The Opioid-related Syndemic in Rural Northern New England: Findings from the DISCERNNE Study

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Disclosures

• No disclosures

• Views and interpretations are those of the speaker
  – do not necessarily reflect those of state partners or federal funding agencies (NIDA/CDC/SAMHSA/ARC).
The U.S. Opioid Epidemic Continues

![Graph showing the increase in opioid deaths per 100,000 standard population from 1999 to 2018.]

- Synthetic opioids other than methadone
- Natural and semisynthetic opioids
- Heroin
- Methadone

Hedegaard et al. 2020
Opioid Epidemic in Rural & Urban Communities

[Graph showing the increase in opioid deaths per 100,000 standard population from 1999 to 2017, with separate lines for Rural and Urban areas, indicating a significant increase.]
High Rate of Increase in Opioid-related Mortality in Rural Counties, 1999-2016

CDC, 2017, Rigg et al., 2018
HCV Incidence among persons aged ≤30
Kentucky, Tennessee, Virginia, & West Virginia, 2006–12

Zibbell et al. MMWR 2015
Syndemic: Interrelated Epidemics + Structurally-Marginalized Context

Policy, Resource and Risk Environment (aka Context)
• Area-level Deprivation/social capital
• Policy and cultural status of drug use
• Access to needed services
• CJ activity
• “Big events”

Singer, 1994; Rhodes et al., 2005; Nikolopoulos et al 2015; Perlman & Jordan, 2018.
Syndemic Outbreak in Scott County IN, 2014-15

A Cumulative HIV Diagnoses and Public Health Response

- Initial diagnosis
- Cluster identified
- Incident command established
- Federal support requested
- Public health emergency declared
- Syringe exchange started
- Local HIV clinic opened
- HIV testing staff and DIS deployed

>35,000 cumulative syringes dispensed

>77,000 cumulative syringes dispensed
CDC: 220 Counties Most Vulnerable to OUD-related Outbreak of HIV

Top 220 Counties

206 (94%) have no SSP

Van Handel et al. JAIDS 2016; opioid.AMFAR.org
CDC: 220 Counties Most Vulnerable to OUD-related Outbreak of HIV

Top 220 Counties

Van Handel et al. JAIDS 2016; opioid.AMFAR.org
NIDA/CDC/SAMHSA/ARC Funded
8 Rural Opioid Initiative (UG3) Sites and GHOST Lab

NIDA RFA: “HIV, HCV and Related Comorbidities in Rural Communities Affected by Opioid Injection Drug Epidemics in the United States: Building Systems for Prevention, Treatment & Control”
HIV is surging in Lawrence and Lowell. The CDC wants to know why

 Syndemic Concerns not theoretical in our region...

• 2105-18: 129 new HIV+ in Lowell and Lawrence
• 2012-14: 41 new cases
  o age 20-39
  o Fentanyl-related IDU
  o 90% HCV+
  o High rates of homelessness

The Commonwealth of Massachusetts
Executive Office of Health and Human Services
Department of Public Health
250 Washington Street, Boston, MA 02108-4619

November 27, 2017

Massachusetts Department of Public Health raises level of concern about increased HIV transmission through injection drug use, in light of the current epidemic of opiate/opioid misuse and recent observations.

The Massachusetts Department of Public Health (MDPH) has noted an increase in newly diagnosed and acute HIV infections among persons who inject drugs (PWID). To date in calendar year 2017 (through November 21), there have been 64 HIV infections reported among individuals who inject drugs in Massachusetts, representing 14% of all HIV infections reported this year. Over the past 5-10 years, newly diagnosed HIV infection in PWID amounted to 32-62 cases annually, representing a stable proportion of 4-8% of all reported HIV infections. Investigation of cases is ongoing.
**DISCERNNE: A 2-Phase Study**

1. **UG3 (2 yrs):**
   In 11 rural counties along the I-91/CT River corridor in MA, NH, VT:
   - Characterize the epidemiology of overdose and injection-associated infectious disease
   - Assess local policy, resource and risk environment

2. **UH3 (3 yrs):**
   Field an intervention to address gaps
UG3: Mixed Method Study

- Assess public health data, law, policies and services
- Respondent-driven sample (RDS) survey, 5/18-10/19
  - N=589, age 18+, IDU or opioid use in prior 30 days
  - 90-minute quantitative and social network survey
  - Toxicology and laboratory testing (HIV, HCV, syphilis)
- Semi-structured interviews
  - Stakeholders (n = 31)
    - healthcare, harm reduction, addiction tx, public health, law enforcement
  - Persons who use drugs (PWUDs) (n=22)

Stopka et al., Prev Med 2019
The opioid epidemic in rural northern New England: An approach to epidemiologic, policy, and legal surveillance

Thomas J. Stopka, Erin Jacque, Patsy Kelso, Haley Guhn-Knight, Kerry Nolte, Randall Hoskinson Jr, Amanda Jones, Joseph Harding, Aurora Drew, Anne VanDonsel, Peter D. Friedmann

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Syndemic Outcomes, 2014-16

Fatal Overdose Rate

HCV Prevalence

Prevalence of people living with HIV/AIDS

Stopka et al., Prev Med 2019
Socioeconomic Context, 2016

Economic disparities

Low Income

High Income

High Income

High Rates of Uninsured

Percent Uninsured

Unemployment, Age 16 and Over

High Unemployment

Stopka et al., Prev Med 2019

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Stopka et al., Prev Med 2019
# Respondent-Driven Sample

<table>
<thead>
<tr>
<th></th>
<th>DISCERNNE</th>
<th>Scott County*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>n</strong></td>
<td>n=589</td>
<td>n=196</td>
</tr>
<tr>
<td><strong>Male, %</strong></td>
<td>58%</td>
<td>58%</td>
</tr>
<tr>
<td><strong>Median age (IQR)</strong></td>
<td>34 (28-42) years</td>
<td>33 (27–41) years</td>
</tr>
<tr>
<td><strong>Non-Hispanic white, %</strong></td>
<td>88%</td>
<td>99%</td>
</tr>
<tr>
<td><strong>Homeless past 6 mos, %</strong></td>
<td>56%</td>
<td></td>
</tr>
<tr>
<td><strong>Shared inj equip %</strong></td>
<td>53% past 30 days</td>
<td>70% ever</td>
</tr>
<tr>
<td><strong>Incarcerated, %</strong></td>
<td>29% past 6 mos.</td>
<td>54% past year</td>
</tr>
<tr>
<td><strong>Sex for money or drugs</strong></td>
<td>10% past 30 days</td>
<td>9% ever</td>
</tr>
</tbody>
</table>

*Peters et al. NEJM 2016
Drug Use

- > 95% had ever used opioid painkillers, heroin, & cocaine/crack
- 60% reported heroin as drug of choice
51% Ever Overdosed

- Once: 25%
- 2-3x: 42%
- 4-10x: 25%
- >10x: 8%
- Seen OD: 81%
- Know someone: 86%
- Called 911: 50%
- Gotten naloxone: 67%
Most have h/o Addiction Treatment, but Current Utilization is Low

- 79% ever treated – counseling most common
- 32% have not had access to MOUD
MOUD Treatment Less Common than Other Modalities

Addiction Treatment Received in the Past 30 Days

- BUP maint.: 22%
- MTD maint.: 17%
- NTX inj.: 2%
- BUP inj.: 2%
- Counseling: 33%
- Self-help groups: 26%
- Detox: 17%
- Res/Inpt: 16%
- Sober housing: 12%
Frequency of Injection (n=453 who injected in past 30 days)

- Overall 85% h/o injection

Bar chart showing:
- 32 participants injected once in the past 30 days
- 63 participants injected more than once in the past 30 days
- 42 participants injected weekly
- 47 participants injected more than weekly
- 96 participants injected daily
- 75 participants injected 2-3 times a day
- 97 participants injected more than 3 times a day

60% daily or more
Injection Behavior
(n=453 who injected in past 30 days)

- PWIDs shared equipment: 78%
- Injected multiple times in one sitting: 75%
UG3: Mixed Method Study

• Assess public health data, law, policies and services
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• Semi-structured interviews
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    • healthcare, harm reduction, addiction tx, public health, law enforcement
  – Persons who use drugs (PWUDs) (n=22)
“...if somebody wants to get high and they don’t have a needle to use, they’ll pick one up of the ground and use it. That’s how desperate they are...It could’ve been 500 people...and they’ll still pick it up and use it. Because, and, and they won’t, and they won’t say oh well, I’ll just sniff it this time. That’s not going to happen. They’ll hunt it down until they find it.”

-Participant, Keene, NH
Syringe Access
(n=453 who injected in past 30 days)

% of participants reporting easy access to clean syringes

- **MA**: 96%
- **NH**: 47%
- **VT**: 74%

Syringe Source:
- Pharmacy: 25%
- SSP in person: 22%
- Secondary exchange: 18%
- Friend/family: 7%
- Dealer/street: 7%
- Other: 22%
Proximity to Exchange
(n=453 who injected in past 30 days)

- NH (n=154)
- VT/MA (n=299)

<table>
<thead>
<tr>
<th>Distance</th>
<th>NH</th>
<th>VT/MA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Could walk there</td>
<td>59</td>
<td>10</td>
</tr>
<tr>
<td>&lt; 30 min drive</td>
<td>24</td>
<td>15</td>
</tr>
<tr>
<td>30-60 min drive</td>
<td>18</td>
<td>5</td>
</tr>
<tr>
<td>&gt; 1 hr drive</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>None reasonably close</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Don't know</td>
<td>36</td>
<td>9</td>
</tr>
</tbody>
</table>
HIV & Major Bacterial Infections

• 81% previously tested for HIV
  – 84% received results
    • 7 (1%) reported told they were HIV positive
    • 3 have a doctor and take medication
    • No new HIV detected

• 31% heard of med to prevent HIV (PrEP)

• 10% had been hospitalized for major bacterial infection
HCV Prevalence and Treatment
(n=422 PWID with usable results)

- 306 (73%) tested positive for HCV antibodies:
GEE Model: Correlates of HCV Serostatus

- Age (per 10 years)
- Non-White race (vs. White)
- Homeless in past 6 mo.
- Incarcerated in past 6 mo.
- Inject at least 1x/day (vs. < daily)
- Shared injection equip. in past 30 days
- Syringe source: pharmacy or exchange...
- Ever overdosed

Adjusted Odds Ratio

- Age (per 10 years): 1.34 (1.22-1.47)
- Non-White race (vs. White): 3.17 (2.12-4.47)
- Homeless in past 6 mo.: 1.39 (1.12-1.71)
- Incarcerated in past 6 mo.: 1.64 (1.14-2.36)
- Inject at least 1x/day (vs. < daily): 2.27 (1.59-3.24)
- Shared injection equip. in past 30 days: 1.80 (1.42-2.28)
- Syringe source: pharmacy or exchange...
- Ever overdosed: 0.69 (0.51-0.91)
“Nowadays they just say ‘well what, do you got hep C? I got hep C. Well that’s it? Alright. Well I got it too.’ And they’ll joke around like ‘well hep C’s got so many different strands that well you’ll just get another strand. Or I’ll get another strand. Or all three of us. We got three new strands!’ It’s like a joke.”
Windham County, VT vs. Cheshire County, NH

<table>
<thead>
<tr>
<th>Category</th>
<th>Windham (n=132)</th>
<th>Cheshire (n=117)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCV seropositive</td>
<td>62</td>
<td>82</td>
</tr>
<tr>
<td>Shared Inj. Equip. (past 30 days)</td>
<td>52</td>
<td>85</td>
</tr>
<tr>
<td>Somewhat/strongly agree it's easy to get clean syringes</td>
<td>68</td>
<td>44</td>
</tr>
</tbody>
</table>
Primary Source of Health Care
Past 6 months

- 30% Private Doctor
- 30% Health center/urgent care
- 20% Emergency Department
- 20% None
Reasons for Not Getting Needed Care

- Afraid of Disrespect: 50%
- Treated poorly in past: 30%
- Don't trust doctors: 30%
- Don't care about health: 20%
- Could not pay: 10%
- No transportation: 40%
Stigma remains a barrier to effective intervention

From a SSP staff person –
“And there’s still like…there’s a real hard core…opposition to treating people who use drugs for Hepatitis C…. just like what drug users should and shouldn’t have access to or rights to. And that influences policy advocacy and acquisition and money, you know?”

From an emergency room doctor –
“And I’ve learned that you can treat Hep C, but if you keep using needles you’ll catch it again. So that $100,000 treatment might have to be repeated. And I know the state of the Medicaid budget in this state, and I think these people are going to be on their own. I don’t think the state can afford it.”

From a police chief in a town that has an SSP –
“Well, I think, um, uh, we do not have a needle exchange program and I don’t support it and wouldn’t advocate for it.”
“...if you take limited hours and then you take limited transportation, you put the two things together, you have a serious access problem... And sometimes you might have to hang out for hours just finding something to do before you can make it back to your home. Maybe you are going to miss work...”
I was 12 years old… My father gave me a line of oxycodone… he just broke it out and said here, sniff this. And I said, uh how? And he showed me how he did it, and I did it. (Jacob, 24M)

My god it’s horrible. I literally can remember… thinking that [this town] was a great area to grow up in and raise a family. And maybe I was just really extra oblivious then but, uh, it’s, drugs were like scarce. [Using drugs] was the exception. Now people that don’t do drugs are the exception. There’s more drugs or people using… everywhere. (Amanda, 29F)

So they took me in and did surgery and they put me on, um oxycontins 60 milligrams four times a day… And that’s why I got addicted. I was on it for two or three years, and then finally they shut me off… They supposedly got a call saying that we were abusing meds or selling them or whatever… I know like four or five people that… all got shut off the same day… I tried to find the pill if I had the money. But yeah, you couldn’t. Yes, so I went to the heroin. (Michelle, mid-50s F)

And then the doctor took them away from me and I was in pain. I was sick, throwing up… physically was sick from it, from not having it. And where did I go? I went to the streets to find them. And then that became too expensive. And then I went to heroin. (Jessica, 32F)

Last year I lost my baby… it was a stillborn… before that I lost my best friend’s dad who was like a father to me growing up… just three weeks ago my mothers’ boyfriend shot himself in the head in front of my mom. But it’s just a lot of trauma happening lately… it’s just a lot of things piling up. Life’s pretty unforgiving sometimes. (Matt, 24M)

Themes Related to Opioid Use & Transition to Injection

Normalization of Drug Use within the Family and Community

Trauma

Escalation of use

Pain & Abrupt D/C of Prescription Opioids

Transition to heroin

Lower Cost
Increased Effect/Rush
Greater Availability
Faster Relief

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Summary: Rural NNE Risk Environment

- Area-level deprivation/social capital
  - Unemployment, trauma, stigma, distrust, provider unwillingness to treat active users for HCV
- Policy and cultural status of drug use
  - Policy climate limits action, normalization of drug use and syringe sharing
- Access to needed services
  - Transportation gaps, geospatial access to MOUD, naloxone, syringes, HCV treatment
- CJ activity
- “Big events”
Significant Population at Risk in Rural NNE

• CDC analysis underestimated risk in NNE
  – High rates syringe sharing and HCV
  – SSP access limited

• After conferring with local partners
  – States have MOUD initiatives in motion
  – UH3 focus on HCV treatment and harm reduction
Mobile Tele-HCV Treatment Integrated w/ Syringe Services

1. Examine effectiveness of mobile telemedicine treatment for HCV integrated with syringe services

2. Validate the accuracy of dried blood spot (DBS) testing for HCV viral load as a surveillance strategy to address limited rural phlebotomy services.
UH3: Study Hypotheses

Mobile tele-HCV care will be associated with:

• HCV treatment initiation
• HCV SVR 12-weeks post treatment
• Reduced syringe sharing

Secondary outcomes

• HAV and HBV vaccination completion rates
• MOUD initiation
• Health-related quality of life (HRQOL)
• Substance use
Can HCV Tx ↓ Sharing of Injection Equipment?

• 5 studies of impact of HCV tx on injecting behavior
  – ↓ past month injection drug use 3 of 4 studies
  – ↓ weekly injection frequency 1 of 2 studies
  – ↓ sharing 2 of 3 studies
  – All but one from interferon era

• Two Phase 4 DAA studies (n=190)
  – At baseline, 62% reported injecting past month
    • 47% opioids, 39% stimulants
    • 61% receiving MOUD
    • 16% reported sharing injection equipment.
  – Over 2 year f/u,
    • ↓ opioid injection (OR = 0.95; 95% CI, 0.92-0.99)
    • ↓ sharing of injection equipment (OR = 0.87; 95% CI, 0.80-0.94)
    • Limited impact on stimulant injection

Caven et al. Int J Drug Pol 2019; Artenie et al. 2019
UH3 Overview

Prescreening
- Re-contact HCV+ UG3 participants
- Referrals from community partners

Eligibility Screening (T0)
- Informed consent
- Rapid HCV test
- Fibroscan
- Blood draw and DBS
- Locator form
- Health insurance enrollment

Randomization (T0-R)
- MTC: Mobile Tele-HCV Care
- EUC: Referral for HCV Care + Care Navigator

Visit T1
- MTC only:
  - Telemedicine visits
  - DAA
- EUC only:
  - Care navigation

Follow-up visits (EOT, 12, 24, 36 weeks after)
- MTC only:
  - Telemedicine visits PRN
  - HAV & HBV vaccination

Both groups:
- Initial HAV & HBV vaccination
- Harm reduction services
- ACASI
- HCV viral load

(N=220)
UH3 Intervention Plan: Outcomes

• End-of-treatment (8 or 12 wks)
• Post-treatment follow up (12, 24 & 36 wk later)
  – ACASI: HCV Tx initiation, adherence; syringe sharing; quality of life; substance use
  – Blood: DBS, virologic response (e.g. SVR12), viral genetics
  – Ethnography, on-the-spot interviews to assess implementation
Summary

• Several rural northern NE counties are at high risk for Scott County-like outbreaks — syringe sharing and HCV are highly prevalent:
  • Mobile van in UH3 to address service gaps
    – Access to harm reduction, phlebotomy services
    – HCV testing and treatment limited, esp. in NH & VT
• Comprehensive, long-term community-level and policy interventions needed to address risk and resource environment.
Study Team

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- Local harm reduction, opioid use disorder treatment and medical care partners
- Dartmouth Institute
- Massachusetts Dept of Public Health
- NH Dept of Health and Human Services
- VT Dept of Health
- Tufts School of Medicine
- UMMS-Baystate
- University of New Hampshire
- UVM School of Medicine
Logic Model of Fatal Opioid Overdoses in New Hampshire

State Policy Environmental Factors related to Fatal Opioid Overdoses:
1) State Opioid Use Disorder (OUD)
   Funding: Minimal state tax base (no income or sales tax)/ Alcohol Fund from liquor revenues utilized for treatment and recovery services historically underfunded
2) Few Syringe Service Programs (SSP) or outreach to people who use drugs at risk for overdose (OD), SSP legislation passed 2017
3) State supported OUD treatment programs primarily abstinence based approaches- stigma toward Medication Assisted Therapy (MAT) with 3 of 12 state contracted providers offering MAT and varied support from Recovery Community Organizations (RCOs)
4) Limited care options for dual diagnosis/complex medical needs

PDMP Policy: Requires registration of prescribers, reports patient alerts to providers, prescribers required to document history, assess risk, and query PDMP for opioid prescriptions only (Inhibiting Factor)

Opoid Use/ Dependence
Opoid Use Disorder
Co-morbid Conditions: medical (ex HIV, Hepatitis C), psychiatric (ex bipolar), substance use (ex amphetamine use)
Reduced opioid tolerance (cessation of treatment, release from incarceration or hospital)

SUD Treatment Access Policies: Alternative sentencing available in 5 of 10 counties (Cheshire, Grafton, Rockingham, Strafford, Belknap, Southern Hillsborough) (Enabling Factor)

SUD Treatment Access Policies: Increased access through state contracts and Medicaid expansion (Inhibiting Factor); inadequate access to suboxone, naltrexone and methadone maintenance (Enabling Factor)

Access to available street-level opioids (Rx diversion; heroin and fentanyl)
Highly potent and variable opioids on street market (ex. fentanyl analogues)
Reduced tolerance and comorbid conditions increase risk for OD (ex concurrent benzodiazepine use)

Naloxone Access Policies: Statewide naloxone standing order eases access without prescription; DHHS distribution through RCOs, community orgs, and some health centers (Inhibiting Factor)

Good Samaritan Policies: Protects those calling 911 for drug OD (Inhibiting Factor), although charges pursued for providing drugs in event of a fatal OD (Enabling Factor)

Stopka et al., Prev Med 2019
Among the 187 PWID who reported previously having tested positive for HCV:

<table>
<thead>
<tr>
<th>Risk Behavior (past 30 days)</th>
<th>Receiving/Finished HCV treatment (n=26), No. (%)</th>
<th>No Hx of HCV treatment (n=161), No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syringe sharing</td>
<td>12 (46)</td>
<td>88 (55)</td>
</tr>
<tr>
<td>Sharing other injection equipment</td>
<td>13 (50)</td>
<td>91 (57)</td>
</tr>
<tr>
<td>Backloading</td>
<td>12 (46)</td>
<td>81 (50)</td>
</tr>
</tbody>
</table>

*risk behaviors and history of HCV treatment were both self-reported*