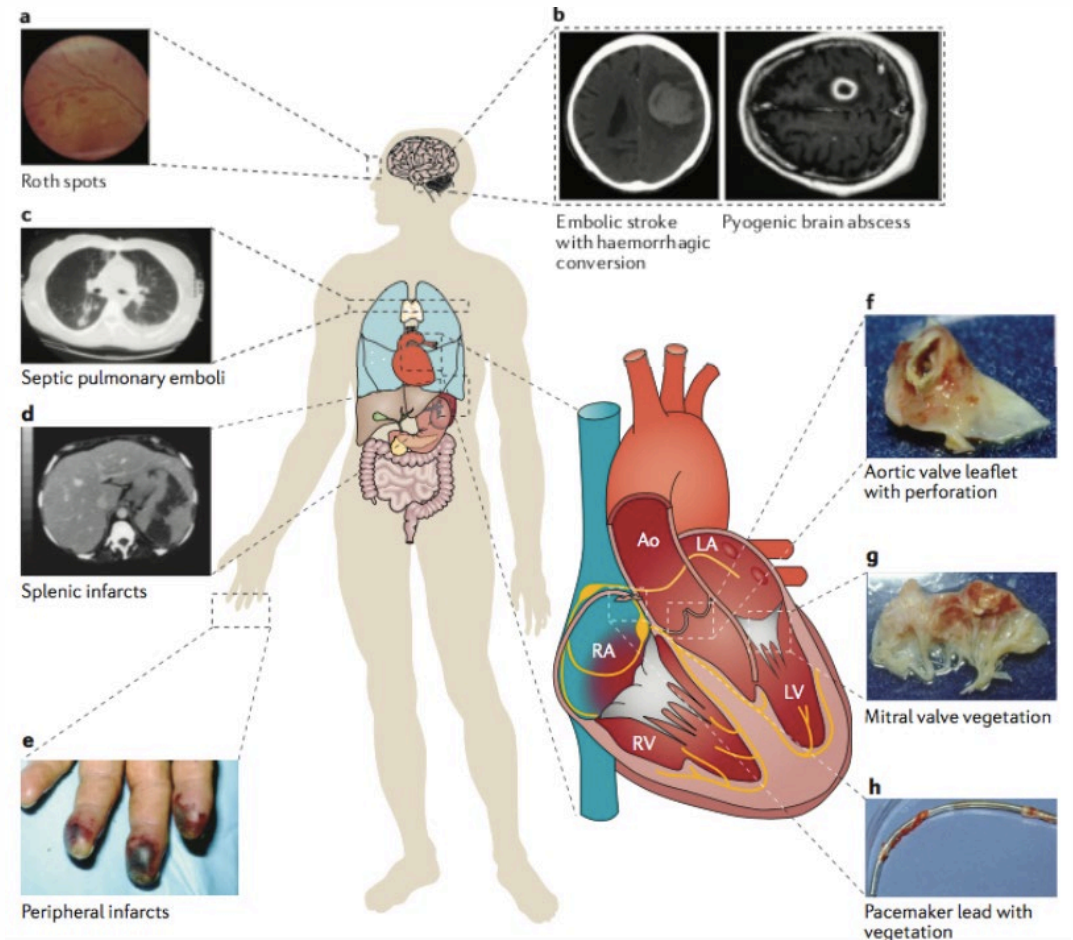
What is Infective Endocarditis?

Presentation

- Nonspecific and mild
- ... Or overt and severe

Management

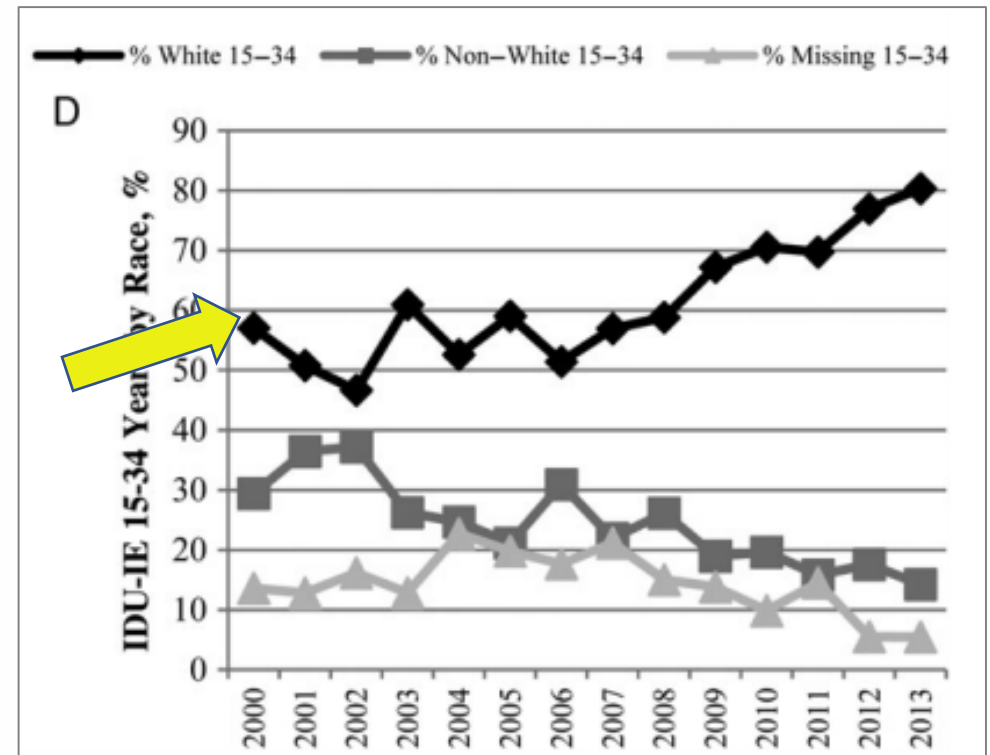
- 6 weeks of IV antibiotics
- Surgical replacement of valve
 - Estimated 25-60%



What's going on with endocarditis?

From 2000 to 2013:

- 2-fold rise in injection drug-associated endocarditis
 - Primarily in young, white patients



Well, what's going on in North Carolina?

Annals of Internal Medicine

ORIGINAL RESEARCH

Trends in Drug Use–Associated Infective Endocarditis and Heart Valve Surgery, 2007 to 2017

A Study of Statewide Discharge Data

Asher J. Schranz, MD; Aaron Fleischauer, PhD; Vivian H. Chu, MD, MHS; Li-Tzy Wu, RN, ScD, MA; and David L. Rosen, MD, PhD

Background: Drug use–associated infective endocarditis (DUA-IE) is increasing as a result of the opioid epidemic. Infective endocarditis may require valve surgery, but surgical treatment of DUA-IE has invoked controversy, and the extent of its use is unknown.

Objective: To examine hospitalization trends for DUA-IE, the proportion of hospitalizations with surgery, patient characteristics, length of stay, and charges.

Design: 10-year analysis of a statewide hospital discharge database.

Setting: North Carolina hospitals, 2007 to 2017.

Patients: All patients aged 18 years or older hospitalized for IE.

Measurements: Annual trends in all IE admissions and in IE hospitalizations with valve surgery, stratified by patients' drug use status. Characteristics of DUA-IE surgical hospitalizations, including patient demographic characteristics, length of stay, disposition, and charges.

Results: Of 22 825 IE hospitalizations, 2602 (11%) were for DUA-IE. Valve surgery was performed in 1655 IE hospitalizations

(7%), including 285 (17%) for DUA-IE. Annual DUA-IE hospitalizations increased from 0.92 to 10.95 and DUA-IE hospitalizations with surgery from 0.10 to 1.38 per 100 000 persons. In the final year, 42% of IE valve surgeries were performed in patients with DUA-IE. Compared with other surgical patients with IE, those with DUA-IE were younger (median age, 33 vs. 56 years), were more commonly female (47% vs. 33%) and white (89% vs. 63%), and were primarily insured by Medicaid (38%) or uninsured (35%). Hospital stays for DUA-IE were longer (median, 27 vs. 17 days), with higher median charges (\$250 994 vs. \$198 764). Charges for 282 DUA-IE hospitalizations exceeded \$78 million.

Limitation: Reliance on administrative data and billing codes.

Conclusion: DUA-IE hospitalizations and valve surgeries increased more than 12-fold, and nearly half of all IE valve surgeries were performed in patients with DUA-IE. The swell of patients with DUA-IE is reshaping the scope, type, and financing of health care resources needed to effectively treat IE.

Primary Funding Source: National Institutes of Health.

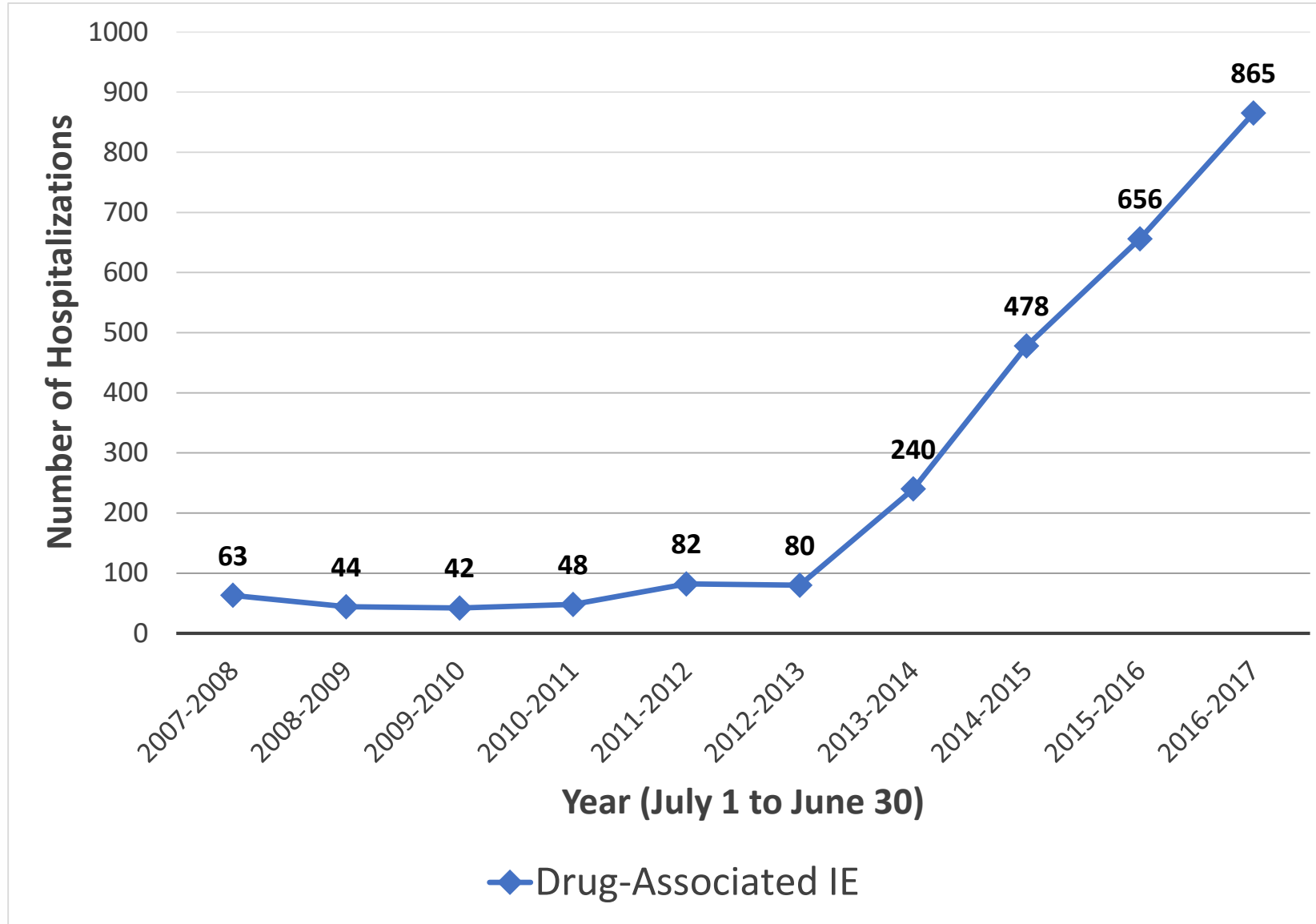
Ann Intern Med. doi:10.7326/M18-2124

For author affiliations, see end of text.

This article was published at Annals.org on 4 December 2018.

Annals.org

Infective Endocarditis Hospitalizations



Well, what about surgery?

Heart Valve Replacement in People Who Use Drugs

- Concerns of heart valve replacement:
 - Reinfection of prosthetic valve
 - Repeated sternotomies
 - Technically difficult surgeries, increasingly high-risk
 - Absence of consensus in surgical community

Well, what about surgery?

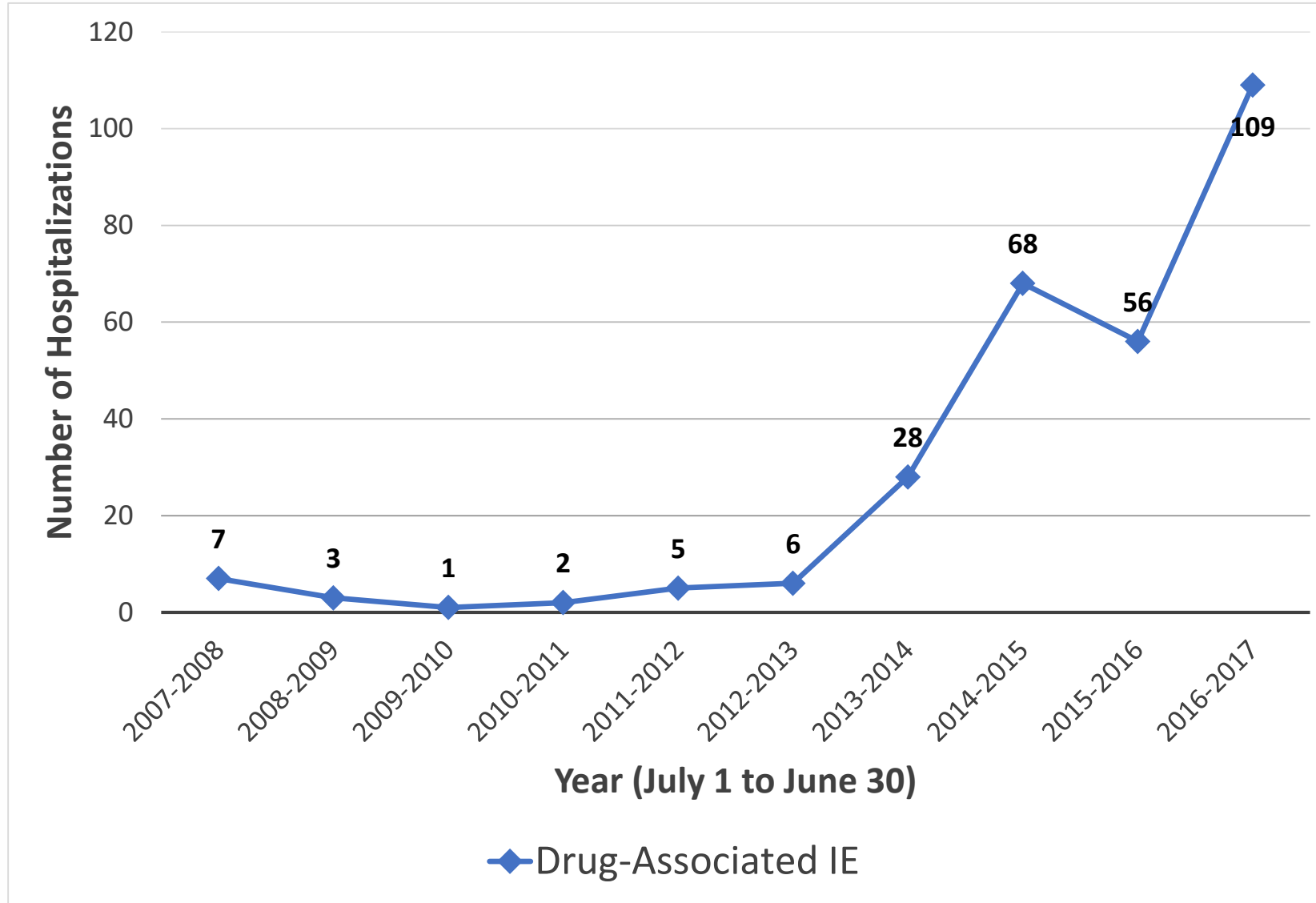




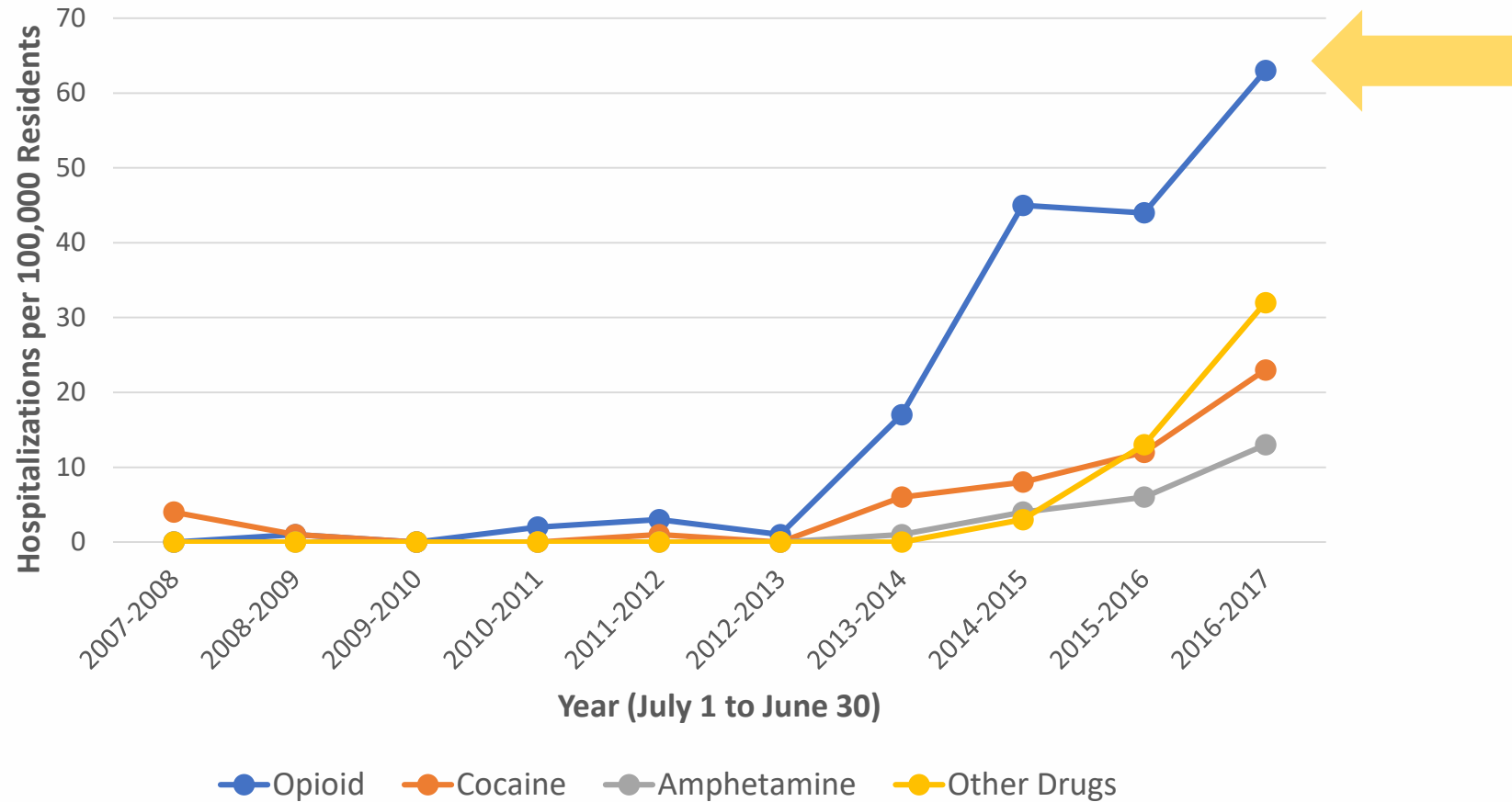
Well, what about surgery?

Antibiotics cleared the infection that initially led her to the hospital, but she ended up needing surgery two months later. Her mitral valve was so damaged that she had begun showing signs of heart failure. Dr. Martinez “The way he put it was, ‘You relapse and end up with another infection, we won’t treat you again,’” Mr. Mignogna said.

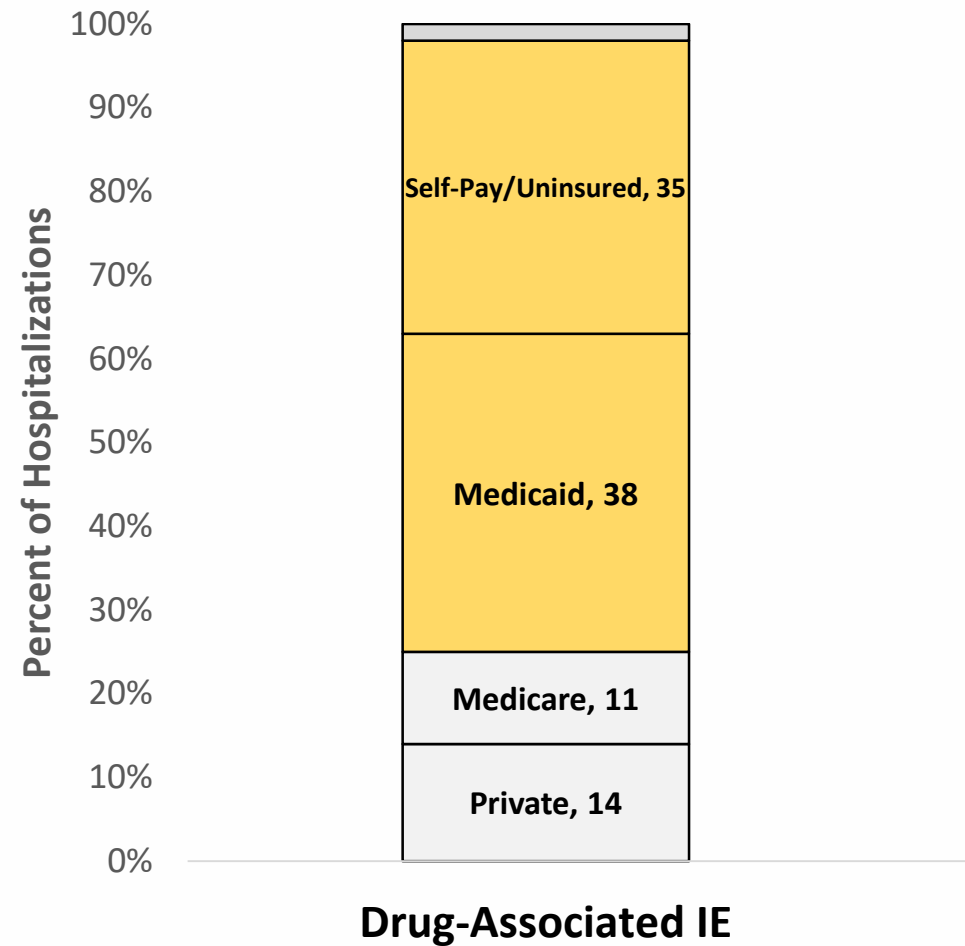
IE Hospitalizations with Surgery



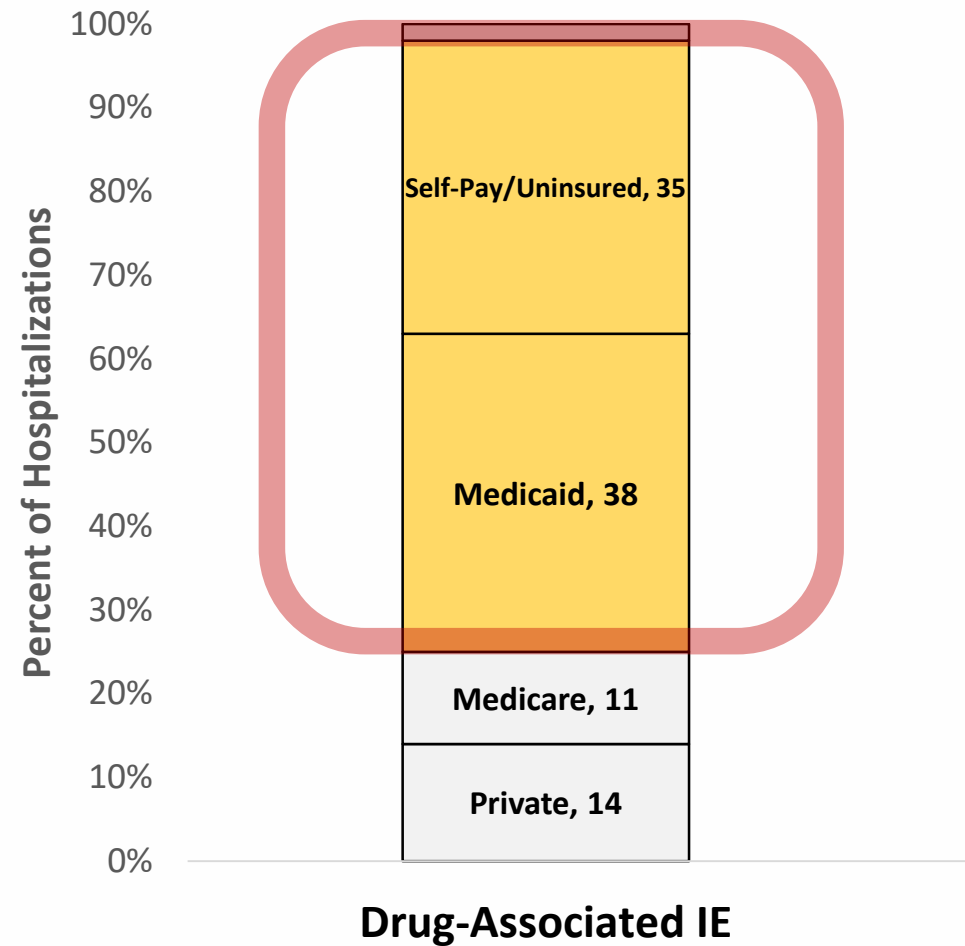
Endocarditis Surgeries Trends, by Drug



Endocarditis Surgeries: Insurance Status



Endocarditis Surgeries: Insurance Status





Endocarditis: Length of Stay and Hospital Charges

- Median length of stay **27 days**
- Median hospital charges **\$250,994** per hospitalization



State of Endocarditis in NC

- Drug-related endocarditis is sharply increasing
 - Hospitalizations have risen >12-fold
- Driven by misuse of opioids and, increasingly, other drugs
- Long and expensive hospitalizations

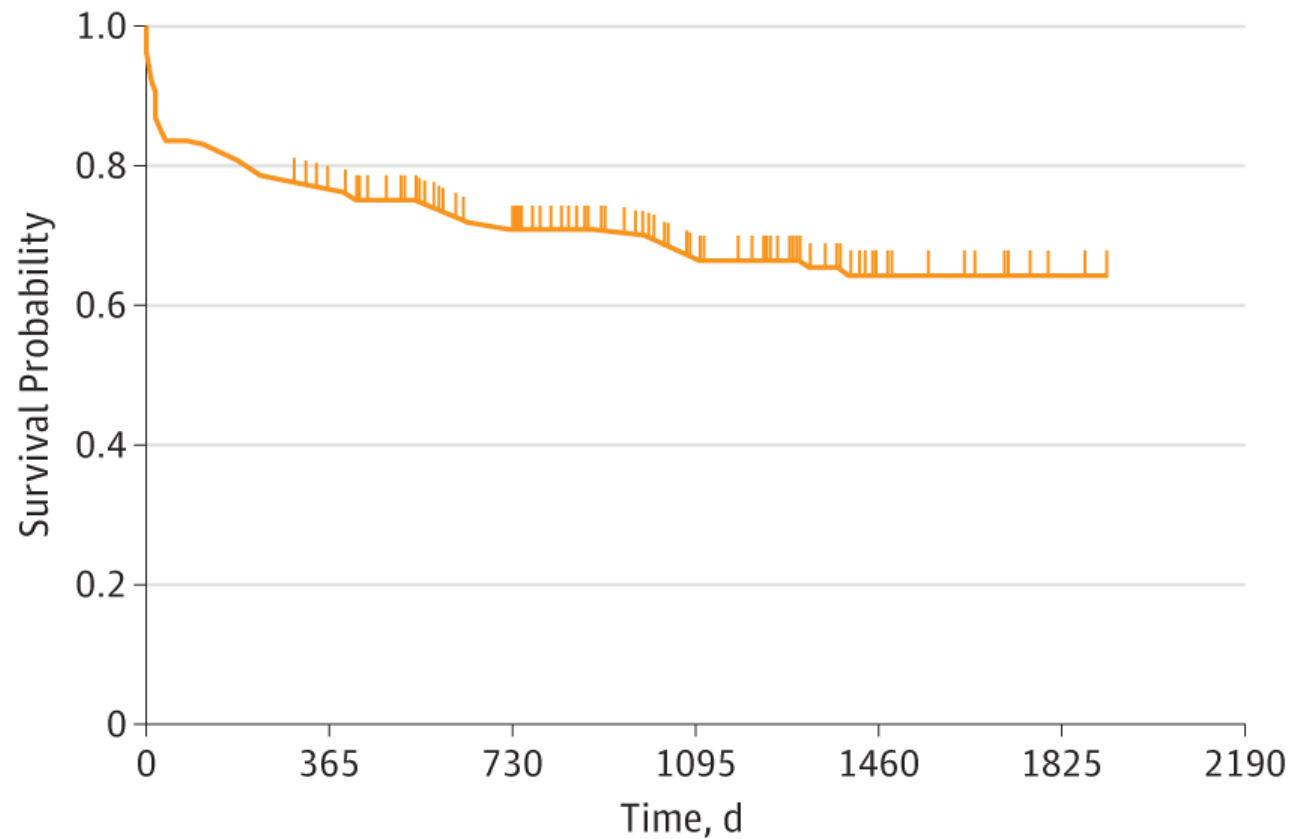


Challenges in Management

- Underlying addiction is not addressed
 - Medication for opioid use disorder is rarely started
 - In-hospital drug use
 - Against medical advice discharge
 - 13-22%
- Missed opportunity for harm reduction

Long-Term Outcomes

Overall survival of PWID with first episode IE



Rodger L, JAMA Open 2018.



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Medications for Opioid Use Disorder

- Detoxification alone ineffective (60-81% relapse in one year)

| Medication | Mechanism of Action | Notes |
|---------------|------------------------|---|
| Methadone | Full opioid agonist | Must be delivered in Opioid Treatment Program (aka methadone clinic) |
| Buprenorphine | Partial opioid agonist | -Delivery in primary care settings – need “X” waiver -In-hospital use by anyone -Precipitated withdrawal risk |
| Naltrexone | Opioid antagonist | -IM injection q28 days -Precipitated withdrawal risk |

- Treatments for methamphetamine or cocaine - tougher

Gossop M, Br J Psychiatry 1989.

Broers B, Drug Alcohol Depend 2000.

Gossop M, Addiction 2002.



Immunization

Hepatitis A

- Hepatitis A alone: two doses
- Combined Hepatitis A/B: three doses

Hepatitis B

- Conventional
 - Three doses: 0, 1 and 6 months
- Novel adjuvant
 - **Two doses:** 0 and 1 month

Tetanus

- Same as general population (every 10 years)

All are safe for immunocompromised individuals

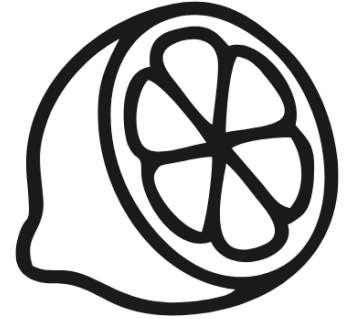
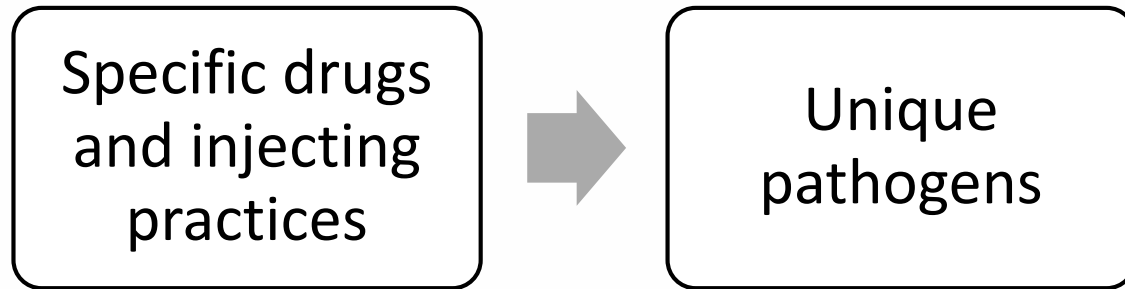


What's the process?



What's the process?

- Dissolving solids
- Licking needles



What's the process?

“Sharing drugs”

- Can mean different things



Cleaning injection equipment



- Avoid reuse if possible

How To Clean Your Syringes

- If possible, always use a new, sterile syringe* and never share any injection equipment.
- A disinfected syringe is not as good as a new, sterile syringe, but it can greatly reduce your risk for HIV and viral hepatitis.
- Wash your hands before cleaning your syringes.
- You will need three clean containers (cup, bowl, jar, etc.), clean water, and bleach.


To clean a syringe correctly, you must do **all nine steps below**:

A. Rinse with clean water



1. 
In first container, fill up syringe (rig) with clean water
2. 
Tap or shake syringe for 30 seconds.
3. 
Discard water from syringe.

REPEAT steps 1, 2, and 3 at least once or until water in syringe is clear (no blood).

B. Disinfect with pure bleach

4. 
In second container, fill up syringe (rig) with bleach.
5. 
Tap or shake syringe for 30 seconds.
6. 
Discard bleach from syringe.

C. Rinse with clean water


7. 
In third container, fill up syringe (rig) with new, clean water.
8. 
Tap or shake syringe for 30 seconds.
9. 
Discard water from syringe.

Because viral hepatitis can survive on surfaces (even if you can't see blood), cookers (like a spoon) should also be cleaned with water and bleach.

For more information please visit www.cdc.gov/hiv

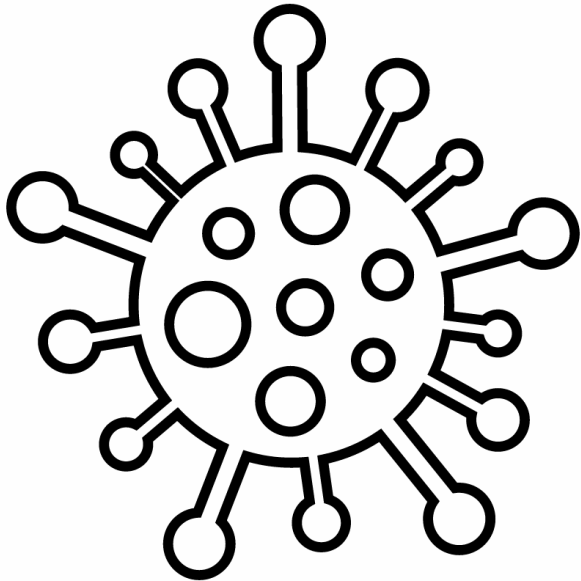
* In this fact sheet, the term syringe includes a syringe and needle as a single unit.

National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention
Division of HIV/AIDS Prevention

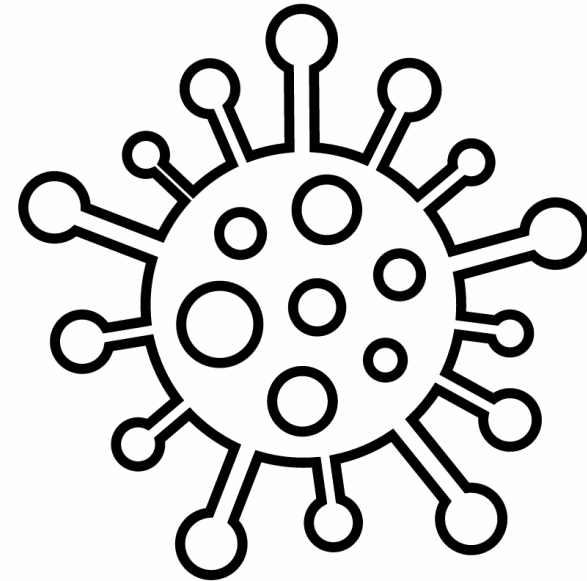


Transmission Risk

HIV



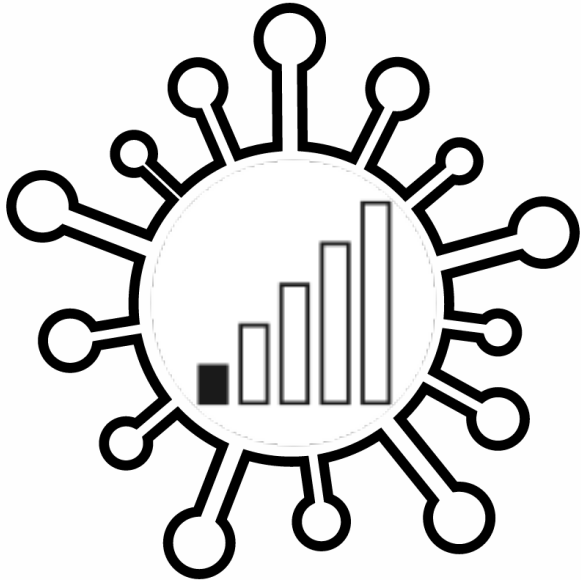
HCV



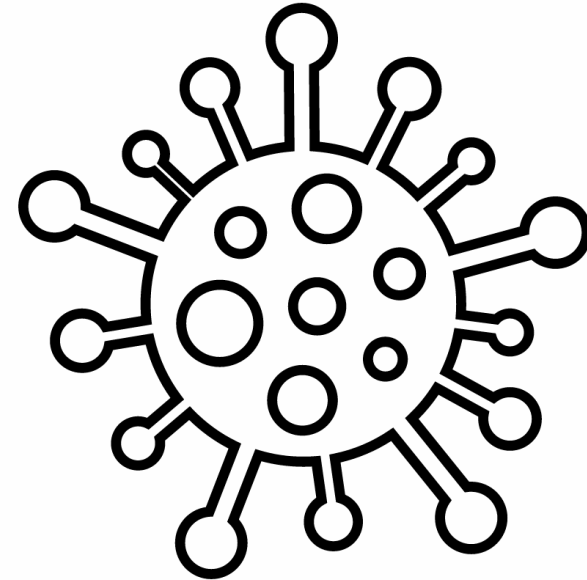
Transmission Risk

HIV

1 of ~50-200 injection events



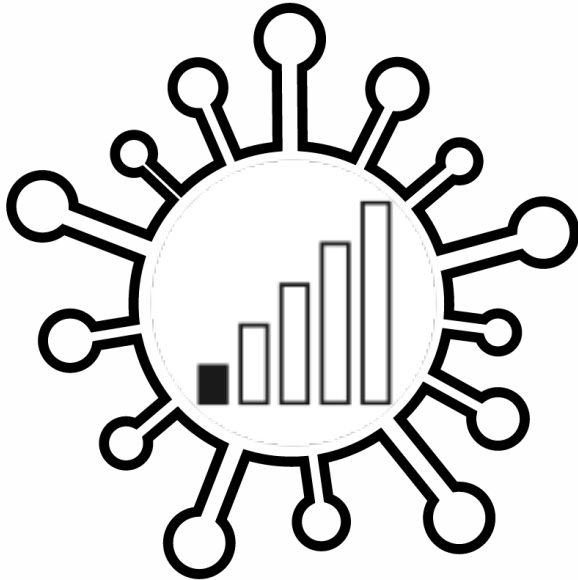
HCV



Transmission Risk

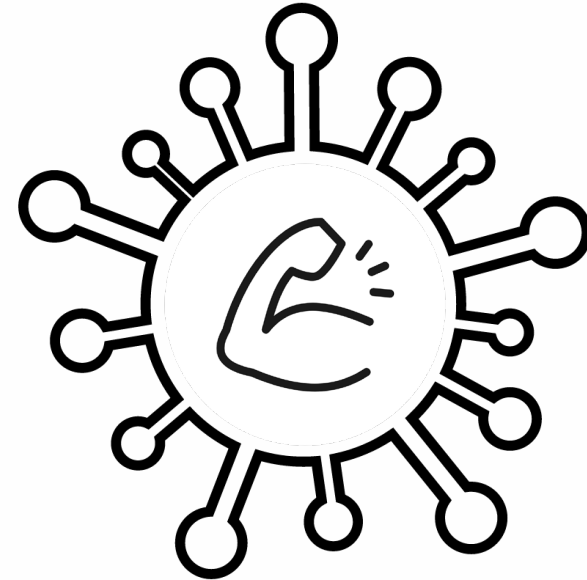
HIV

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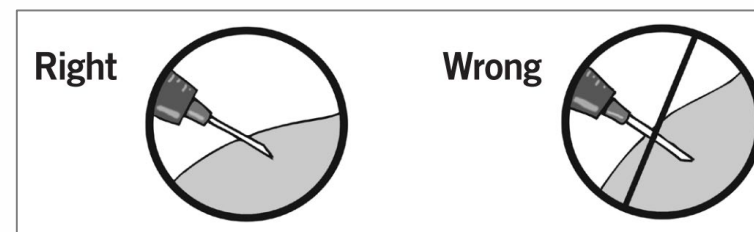
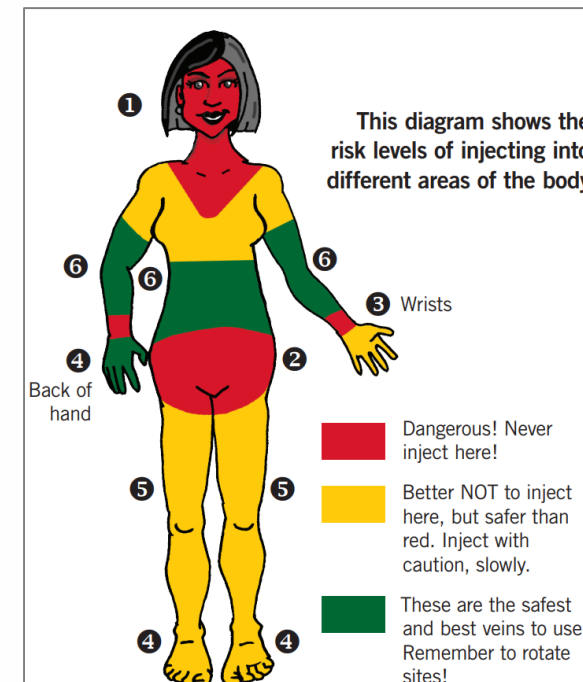
HCV

Persists for long periods on inanimate surfaces



Safer Injection Technique

- Aseptic technique
- Needles – small (higher gauge), sharp, inserted bevel up



Where to learn more?



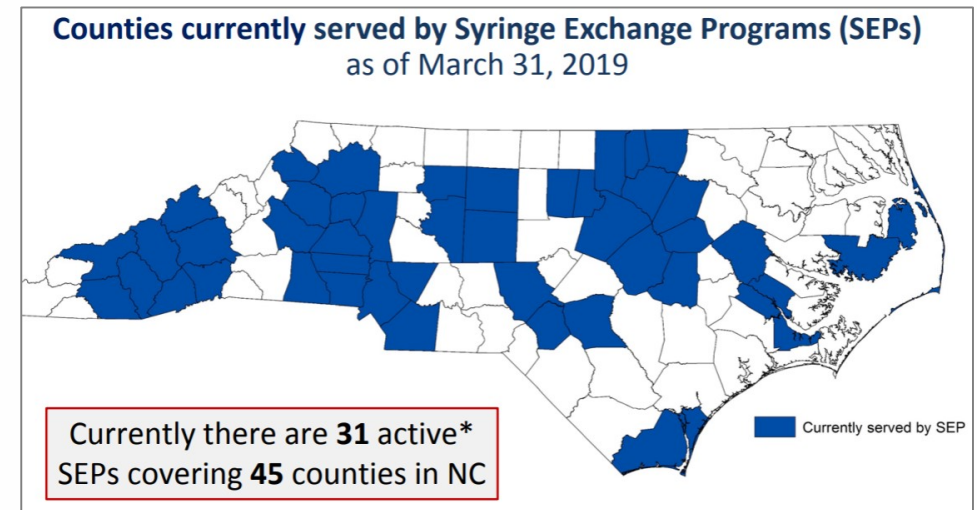
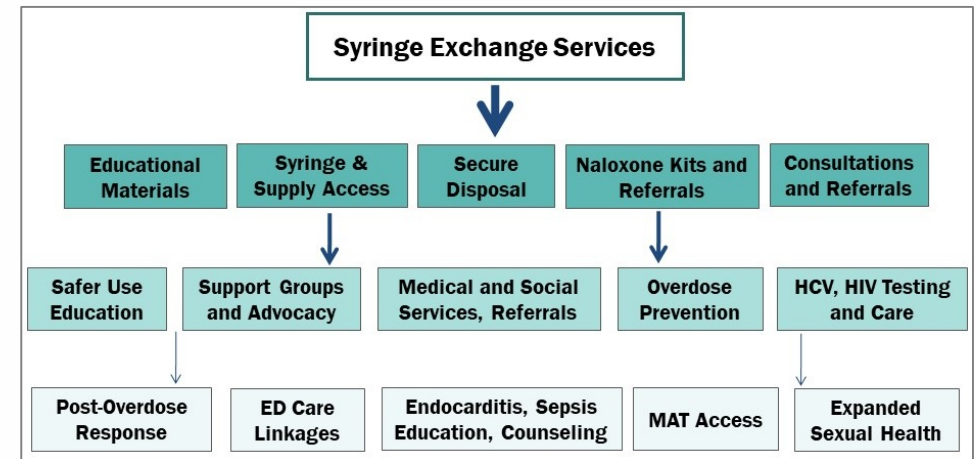
- *Getting Off Right* (Harm Reduction Coalition)
- *Sharp Shooters* (CATIE)
- *Safer Injecting* (Merchants Quay Ireland)

Words matter

| Words to Avoid | Words to use |
|---|---|
| Addict | Person with substance use disorder |
| Alcoholic | Person with alcohol use disorder |
| Drug problem, drug habit | Substance use disorder |
| Drug abuse | Drug misuse, harmful use |
| Drug abuser/junkie | Person with substance use disorder |
| Drug user | Person who uses drugs/injects drugs |
| Clean | Abstinent, not actively using |
| Dirty | Actively using |
| A clean drug screen | Testing negative for substance use |
| A dirty drug screen | Testing positive for substance use |
| Former/reformed addict/alcoholic | Person in recovery/person in long-term recovery |
| Opioid replacement/methadone maintenance | Medication-assisted treatment |

Syringe Exchange Programs

- Legal in NC as of July 2016
- Active list with contacts maintained at NC DHHS website
- Services offered:
 - Sterile injecting equipment
 - Secure disposal of used equipment
 - Naloxone
 - Education
 - Many other services





Search All DHHS Websites...

[NC.GOV](#) [AGENCIES](#) [JOBS](#) [SERVICES](#)

- [Home](#)
- [Assistance](#) ▾
- [Divisions](#) ▾
- [Documents](#)
- [Providers](#) ▾
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- [About](#) ▾
- [Contact](#) ▾

[NCDHHS](#) » [Divisions](#) » [Public Health](#) » [North Carolina Safer Syringe Initiative](#) » Syringe Exchange Programs in North Carolina

Syringe Exchange Programs in North Carolina

AIDS Leadership Foothills-area Alliance (ALFA) Foothills-area Harm Reduction Mission (the FARM)
Fixed; mobile; peer-based; integrated
Liz
(828) 999-0055
wecare@thefarmnc.org
www.thefarmnc.org [↗](#)
Fixed-site exchange at "Steve's Place":
211 NC-127 SE Hickory, NC 28602
Mobile exchange available Tuesdays.
Services available on the first Tuesday of each month (look for the Big Red Mobile Unit) at:
241 Northview Plaza, North Wilkesboro, NC 28659

- [North Carolina Safer Syringe Initiative](#)
- [Syringe Exchange Programs In North Carolina](#)
- [Syringe Exchange FAQs](#)
- [Quick Answers for Law Enforcement Personnel](#)
- [Participant Cards and Limited Immunity](#)
- [Resources for Providers](#)
- [Preventing Transmission of Infections](#)

Search "NC DHHS Syringe Exchange"



Syringe Exchange Programs in North Carolina

AIDS Leadership Foothills-area Alliance (ALFA) Foothills-area Harm Reduction Mission (the FARM)

Fixed; mobile; peer-based; integrated

Liz

(828) 999-0055

wecare@thefarmnc.org

www.thefarmnc.org

Fixed-site exchange at "Steve's Place":

211 NC-127 SE Hickory, NC 28602

Mobile exchange available Tuesdays.

Services available on the first Tuesday of each month (look for the Big Red Mobile Unit) at:

241 Northview Plaza, North Wilkesboro, NC 28659

North Carolina Safer Syringe Initiative

Syringe Exchange Programs In North Carolina

[Syringe Exchange FAQs](#)

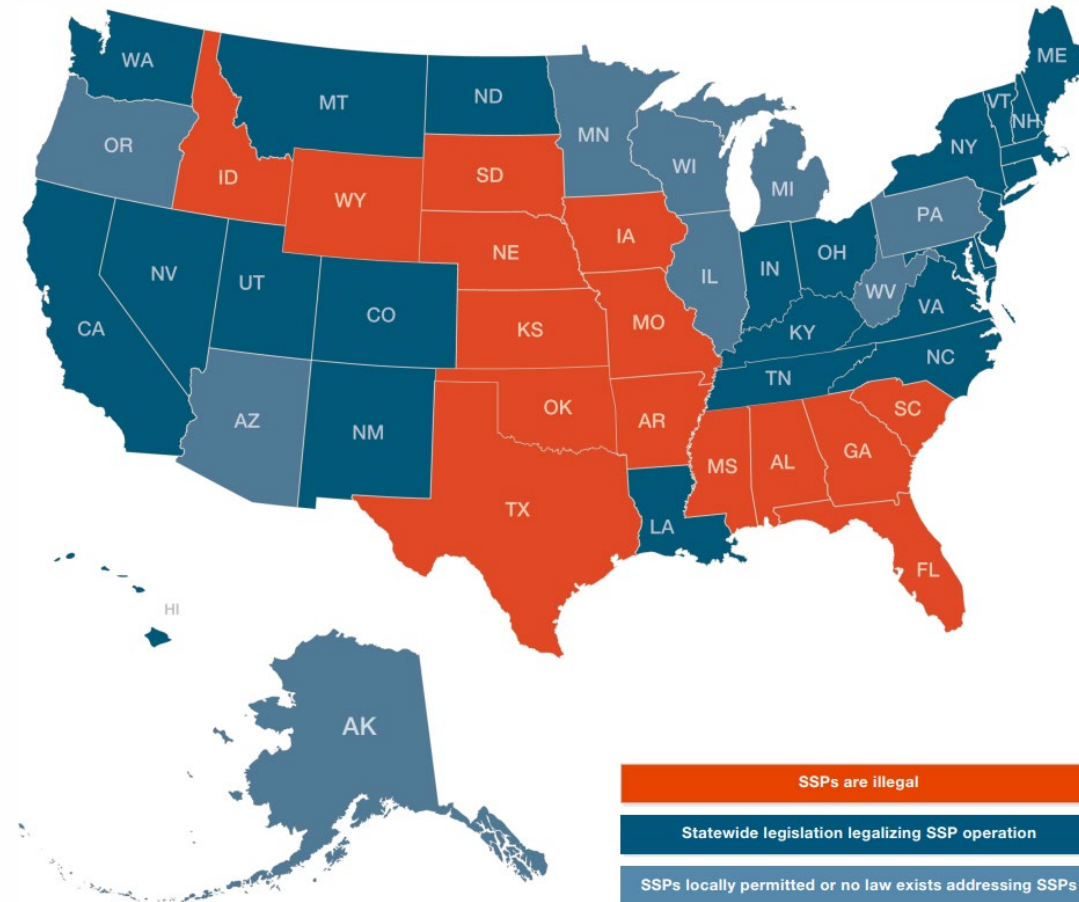
[Quick Answers for Law Enforcement Personnel](#)

[Participant Cards and Limited Immunity](#)

[Resources for Providers](#)

[Preventing Transmission of Infections](#)

Syringe Exchange Programs



[https://www.amfar.org/uploadedFiles/amfarorg/Articles/On The Hill/2017/15.pdf](https://www.amfar.org/uploadedFiles/amfarorg/Articles/On%20The%20Hill/2017/15.pdf)

On the Horizon? Supervised Drug Consumption Facilities

Some outcomes observed:

- Decreased syringe sharing
- Fewer overdoses
- Prevented HIV infections, and healthcare costs saved
- Decreased crime in surrounding area
 - *based on observational and modeling studies

Kennedy, Curr HIV/AIDS Rep 2017
Gostin, JAMA 2019

Curr HIV/AIDS Rep (2017) 14:161–183
DOI 10.1007/s11904-017-0363-y



THE SCIENCE OF PREVENTION (JD STEKLER AND J BAETEN, SECTION EDITORS)

Public Health and Public Order Outcomes Associated with Supervised Drug Consumption Facilities: a Systematic Review

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Abstract
Purpose of Review Supervised drug consumption facilities (SCFs) have increasingly been implemented in response to public health and public order concerns associated with illicit drug use. We systematically reviewed the literature investigating the health and community impacts of SCFs.
Recent Findings Consistent evidence demonstrates that SCFs mitigate overdose-related harms and unsafe drug use behaviours, as well as facilitate uptake of addiction treatment and other health services among people who use drugs (PWUD). Further, SCFs have been associated with improvements in public order without increasing drug-related crime. SCFs have also been shown to be cost-effective.
Summary This systematic review suggests that SCFs are effectively meeting their primary public health and order objectives and therefore supports their role within a continuum of services for PWUD. Additional studies are needed to better understand the potential long-term health impacts of SCFs and how innovations in SCF programming may help to optimize the effectiveness of this intervention.

Keywords Supervised drug consumption facilities · Supervised injection facilities · Illicit drug use · Harm reduction · Systematic review

Introduction
Illicit drug use remains a major global public health concern and, in particular, is a key driver of HIV/AIDS and overdose epidemics [1–4]. Public drug use and public disposal of syringes are also community concerns in various settings, particularly in inner-city neighbourhoods [5]. In an effort to mitigate these challenges, supervised drug consumption facilities (SCFs) have been established in a number of cities worldwide [6, 7]. SCFs are healthcare facilities that provide sterile equipment and a safe and hygienic space for people who use drugs (PWUD) to consume pre-obtained illicit drugs under the supervision of nurses or other trained staff [7]. SCFs are also referred to as drug consumption rooms and include supervised injection facilities (SIFs), which accommodate people who inject drugs

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On the Horizon? Supervised Drug Consumption Facilities



<https://www.buzzfeednews.com/article/azeenghorayshi/safe-injection-site-proposals-map>

Where to learn more?

- NC Injury and Violence Prevention Branch
 - Poisoning statistics
- NC DHHS Syringe Exchange Registry
- Harm Reduction Coalition
 - NCHRC.org
- CDC.gov
- PCSSnow.org (Buprenorphine waiver)



Conclusions

- Bacterial infections are common in people who inject drugs, and can range from mild to severe
- Be mindful of atypical infections in persons who inject drugs
 - Ask what drugs patients use and how they use them
- Harm reduction and addiction treatment are key elements of infection prevention

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