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NDEWS HOTSPOT REPORT

UNDERSTANDING OPIOID OVERDOSES IN NEW HAMPSHIRE

Phase II of a National Drug Early Warning System (NDEWS) HotSpot Rapid Epidemiological Study

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UNDERSTANDING OPIOID OVERDOSES IN NEW HAMPSHIRE

OVERVIEW

Rates of synthetic non-methadone opioid overdose in New Hampshire have increased by nearly 1,600% from 2010 to 2015. From 2014-2015, the latest data available for this report, the state saw an increase of 94.4%, rising from 12.4 to 24.1 opioid overdoses per 100,000 residents in that year alone. The escalation is predominately driven by increased rates of fentanyl use and overdose.

In August 2016, the National Drug Early Warning System (NDEWS) and the Center for Technology and Behavioral Health (CTBH) at Dartmouth College, with funding from the National Institute on Drug Abuse (NIDA), partnered to conduct a Rapid HotSpot study on New Hampshire's synthetic non-methadone opioid (fentanyl) overdose crisis in two phases. During Phase I, researchers met with a diverse array of New Hampshire stakeholders to produce a report about the fentanyl outbreak, highlighting available data and information learned. Results of the Phase I study indicated that real-time data from opioid consumers and first responders was imperative to more accurately inform policy (Phase II). This report presents results from Phase II.

METHODS

Phase II of the NDEWS Rapid HotSpot study was conducted as an epidemiological investigation into the experiences and perspectives of opioid users, first responders and emergency department (R/ED) personnel surrounding the opioid overdose crisis in New Hampshire. Seventy-six opioid consumers, 18 first responders, and 18 emergency department personnel were recruited from six counties across New Hampshire. Recruitment was heavily targeted in Hillsborough County, which has seen particularly high rates of opioid overdoses. Each participant completed a semi-structured interview and a brief demographic survey. Interviews focused on questions that arose during the Phase I HotSpot study, including trajectory of opioid use, experiences with overdose, trafficking and formulation of fentanyl, fentanyl-seeking versus accidental ingestion, the value of harm reduction models, prevention strategies and treatment preferences.

Interviews were transcribed and analyzed using content analysis to condense the transcripts into content-related categories and review these for themes.

PARTICIPANTS

For this NDEWS HotSpot report, we conducted initial analyses of 20 consumers and 12 R/ED personnel (3 Emergency Department, 3 Emergency Medical Services, 3 Fire, 3 Police).

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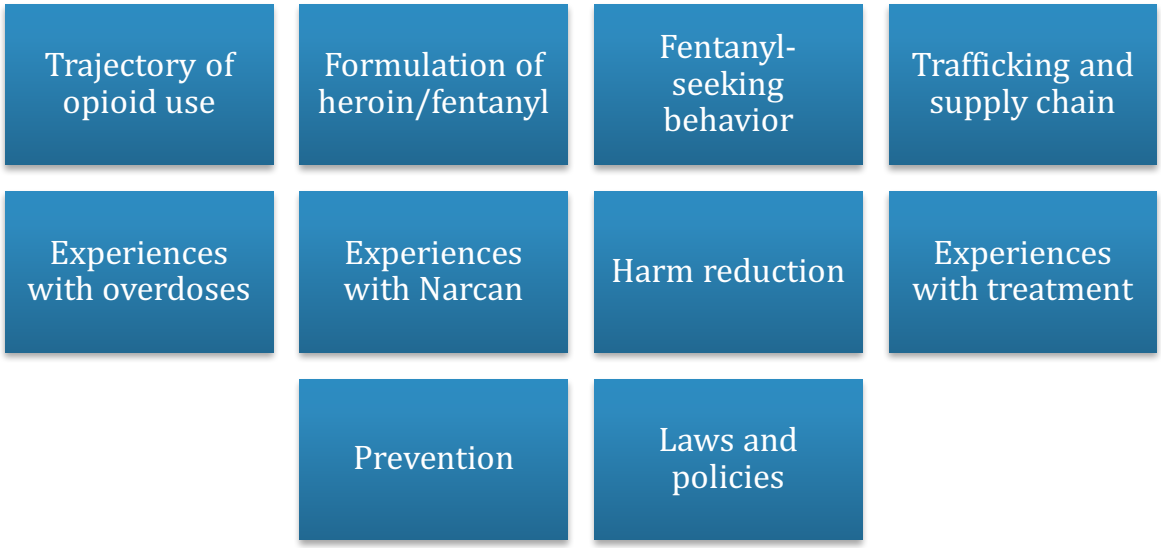
Consumers were, on average, 34.1 (sd 7.5) years of age, 55% (11) were male, 90.% (18) were white, and all (20) were neither Hispanic nor Latino.

Responders were, on average, 47.8 (sd 7.2) years of age, 83.3% (10) were male, 91.7% (11) were white, and all who reported ethnicity (11) were neither Hispanic nor Latino.

THEMES IDENTIFIED

Analysis of consumer and R/ED personnel interviews resulted in 10 identified categories:



RESULTS

Trajectory of opioid use

The initial results suggest that consumers' path to opioid use was typically associated with:

- Early recreational substance use,
- Severe injuries warranting a prescription opioid, sometimes followed by an abrupt taper,
- Intergenerational substance use among nuclear family members, and/or
- Self-medication of mental health conditions.

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Formulation of Heroin and Fentanyl

Consumers report being able to distinguish between fentanyl and heroin by the substance's color, taste, subjective effect, and cost. Responders report limited knowledge of the formulation of heroin/fentanyl.

Fentanyl-seeking behavior

Most consumers report seeking drugs that are known to have caused an overdose, but typically do not specifically seek fentanyl alone. The majority of consumers report being neutral or averse to using fentanyl but if they hear that it is present in a batch that caused an overdose, they report seeking that batch. R/ED personnel have mixed reports of this behavior among consumers.

Trafficking and supply chain

Consumers and R/ED personnel both report fentanyl hit the supply chain in New Hampshire in 2014-2015. Consumers and R/ED personnel report fentanyl is locally manufactured in, and distributed from, Massachusetts, as there is a potential profit from selling in New Hampshire versus Massachusetts. Demand in the state is driven by lower cost, higher potency, and easier availability. Many believe fentanyl originates in China or Mexico.

Experiences with overdoses

Almost two-thirds of consumers had experienced an overdose. Both consumers and R/ED personnel agreed that fentanyl is the primary cause of overdose in New Hampshire, largely due to its potency and inconsistency in fentanyl/heroin mixes. Both groups unanimously reported that overdoses in the state occur across all demographics.

Experiences with Narcan

Neither consumers nor R/ED personnel had observed any side effects from naloxone (Narcan) administrations, aside from its intended effect of precipitated withdrawal during overdose reversal. Despite this, consumers reported many barriers to obtaining Narcan including high cost, fear of police, fear of stigmatization, lack of knowledge, and fear of withdrawal after administration. No unanticipated side effects were observed.

Harm reduction

R/ED personnel and consumers both endorsed the need for needle exchange programs in New Hampshire, in addition to increasing the availability of medication-assisted treatment, medically assisted detoxification, and other treatment services.

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Experiences with treatment

Both consumers and R/ED personnel agreed that consumers cannot stop using opioids without help. Available services are lacking in New Hampshire and include lengthy waitlists, trouble navigating the system, and funding (both for consumers to afford care and for programs to provide it). Referral rates after overdose treatment are low due to staffing shortages. Recommendations for improvement include:

- Increasing access to medication assisted treatment, especially Suboxone,
- Medically-assisted detoxification, and
- More counseling options.

Prevention

Participants reported that additional prevention efforts are necessary and suggested early education about opioids (before middle school), dismantling the stigma around substance use, prudent prescribing of opioid analgesics, and more education for patients regarding pain and opioids. R/ED personnel expressed the need to mobilize communities to fight this epidemic.

Laws and policies

Consumers are not well informed about state laws and policies regarding opioid use. There is frustration and mistrust towards police and the justice system due to encounters with the criminal justice system, lack of treatment availability in jail and mistrust of the Good Samaritan Law (allowing consumers to report an overdose and be immune from prosecution at that event). Consumers and R/ED personnel reported that new prescribing crackdowns may reduce opioid prescribing but would likely mean an increase in heroin use. Prescription Drug Monitoring Programs were viewed as useful but burdensome by ED staff.

UNIQUENESS OF NEW HAMPSHIRE

New Hampshire has significantly higher rates of prescribing of long-acting/extended release opioids as well as concurrent prescribing of high-dose opioids and benzodiazepines than the national average. The shortage of treatment funding and availability, lower rates of Suboxone prescribers per capita, an absence of a needle exchange program, barriers to accessing Narcan, and the proximity of interstate access to the supply chain were identified as making New Hampshire's opioid problem unique from other states. Some consumers and R/ED personnel also identified the rural setting of New Hampshire as a contributing factor, i.e., "Live Free or Die."

EXECUTIVE SUMMARY

NEXT STEPS

Based on data from this study, preliminary considerations for New Hampshire's approach to tackling the opioid overdose crisis include:

- Increase public health funds targeting substance use;
- Expand prevention programs in elementary and middle schools;
- Strengthen treatment to include broader availability, non-prohibitive cost, and inclusion of medication-assisted options and holistic approaches;
- Incentivize physicians to become buprenorphine-waivered providers;
- Assist physicians with prudent prescribing of opioids, educating patients, and alternatives to pain management;
- Support first responder and emergency department personnel with vicarious trauma associated with responding to overdoses;
- Initiate needle exchange programs;
- Collaborate with Massachusetts on addressing the manufacturing and trafficking of fentanyl and other opioids; and
- Launch programming to dispel stigma and fear:
    - Educate consumers (e.g., Narcan and Good Samaritan Law)
    - Educate physicians and pharmacists (e.g., chronic disease management and value of Narcan)
    - Educate law enforcement (e.g., alternative approaches to punitive measures)
    - Educate the public (e.g., opioid crisis is not isolated to one demographic/area and breaking the intergenerational cycle of addiction)

INTRODUCTION

PHASE 1 HOTSPOT STUDY

Since 2014, the state of New Hampshire saw a disproportionately high rate of opioid overdoses compared to other states, especially involving the use of fentanyl. From 2013 to 2014 alone, the Centers for Disease Control and Prevention (CDC) reported a 73.5% increase in opioid overdoses in the state; estimations of that number have only increased in the years since. In the 2013-2014 reporting period, New Hampshire residents died of synthetic opioid-related overdoses at a rate of 12.4 per 100,000. The second-closest state to that rate during that reporting period, Rhode Island, saw synthetic opioid-related overdose deaths at a rate of 7.9 per 100,000. In December 2016, the CDC released updated data for the 2014-2015 reporting period. Alarmingly, New Hampshire saw a doubling (an increase of 94.4%) of synthetic opioid-related overdose deaths per capita from 2014-2015; 24.1 per 100,000 in New Hampshire died from synthetic opioid-related overdoses in 2014-2015. The second-closest state reporting deaths in that period was Massachusetts, which saw 14.4 per 100,000 (Centers for Disease Control and Prevention (CDC), 2016).

In 2014, the National Institute on Drug Abuse (NIDA) initiated a Cooperative Agreement with the Center for Substance Abuse Research (CESAR) at the University of Maryland to create the Coordinating Center for the National Drug Early Warning System (NDEWS). NDEWS offers the unique ability to rapidly identify emerging drugs, including synthetic opioids such as fentanyl, and facilitate a more rapid and informed response to outbreaks and changes in substance use and misuse. One innovative component of NDEWS is the ability to launch rapid HotSpot studies of local drug outbreaks. In partnership with the NDEWS and funding by NIDA, the Center for Technology and Behavioral Health (CTBH) at Dartmouth College conducted a Phase I Rapid HotSpot study (National Drug Early Warning System (NDEWS), 2016), on New Hampshire's non-methadone synthetic opioid (fentanyl) overdose crisis in August 2016 in two phases. During the Phase I rapid study, the CTBH and NDEWS teams met with multiple stakeholders throughout the state, including treatment providers, medical responders, law enforcement, and state authorities and policymakers, to learn more about their perspectives on the fentanyl crisis in New

INTRODUCTION

Hampshire. State authorities expressed serious concern regarding the state's apparent trend towards higher rates of alcohol and drug use compared to the rest of the country in national surveys, and were concerned that the current drug of choice is fentanyl. Furthermore, questions were raised about how much anecdotal or speculative information is driving policy; it was clear from stakeholders that policy decisions need to be based on valid data about the opioid overdose crisis.

It was apparent from the Phase I interviews with stakeholders in New Hampshire that much is unknown about the fentanyl overdose crisis in the state. Many stakeholders expressed that user-level data was imperative to answer pointed questions to more accurately inform policy, such as the trajectory of fentanyl use, the trafficking of fentanyl, fentanyl-seeking behavior versus accidental ingestion, the value of harm reduction models, and treatment preferences.

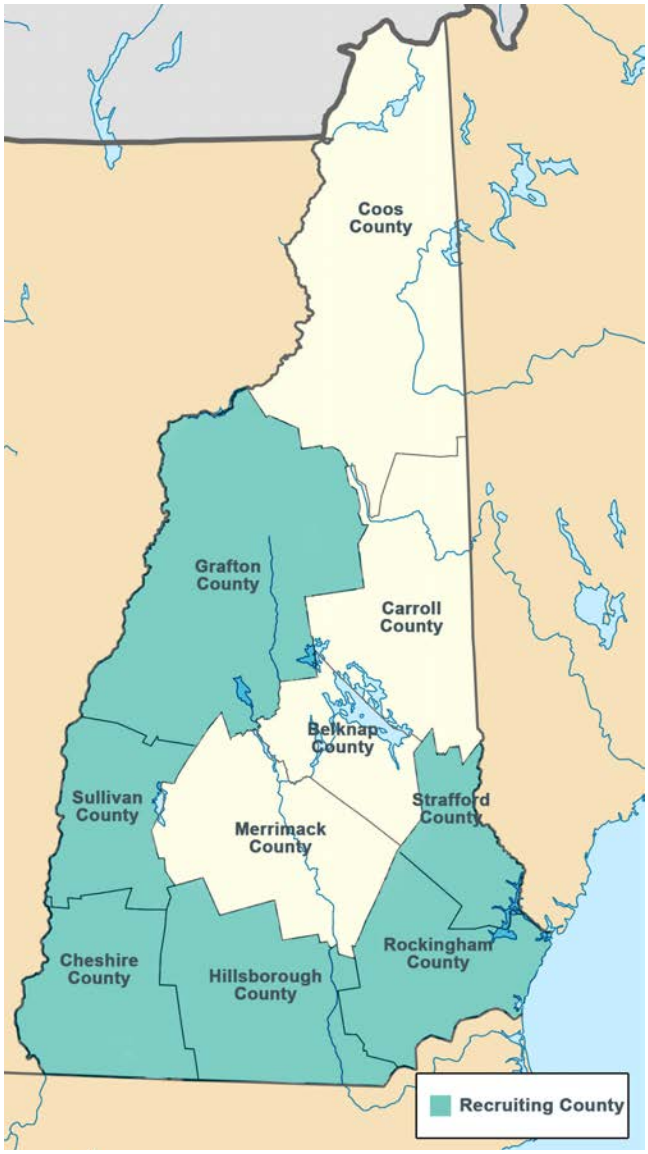

Figure 1. Study Recruitment Area

With the support of NIDA to conduct Phase II, NDEWS awarded sub-contracts to researchers at Dartmouth's CTBH and the University of Maine to conduct two additional studies. The first study involved systematic interviews of first responders, emergency department personnel, active fentanyl users, and individuals new to treatment (the focus of this report from Dartmouth's CTBH). The second study examined medical records and medical examiner investigations for persons who died from fentanyl-related overdoses in New Hampshire (Marcella Sorg, PhD, University of Maine, PI; not included in this report).

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PHASE II RAPID EPIDEMIOLOGICAL STUDY

In the second phase of the NDEWS Rapid HotSpot Study, the research team at CTBH conducted a rapid epidemiological investigation of opioid users', first responders', and emergency department (ED) personnel's perspectives on opioid overdose in New Hampshire, to provide updated data to inform policy on tackling the fentanyl overdose crisis. In addition to the funds provided by NDEWS, CTBH also receives funding from the National Drug Abuse Treatment Clinical Trials Network Northeast Node (based out of CTBH and funded by NIDA: UG1DA040309) and was able to utilize additional funds to cover infrastructure for this project.

The study team conducted 60-minute semi-structured systematic interviews with 76 active opioid consumers or those new to treatment for opioid use disorders, 18 first responders (police, fire, EMS), and 18 emergency department personnel. Interviews were completed either via phone or in-person depending on participant preference. Participant interviewees completed brief demographic and substance use history surveys. Participants were recruited using connections provided by the Northeast Node of the National Drug Abuse Treatment Clinical Trials Network, at Groups, Inc., treatment centers throughout the state, word-of-mouth, posters hung in Safe Station locations, treatment facilities, food banks, shelters, laboratories, and via ads in local newspapers and www.CraigsList.com. Participants were incentivized to participate in this study with $50 gift cards for completing the interview and survey. Sampling was purposely heavily concentrated in Hillsborough County, given that it was targeted as the "hot spot" in New Hampshire (New Hampshire Information and Analysis Center, 2017), with additional sampling in Cheshire, Grafton, Rockingham, Strafford, and Sullivan counties.

Interviews with consumers focused on questions that arose during Phase I, including the trajectory of opioid use, the supply chain, fentanyl-seeking behavior versus accidental ingestion, the value of harm reduction models, opinions about prevention strategies, and treatment preferences.

Systematic interviews were also conducted with first responders (police, fire, and emergency medical service [EMS] personnel) and emergency department (ED) personnel in counties where opioid consumer interviews were conducted. Interviews with these stakeholders concentrated on trends in opioid-related overdoses, including user characteristics and patterns, assessment and investigative protocols, Narcan administration, and referral practices. These participants also completed brief demographic and employment surveys.

A total of 76 consumers and 36 first responders and ED personnel were interviewed. Twenty opioid consumers and 12 first responders and ED staff interviews were analyzed for this NDEWS HotSpot report.

INTRODUCTION

Five research team members conducted the interviews and the majority of the interviews were transcribed by an independent contracting group; a few were transcribed by research team members to facilitate initial familiarity with the data. Given the demands of the condensed timeline for Institutional Review Board (IRB) review, recruitment, interview conduct, analyses and report production (6 months), as well as the reasonable expectation of reaching 'saturation'—the point at which interview answers maintain consistency, usually after reviewing 12-15 interviews per group (Guest, Bunce, & Johnson, 2006)—we analyzed 20 consumer (weighted across the targeted NH counties) and 12 responder (3 ED, 3 EMS, 3 Fire, 3 Police) interviews. All additional interviews are currently being analyzed, and these data will be included in future planned publications.

The primary research team analysts used content analysis to systematically analyze and describe these different perspectives on opioid overdose by condensing voluminous pages of the transcripts into content-related categories that were then reviewed for patterns (themes). Due to the highly structured nature of the interviews, first level codes were largely predetermined by the guides themselves (e.g., trajectories of opioid use, experiences with overdose). The primary analysts independently reviewed a subsample of both consumer and responder transcripts to identify patterns and develop initial code lists. Once the initial code lists were generated, the primary analysts coded the remaining transcripts in the subsample. The larger research team met weekly once data collection was complete so that the primary analysts could share emergent themes from the analyses and so that remaining team members who conducted interviews could provide feedback on the trustworthiness of the data and the analyses. Through these regular check-ins/consensus sessions, code lists were honed and discrepancies were resolved. Demographic data were analyzed using Stata (StataCorp, 2015) to generate descriptive statistics. Once both the qualitative and quantitative data were analyzed, we examined the evidence from the different data sources to triangulate the data, check the accuracy of the findings, and build a coherent understanding of opioid overdose in New Hampshire based on the data.

In line with the aims of this project, ten categories were identified by the research team that best represent the data collected: (1) Trajectory of opioid use, (2) Formulation of heroin and fentanyl, (3) Fentanyl-seeking behavior, (4) Trafficking and supply chain, (5) Experiences with overdoses, (6) Experiences with Narcan, (7) Harm reduction, (8) Treatment, (9) Prevention, and (10) Laws and policies. This report is organized by those categories.

RESEARCH TEAM

The Phase II rapid epidemiological HotSpot study was conducted for NDEWS by the Center for Technology and Behavioral Health (CTBH; www.c4tbh.org) with the support of the Northeast Node of the National Drug Abuse Treatment Clinical Trials Network (CTN;

www.ctnnortheastnode.org), both based at Dartmouth College. The Northeast Node maintains an extensive network of partners throughout New Hampshire, which allowed the study to rapidly coordinate recruitment sites. Additionally, the Northeast Node Administrative Team (Andrea Meier, Director of Operations; Bethany McLeman, Research Project Manager; and Samantha Auty, Research Assistant) provided infrastructure for the research team. Participating CTBH affiliates include Sarah K. Moore, PhD (qualitative research expert), Elizabeth Saunders, MS (PhD student mentee of Dr. Lisa Marsch), and Stephen A. Metcalf, MPhil (CTBH Research Project Manager). Under the leadership of Lisa Marsch, PhD (Director of CTBH and Principal Investigator of the Northeast Node), the research team secured Dartmouth Committee for the Protection of Human Subjects (CPHS) approval, coordinated protocols and recruitment procedures, conducted 112 interviews, participated in the transcription process, analyzed the data collected by this study, and contributed to this NDEWS HotSpot report from October 2016 through March 2017.

ACKNOWLEDGEMENTS

Support for this study was provided by the National Institute on Drug Abuse (NIDA) National Drug Early Warning System (NDEWS) at the University of Maryland (U01DA038360-Z0717001, PI: Eric D. Wish, PhD; Co-I: Erin Artigiani, MA; Sub-award PI: Lisa Marsch, PhD). Infrastructure and support for research team members from the Northeast Node of the National Drug Abuse Treatment Clinical Trials Network was provided by the Clinical Trials Network (UG1DA040309, PI: Lisa Marsch, PhD).

The study was conducted in accordance with all human subject protections and good clinical practices (e.g., Helsinki Declaration, Belmont Principles, and Nuremberg Code). The Trustees of Dartmouth College institutional review board (Committee for the Protection of Human Subjects (CPHS)) approved the collection, analyses, and reporting of these data.

NDEWS is funded under NIDA Cooperative Agreement DA038360, awarded to the Center for Substance Abuse Research (CESAR) at the University of Maryland, College Park. Opinions expressed by the authors of this report may not represent those of NIDA.

STUDY PARTICIPANTS: FULL SAMPLE

OPIOID CONSUMERS

Interviews were conducted with participants who were either actively using opioids or were new to treatment for opioid use disorder. In all, 76 interviews were conducted with opioid consumers from six counties in New Hampshire.

FIRST RESPONDERS

Interviews were conducted with one active police officer, firefighter, and emergency medical services (EMS) member in each of the six counties, for a total of 18 interviews.

EMERGENCY DEPARTMENT STAFF

Interviews were conducted with three clinical staff at

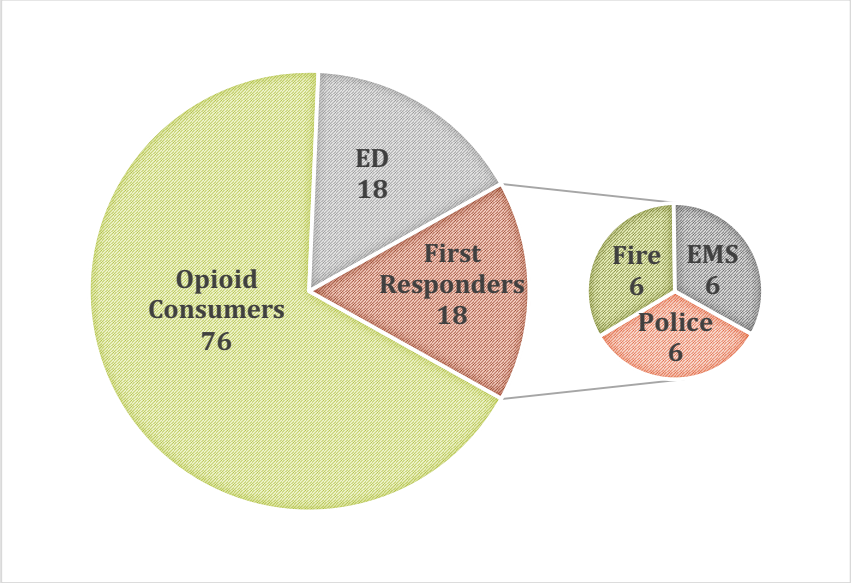

Figure 2. Study Participants - Full Sample

STUDY PARTICIPANTS: FULL SAMPLE

emergency departments (ED) from each of the six counties. Interviewees included nurses, physicians, and ED medical directors. In all, 18 interviews were conducted with emergency department staff across the six counties.

PARTICIPANT RECRUITMENT BY COUNTY

Participant recruitment was conducted in six counties across New Hampshire (see Figure 3). Hillsborough County, in the southern region of the state, was heavily targeted given it has been the focus of the epidemic in the state. Cheshire, Grafton, Rockingham, Strafford and Sullivan counties were also sampled to provide representation across the state and to assess regional variations.

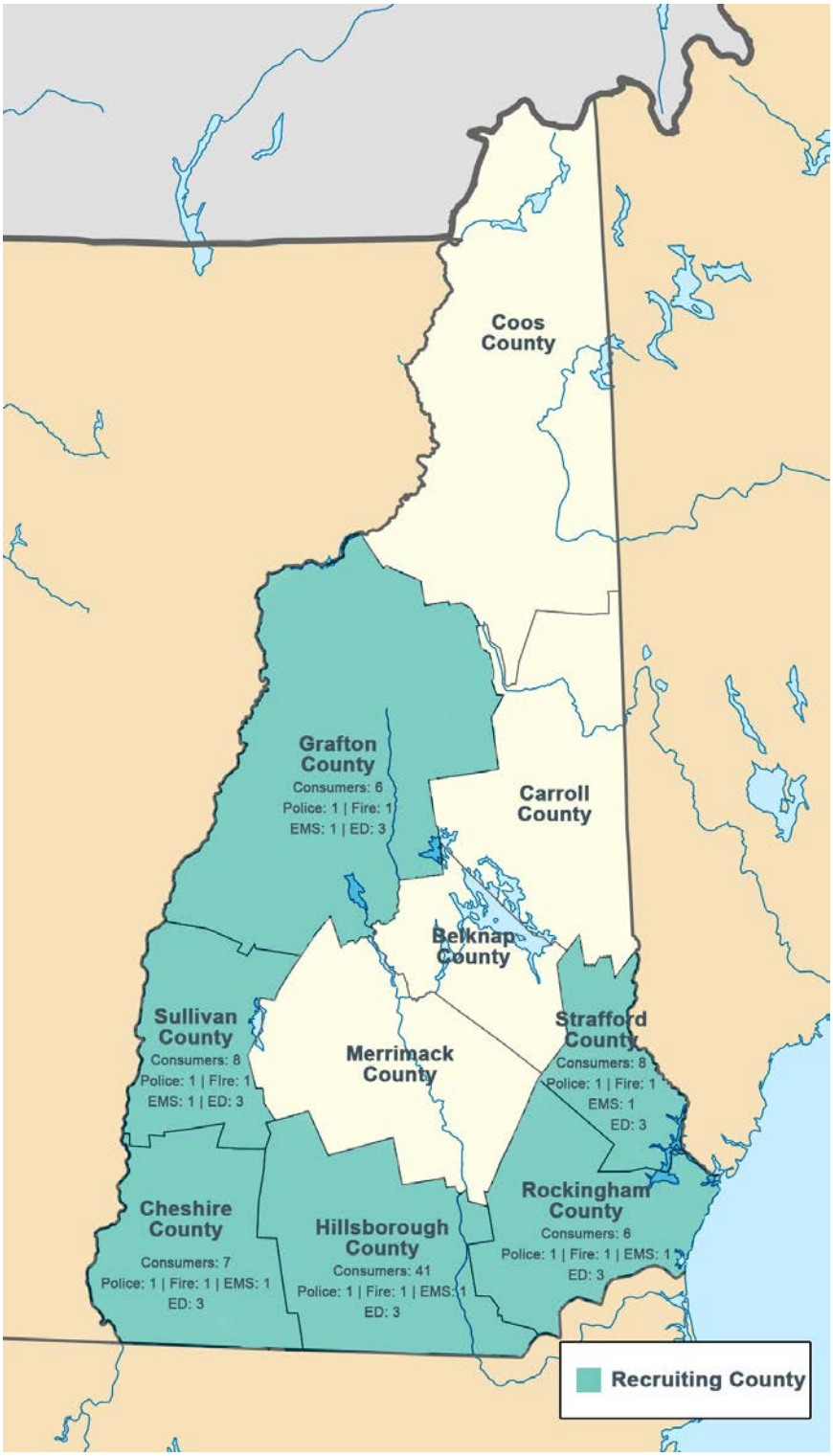

Figure 3. Study Participants - Full Sample

STUDY PARTICIPANTS: SUBSAMPLE

OPIOID CONSUMERS

In this NDEWS HotSpot report, data were analyzed from 20 opioid consumer interviews. To maintain consistency with the study's recruitment plan throughout the six counties, interviews were selected based on location. For this report, 10 interviews were selected from Hillsborough County and two from each of the remaining five counties (Cheshire, Grafton, Rockingham, Strafford, and Sullivan).

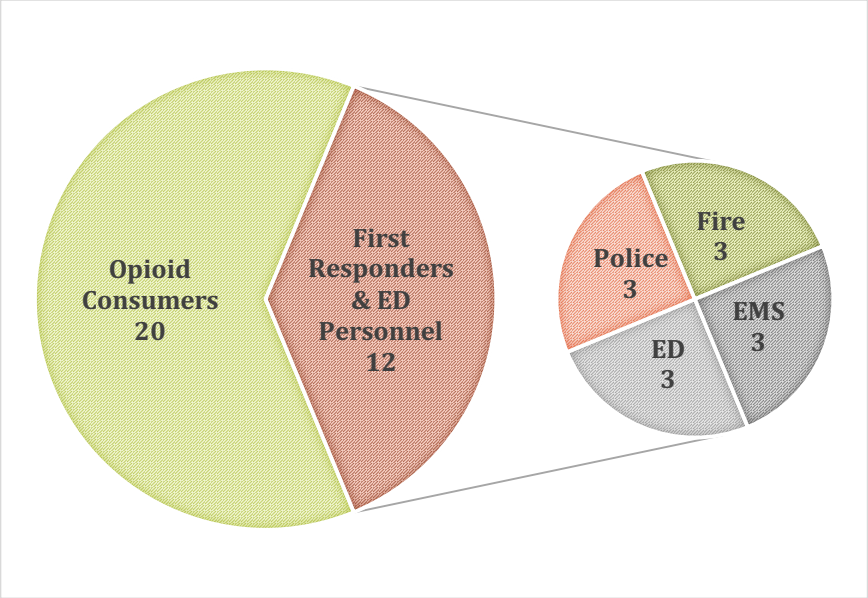

Figure 4. Study Participants - Subsample

Consumer interviews included in the subsample were selected purposively to match the geographic distribution of the full

consumer sample. There were no significant differences in the demographic, lifetime substance use, previous treatment history, or opioid use characteristics between consumers included in the subsample and those included only in the full sample.

FIRST RESPONDERS AND EMERGENCY DEPARTMENT STAFF

In this NDEWS HotSpot report, data were analyzed from 12 first responders/ED staff. To gain an even representation from each division interviewed, three interviews each were selected from police, fire, EMS, and ED participants.

The first responder and emergency department subsample did not differ from the full responder sample by gender, race, ethnicity, or any opioid overdose treatment characteristics. Responders selected for the subsample were significantly older and employed for more years than those only included in the full sample.

SURVEY RESULTS: OPIOID CONSUMERS

TABLE 1. DEMOGRAPHIC CHARACTERISTICS OF NEW HAMPSHIRE OPIOID USERS

Demographics	**Full Sample** (n=76)	**Subsample** (n=20)	**Male** (n=37)	**Female** (n=39)
Age *m(sd)*	34.1 (8.3)	34.1 (7.5)	34.6 (7.4)	33.7 (9.2)
Gender *n(%)*				
Male	37 (48.7%)	11 (55.0%)	37 (100%)	0 (0%)
Female	39 (51.3%)	9 (45.0%)	0 (0%)	39 (100%)
Race *n(%)*				
Asian	1 (1.3%)	1 (5.0%)	0 (0%)	1 (2.6%)
Black/African American	1 (1.3%)	0 (0%)	0 (0%)	1 (2.6%)
White	69 (90.8%)	18 (90.0%)	33 (89.2%)	36 (97.4%)
Other	1 (1.3%)	1 (5.0%)	1 (2.7%)	0 (0%)
Multiracial	4 (5.3%)	0 (0%)	3 (8.1%)	1 (2.6%)
Ethnicity *n(%)*				
Hispanic or Latino	3 (4.0%)	0 (0%)	2 (5.6%)	1 (2.6%)
Not Hispanic or Latino	72 (96.0%)	20 (100%)	34 (94.4%)	38 (97.4%)

SURVEY RESULTS: OPIOID CONSUMERS

(Table 1, Cont.)

Demographics	Full Sample (n=76)	Subsample (n=20)	Male (n=37)	Female (n=39)
Education *n(%)*				
Less than High School	5 (6.6%)	2 (10.0%)	2 (5.4%)	3 (7.7%)
High School/GED	41 (54.0%)	9 (45.0%)	25 (67.6%)	16 (41.0%)
Some College	16 (21.1%)	6 (25.0%)	4 (10.8%)	12 (30.8%)
Associate's	11 (14.5%)	3 (15.0%)	5 (13.5%)	6 (15.4%)
Bachelor's	1 (1.3%)	0 (0%)	1 (2.7%)	0 (0%)
Master's	2 (2.6%)	1 (5.0%)	0 (0%)	2 (5.1%)
Employment Status *n(%)*				
Working Full Time	20 (26.3%)	5 (25.0%)	14 (37.8%)	6 (15.4%)
Working Part Time	9 (11.8%)	3 (15.0%)	5 (13.5%)	4 (10.3%)
Unemployed	22 (29.0%)	6 (30.0%)	11 (29.7%)	11 (28.2%)
Disabled	13 (17.1%)	2 (10.0%)	2 (5.4%)	11 (28.2%)
Keeping House	3 (4.0%)	0 (0%)	0 (0%)	3 (7.7%)
Student	2 (2.6%)	1 (5.0%)	1 (2.7%)	1 (2.6%)
Other	3 (4.0%)	1 (5.0%)	2 (5.4%)	1 (2.6%)
Temporarily Laid Off	4 (5.3%)	2 (10.0%)	2 (5.4%)	2 (5.1%)
Marital Status *n(%)*				
Married	10 (13.2%)	5 (25.0%)	3 (8.1%)	7 (18.0%)
Divorced	9 (11.8%)	3 (15.0%)	5 (13.5%)	4 (10.3%)
Separated	8 (10.5%)	3 (15.0%)	4 (10.8%)	4 (10.3%)
Never Married	31 (40.8%)	8 (40.0%)	19 (51.4%)	12 (30.8%)
Living with Partner	18 (23.7%)	1 (5.0%)	6 (16.2%)	12 (30.8%)
Housing Status *n(%)*				
Own Home	3 (4.0%)	2 (10.0%)	2 (5.4%)	1 (2.6%)
Rent	39 (51.3%)	10 (45.0%)	16 (43.2%)	23 (59.0%)
Live with Someone	20 (26.3%)	5 (25.0%	10 (27.0%)	10 (25.6%)
Residential	2 (2.6%)	1 (5.0%)	1 (2.7%)	1 (2.6%)
Shelter	6 (7.9%)	1 (5.0%)	5 (13.5%)	1 (2.6%)
Homeless	6 (7.9%)	2 (10.0%)	3 (8.1%)	3 (7.7%)
County *n(%)*				
Cheshire	7 (9.2%)	2 (10.0%)	5 (13.5%)	2 (5.1%)
Grafton	6 (7.9%)	2 (10.0%)	3 (8.1%)	3 (7.7%)
Hillsborough	41 (54.0%)	10 (50.0%)	19 (51.4%)	22 (56.4%)
Rockingham	6 (7.9%)	2 (10.0%)	3 (8.1%)	3 (7.7%)
Strafford	8 (10.5%)	2 (10.0%)	4 (10.8%)	4 (10.3%)
Sullivan	8 (10.5%)	2 (10.0%)	3 (8.1%)	5 (12.8%)

Note: T-test conducted to compare means; Pearson's chi-squared test conducted to compare counts; no significant differences in participant characteristics between the full and subsample, or between males and females, all p's>0.05

SURVEY RESULTS: OPIOID CONSUMERS

SUMMARY

The majority of participants were non-Hispanic, white young adults. This demographic profile is consistent with the demographic characteristics of heroin users across the United States (Cicero, Ellis, Surratt, & Kurtz, 2014; Jones, Logan, Gladden, & Bohm, 2015). This sample was relatively educated, with 21% attending some college and 18% of the sample receiving a college degree. One third of participants reported current unemployment, while 38% had full- or part-time employment. Though half of the sample reported renting a home, other participants were homeless, living in a shelter, or residing with someone else. There were no statistically significant differences in demographic characteristics by gender, or among participants included in the qualitative subsample as compared with others from the full sample.

SURVEY RESULTS: OPIOID CONSUMERS

TABLE 2. LIFETIME SUBSTANCE USE AND AGE OF FIRST USE

	Lifetime Use *n(%)*		**Age at First Use** *m(sd)*	
Substance	Full Sample (n=76)	Subsample (n=20)	Full Sample (n=76)	Subsample (n=20)
Alcohol[a]	74 (98.7%)	19 (100%)	13.7 (3.8)	14.5 (5.6)
Cannabis	75 (98.7%)	19 (95.0%)	13.9 (2.8)	13.9 (3.6)
Inhalants	25 (32.9%)	7 (35.0%)	16.1 (4.6)	16.3 (3.2)
Hallucinogens	52 (68.4%)	13 (65.0%)	16.6 (2.9)	16.2 (3.2)
Cocaine	71 (93.4%)	19 (95.0%)	17.9 (3.5)	18.5 (4.4)
Prescription opioids	75 (98.7%)	20 (100%)	21.1 (7.1)	23.5 (8.7)
Stimulants	51 (67.1%)	13 (65.0%)	21.2 (7.7)	20.5 (8.9)
Sedatives	24 (31.6%)	6 (30.0%)	21.4 (7.3)	25.8 (6.2)
Benzodiazepines	53 (69.7%)	12 (60.0%)	22.1 (7.1)	22.6 (6.7)
Heroin	70 (92.1%)	18 (90.0%)	24.1 (7.0)	24.1 (7.1)
Fentanyl	64 (84.2%)	19 (95.0%)	28.1 (7.3)	28.3 (7.4)
Other	4 (5.3%)	1 (5.0%)	28.5 (14.4)	22.0 (--)[b]

Note: T-test conducted to compare means; Pearson's chi-squared test conducted to compare counts; no significant differences between the full and subsamples, all p's>0.05

[a] Full sample: n=76 Subsample: n=20

[b] No standard deviation because mean is for only one participant

SUMMARY

Almost all study participants reported lifetime use of alcohol and cannabis, which generally preceded initiation of any other substances. While some participants reported trying alcohol or cannabis as early as ten years of age, the average age of first alcohol and/or cannabis use was around 13-14 years in the full sample. Participants' average age of first prescription opioid use (21.1 years) predated their first use of heroin (24.1 years) or fentanyl (28.1 years). Of those participants who used prescription opioids, heroin, and fentanyl, 55 (86.0%) used prescription opioids before heroin or fentanyl. Among participants who used both heroin and fentanyl, 54 (71.1%) of participants initiated heroin before fentanyl and 14 (18.4%) initiated both heroin and fentanyl at the same age. This trend of moving from prescriptions opioids to heroin or fentanyl-laced heroin is representative of national trends in opioid use initiation (Cicero 2014, Botticelli 2015). There were no significant differences in lifetime use or age of first use between participants in the subsample and those not included in the subsample.

SURVEY RESULTS: OPIOID CONSUMERS

AGE OF INITIATION BY OPIOID TYPE

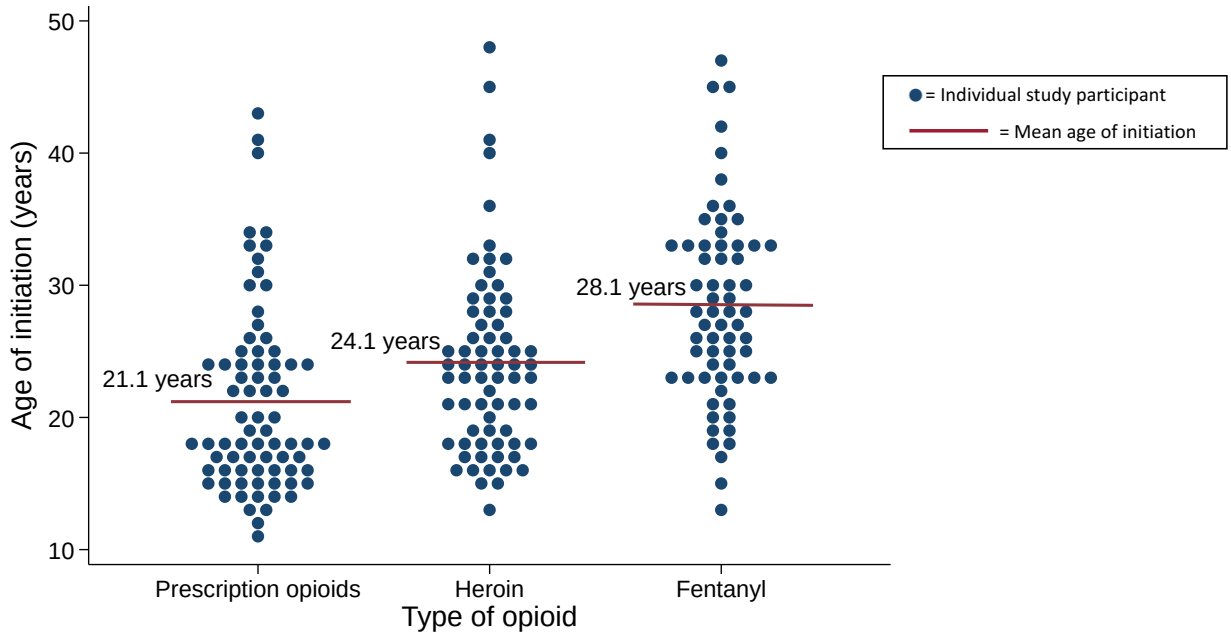

Figure 5. Turnip Plot Representing Age of Initiation by Opioid Type

SUMMARY

Figure 5 shows the mean age (21.1 years for prescription opioids, 24.1 years for heroin, and 28.1 years for illicit fentanyl) at which consumers in the full sample initiated different types of opioid use. As 55 (86.0%) used prescription opioids at a younger age than heroin or fentanyl, and 54 (71.1%) used heroin at a younger age than fentanyl, this figure highlights the pattern of opioid initiation starting with prescription opioids, then moving to heroin and finally fentanyl, on average.

SURVEY RESULTS: OPIOID CONSUMERS

TABLE 3. RECENCY OF OPIOID USE

	Prescription Opioids		Heroin		Fentanyl	
	Full Sample (n=75)	Subsample (n=20)	Full Sample (n=70)	Subsample (n=18)	Full Sample (n=66)	Subsample (n=19)
Last reported use[a]						
Past Week	8 (10.7%)	3 (15.0%)	20 (28.6%)	6 (33.3%)	21 (31.8%)	7 (36.8%)
Past Month	12 (16.0%)	4 (20.0%)	13 (18.6%)	3 (16.7%)	12 (18.2%)	3 (15.8%)
Past 6 Months	16 (21.3%)	4 (20.0%)	18 (25.7%)	5 (27.8%)	14 (21.2%)	3 (15.8%)
More than 6 Months	39 (52.0%)	9 (45.0%)	19 (27.1%)	4 (22.2%)	19 (28.8%)	6 (31.6%)

Note: Pearson's chi-squared test conducted to compare full samples and their respective subsamples; no significant differences between the full and subsamples, all p's>0.05

[a] Among consumers reporting lifetime use

SUMMARY

Over 26.7% of participants in the full sample reported using prescription opioids in the past week or month. Forty-seven percent of consumers reporting lifetime heroin use and 50% of those reporting lifetime fentanyl use had used during the past week or month. There were no significant differences in the recency of opioid use between the subsample and those included in the full sample only.

SURVEY RESULTS: OPIOID CONSUMERS

TABLE 4. PREVIOUS OPIOID USE AND MENTAL HEALTH TREATMENT

Opioid Use Treatment	Full Sample (n=76)	Subsample (n=20)
Lifetime Treatment for Opioid Use *n(%)*		
No	7 (9.2%)	1 (5.0%)
Yes	69 (90.8%)	19 (95.0%)
Number of Treatment Episodes *m(sd)*	6.1 (7.7)	7.7 (10.3)
Currently on OUD Treatment Waitlist *n(%)*	11 (14.7%)	1 (5.0%)
Naltrexone Prescription[a] *n(%)*		
Never	68 (89.5%)	17 (85.0%)
Previously	6 (7.9%)	2 (10.0%)
Currently	2 (2.6%)	1 (5.0%)
Buprenorphine Prescription[a] *n(%)*		
Never	26 (34.7%)	4 (20.0%)
Previously	14 (18.7%)	5 (25.0%)
Currently	35 (46.7%)	11 (55.0%)
Methadone Prescription[a] *n(%)*		
Never	47 (61.8%)	13 (65.0%)
Previously	16 (21.1%)	5 (25.0%)
Currently	13 (17.1%)	2 (10.0%)
Mental Health (MH) Treatment		
Lifetime Treatment for MH *n(%)*		
No	31 (40.8%)	8 (40.0%)
Yes	45 (59.2%)	12 (60.0%)
Number Treatment Episodes for MH only *m(sd)*	2.4 (3.8)	1.6 (2.6)

MH, mental health; OUD, opioid use disorder
Note: T-test conducted to compare means; Pearson's chi-squared test conducted to compare counts; no significant differences between the full and subsample, all p's>0.05
[a] Prescribed anywhere in the United States, not necessarily in New Hampshire

SUMMARY

Participants had high rates of past opioid and mental health treatment. Over 90% (69) of participants had received treatment for their opioid use during their lifetime. More participants had received prescriptions for buprenorphine than methadone or naltrexone. Almost 60% (45) of participants had received mental health treatment. Again, there were no significant differences in previous treatment history variables between the full and subsample.

SURVEY RESULTS: OPIOID CONSUMERS

TABLE 5. OVERDOSE HISTORY AND NARCAN USE

Overdose History	Full Sample (n=76)	Subsample (n=20)
Lifetime Overdose *n(%)*		
No	23 (30.3%)	7 (35.0%)
Yes	53 (69.7%)	13 (65.0%)
Number of overdoses *m(sd)*	3.0 (3.7) (Range: 0-20)	2.9 (2.9) (Range: 0-8)
Percent of overdoses caused by *n(%)****		
Heroin only	78 (34.5%)	31 (54.4%)
Fentanyl only	32 (14.2%)	10 (17.5%)
Heroin and Fentanyl combination	68 (30.1%)	14 (24.6%)
Other	48 (21.2%)	2 (3.5%)
Received Narcan[a] *n(%)*		
No	20 (37.7%)	4 (30.8%)
Yes	33 (62.3%)	9 (69.2%)
Number of Narcan administrations per overdose[b] *m(sd)*	3.0 (1.6) (Range: 1-7)	2.2 (1.7) (Range: 1-4)

Note: T-test conducted to compare means; Pearson's chi-squared test conducted to compare counts
[a] Of consumers who reported having an overdose, Full Sample (n=53), Subsample (n=13)
[b] Of consumers who reported receiving Narcan, Full Sample (n=33), Subsample (n=9)
***χ^2=21.4, p<0.001, all other p's>0.05

SUMMARY

Seventy percent of participants in this sample had overdosed. Of those participants who had overdosed, 62% received naloxone (Narcan) to reverse their overdose. These participants reported needing an average of 3 doses of Narcan to reverse their overdose, which is higher than the average number of Narcan doses estimated by responders (Table 6). Participants in the subsample had significantly fewer overdoses caused by "Other" drugs, in comparison to participants in the full sample.

SURVEY RESULTS: RESPONDER AND ED PERSONNEL

SURVEY RESULTS: RESPONDER AND ED PERSONNEL

TABLE 6. FIRST RESPONDER AND ED PERSONNEL CHARACTERISTICS

Demographics	Overall (n=36)	Subsample (n=12)	Police (n=6)	Fire (n=6)	EMS (n=6)	Emergency Department (n=18)
Age years *m(sd)*	42.5 (9.6)	47.8 (7.2)*	41.8 (7.0)	42.2 (11.2)	44.8 (10.8)	42.0 (10.1)
Gender						
Male	29 (80.6%)	10 (83.3%)	5 (83.3%)	6 (100%)	6 (100%)	12 (66.7%)
Female	7 (19.4%)	2 (16.7%)	1 (16.7%)	0 (0%)	0 (0%)	6 (33.3%)
Race *n(%)*						
Black/African American	1 (2.8%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (5.6%)
White	34 (94.4%)	11 (91.7%)	6 (100%)	6 (100%)	6 (100%)	16 (88.9%)
Multiracial	1 (2.8%)	1 (8.3%)	0 (0%)	0 (0%)	0 (0%)	1 (5.6%)
Ethnicity *n(%)*						
Hispanic and Latino	2 (5.7%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (11.1%)
Not Hispanic or Latino	33 (94.3%)	11 (100%)	5 (100%)	6 (100%)	6 (100%)	16 (88.9%)
Years employed *m(sd)*	12.9 (8.8)	18.5 (8.5)**	17.2 (7.3)	18.4 (10.9)	18.3 (9.1)	7.9 (5.6)
How many overdoses have you responded to? *Median (range)*	78 (4-1000)	219 (30-1000)	62 (24-1000)	58 (40-100)	88 (36-1000)	100 (4-450)
How many times have you administered Narcan? *m(sd)*	52 (107)	89 (175)	0 (0)	33 (17)	157 (235)	30 (37)
Average Narcan dose per patient[a] *m(sd)*	1.6 (0.8)	1.7 (1.0)	N/A	1.9 (1.2)	1.6 (0.5)	1.7 (0.6)

Note: T-test conducted to compare means; Pearson's chi-squared test conducted to compare counts; statistically significant difference between subsample and full sample, *p<0.05, **p<0.001, all other p's>0.05

[a] One dose of Narcan was defined as 0.4 mg administered intravenously and 2 mg administered intranasally.

SUMMARY

Overall, responders were predominately non-Hispanic, white males. Responders had been employed for over a decade on average and had extensive experience treating overdoses. All fire, EMS, and ED personnel had administered Narcan to patients on multiple occasions, though no police officers had ever administered Narcan. EMS, ED, and fire personnel estimated that they currently needed to administer more than one dose of Narcan per patient. The responders selected for the qualitative subsample were comparable to the full sample on gender, race, ethnicity, and experience treating overdoses. The subsample was significantly older and had more years of employment than those responders included only in the full sample.

INTERVIEW FINDINGS BY CATEGORY

OVERVIEW

The following sections are divided by the ten categories targeted during the interviews with consumers, first responders, and ED personnel and the themes that emerged from each: (1) Trajectory of opioid use, (2) Formulation of heroin and fentanyl, (3) Fentanyl-seeking behavior, (4) Trafficking and supply chain, (5) Experiences with overdoses, (6) Experiences with Narcan, (7) Harm reduction, (8) Treatment, (9) Prevention, and (10) Laws and policies.

For the duration of the report, the following acronyms should be noted:

FLH – Fentanyl-laced Heroin

R/ED – First Responder and/or Emergency Department Personnel

INTERVIEW FINDINGS BY CATEGORY: TRAJECTORY OF OPIOID USE

Trajectory of Opioid Use

OPIOID CONSUMERS

Early experimentation with substance use (e.g., ***"I smoked pot at 8"; "I drank a little bit when I was 12"***) was endorsed by the vast majority of interviewees when asked to talk about their path to opioid use. Severe injuries (e.g., brutal dog attack requiring 200 stitches to the face, 2 broken legs due to motorcycle accident, double hip replacement at 13 years of age) warranting prescription opioid therapy (chronic opioid therapy in several cases) for associated pain were cited pervasively as what, ***"kind of started it," "might have triggered the beginning of it [opioid seeking behavior] … it got my brain running."*** A subset of those endorsing a legitimate prescription for opioids point to the abrupt termination and/or steep taper of their prescription by their doctors as the reason for turning to the ***"street pharmacy"*** (see pull quote).

Many consumers prominently featured substance use among nuclear family members, including intergenerational substance use, in their responses to questions about how it all started. That family substance use eliminated barriers to accessing drugs, and signaled a permissive environment in which to initiate drug use, is evident in the following remarks:

"the first time I used cocaine was with my mother"

"my brother introduced me to heroin"

"when I was born, my father was a heroin addict"

"[at age 8] my brother thought it would be funny to get his little sister high"

"With our huge opiate dilemma… with doctors afraid to prescribe pain medicine to people, they were very short with me and the pain med. They weren't really taking care of me enough, and my insurance wouldn't cover me to get into a good pain clinic, so I was kind of flying on one wing. I was still in a lot of pain, so what they ended up making me do was look for other people that had pain meds so I could just be right… next thing I knew [heroin/fentanyl mix] was in front of me."

INTERVIEW FINDINGS BY CATEGORY: TRAJECTORY OF OPIOID USE

Finally, several consumers underscored the significance of unmanaged mental health issues (e.g., ***"it all just progressed because my depression got worse and worse"***) as contributing meaningfully to a trajectory of opioid use.

Significantly, these risk factors intersect, overlap, and compound each other in all but a handful of cases (see Figure 6). For example, one young woman cites a Percocet prescription following a cesarean section as the ***"start of everything,"*** yet she also mentions ***"dabbling"*** with substances (i.e., alcohol, marijuana, cocaine, and inhalants) starting at age 15, as well as pervasive family substance use to tell her story of how her drug use started: ***"Both of my parents were raising heroin addicts… Me and my twin… I have cousins that have died of heroin overdoses; my aunts and uncles are alcoholics and drug addicts. It was in my family."***

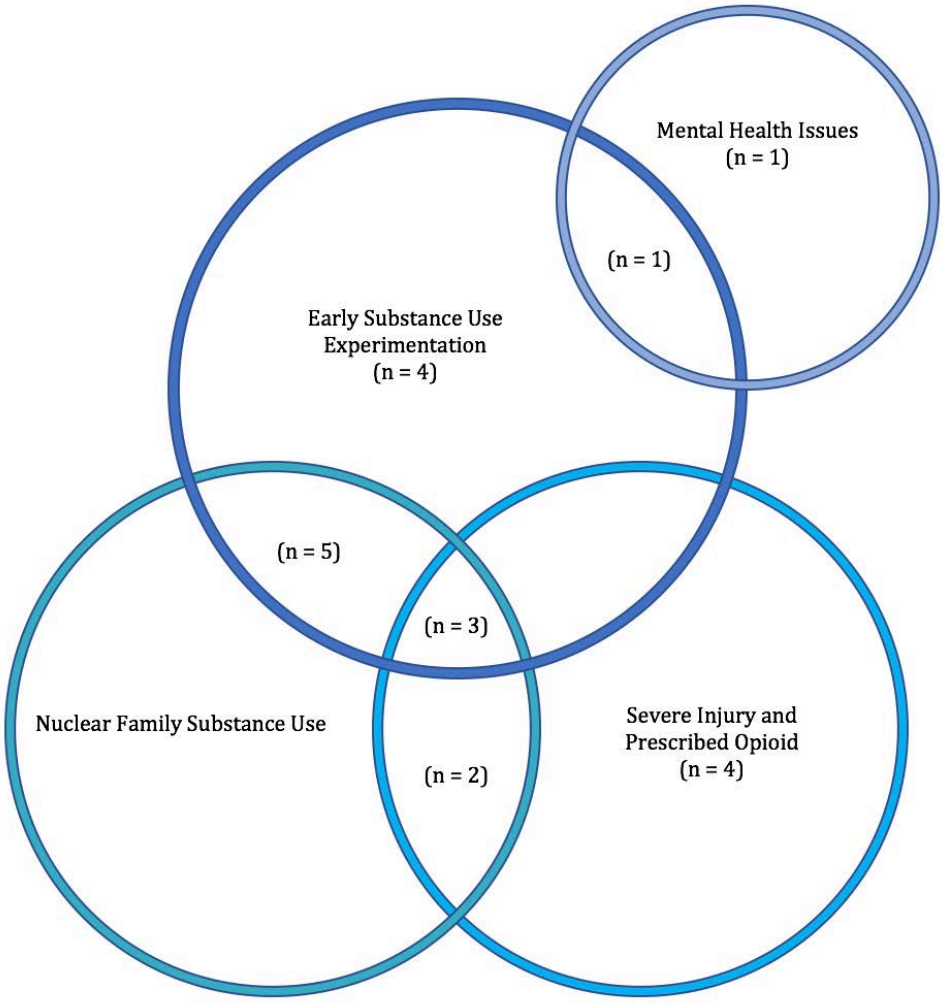

Figure 6. Risk Context for Trajectories of Opioid Use

INTERVIEW FINDINGS BY CATEGORY: TRAJECTORY OF OPIOID USE

FIRST RESPONDERS AND EMERGENCY DEPARTMENT PERSONNEL

Though most first responder and ED personnel (R/ED) lacked first-hand knowledge of opioid use trajectories, several specifically asked consumers about their ***"on-ramp to the addiction highway"*** *(ED).*

R/ED personnel believed that some consumers initiated opioid use recreationally with friends during adolescence, and acknowledged an intergenerational cycle of substance use whereby ***"parents who are drug users tend to have kids who are drug users"*** *(Police).*

R/ED personnel also discussed the path from prescription opioid use to illicit opioid use after abrupt tapers of the prescription. As one emergency department physician stated, ***"I have lately been surveying all my patients about how they got started in opiate addiction…. Many of them had a medical condition, trauma, an operation, and they got hooked"*** *(ED).*

R/ED personnel reported that changes in prescribing practices during the 1990s contributed to increased rates of opioid prescriptions for injuries or chronic pain, while recent crackdowns on prescribing may have pushed some consumers to seek heroin.

Although not prominent, some R/ED personnel mentioned that untreated mental health problems contributed to consumers' initiation of opioid use. ***"A lot of times I'm seeing it tied to mental health reasons with people, whether it be depression or whatever, people masking something else going on"*** *(Police).*

SUMMARY

The main trajectories to opioid use reported during the study were:

(1) early recreational use of substances,
(2) injuries or surgeries resulting in opioid prescriptions for pain management, and
(3) intergenerational use of opioids.

These trajectories often intersected and overlapped.

Less prominent was the trajectory of self-medicating mental health problems (e.g., depression, anxiety, or anger), as approximately 10% of consumers and 8% of R/ED personnel mentioned this as a context for opioid use initiation.

INTERVIEW FINDINGS BY CATEGORY: FORMULATION OF HEROIN AND FENTANYL

Formulation of Heroin and Fentanyl

OPIOID CONSUMERS

There is consensus across interviews that fentanyl surfaced ***"in the mix,"*** meaning mixed in or cut with heroin, between two and three years ago in New Hampshire (mid- or late 2014). Consumers overwhelmingly report being unaware or not apprised by dealers that the heroin product had been altered. However, interviewees suggest that the differences in formulation between pure heroin and fentanyl laced heroin (FLH) are manifold. The first of four primary themes highlighting how consumers discriminate between heroin, and FLH is by sight. Nearly all consumers report noticing that "heroin" started appearing lighter in color. However, one interviewee felt strongly that ***"you cannot tell by looking at it;"*** nevertheless, other clues pervasively cited by consumers enable discriminating the difference.

One long time heroin user recalled a second clue or theme regarding a difference in formulation noted by nearly all consumers. He said, ***"when the fentanyl came in, I [could] actually taste the difference between the two."*** The taste is described in different ways, but the common denominator among those specifying the taste difference is that fentanyl ***"is gonna have a much sweeter taste."*** A few consumers clarify that ***"fentanyl tends to be cut with a sugary base,"*** or ***"there's no taste, there's no smell to it, sometimes it's a little sweet, but that's only if people like cut it with like sugar or something like that. But the pure fentanyl has like no ... scent, the heroin, good heroin smells like kind of like vinegar almost, it stinks. But the fentanyl... If anything, there's no scent. It's odorless***

"[Fentanyl] is like a white beige... heroin is usually brown. They say it's white heroin but I can almost guarantee its fentanyl."

"[Heroin] was always brown, really dark brown. It's just really light now, so I'm sure most of it is fentanyl or fentanyl cut with heroin."

"Fentanyl tastes sweet as opposed to bitter, ramen noodle smelling almost... It has a sweet almost confectioner sugar taste."

"When you inject it, you can kind of taste a different chemical taste because when you inject drugs, you can always taste it in the back of your mouth. With fentanyl, it has more of a... chemical taste than heroin."

INTERVIEW FINDINGS BY CATEGORY: FORMULATION OF HEROIN AND FENTANYL

and tasteless…" Triangulating data sources, one consumer noted, ***"when you buy it, if it looks more on the white side and it has a sweetness to it, it usually means that that's what it is. … that's when you know it's mixed."***

The "high" or subjective effects associated with ingesting fentanyl or FLH is also experienced as markedly different from a heroin "high". Consumers report that it is stronger than heroin.

Beyond the blunt assessment of potency, consumers frequently commented on differences between heroin and FLH in terms of the course of the associated high. Onset is markedly "quicker" with the FLH: ***"I know from my experience when I did it [FLH] within minutes I was out… the last thing I remember I was reaching for my beer and I never made it, I hit the floor."*** And some consumers noted that ***"fentanyl [FLH] creeps up on you"***; ***"I guess how it works is the heroin will hit you first and then I guess it takes a little longer for the fentanyl to hit you but then it comes in right behind the heroin and that's when people go out."***

"It is stronger than regular heroin…"

"There's always the potential to overdose, because the fentanyl is… just so much stronger…"

"I can always tell the difference between regular heroin and heroin laced with [fentanyl]. That's why I don't like regular fentanyl. It gives me too much nausea, but mixed together, it's tolerable because the heroin's there… taking the nausea away. It's almost like someone dropped a ton of bricks on your chest and you almost lose your breath for a minute."

There is overwhelming agreement that ***"the high does not last as long as heroin."***

"it doesn't last as long as heroin, so you need to use it more and more"

"It just seems like it hits you hard, but then it seems like you're dope sick quick. I don't know if the half-life is as long as heroin, but for me, it seems like I would do bag of fentanyl. I'd probably be sick, start feeling first signs of withdrawals within like six, seven hours, but if I did heroin, I could probably 12 to 18 hours I'd be fine depending on the dose"

"It just makes you really sick after you shoot it, and you catch that habit almost immediately after shooting it."

This is not surprising, as fentanyl is a short-acting opioid (Suzuki & El-Haddad, 2017).

INTERVIEW FINDINGS BY CATEGORY: FORMULATION OF HEROIN AND FENTANYL

Subjective evaluations of the effects are mixed and fall along a continuum from ***"The high is way better… and you get way higher… you're nodded out, you lose control,"*** to ***"I don't agree that the high is better… I don't think it's much of a high if you are just instantly dead. There isn't much to enjoy. You are just a zombie. You are gone."***

However, one thing almost all consumers agree on is that ***"it's cheaper to buy fentanyl."***

> ***"I think you can get a finger of fentanyl, which is 10 grams, for around probably two hundred and something. Maybe 200 bucks. Brown you can get for 300 bucks. If you sell a gram… people sell a gram for 60 bucks and then they buy it for 200; they just made 400 bucks."***
>
> ***"If you're going to do it, everybody's looking for can you get the stuff with fentanyl in it… because the other stuff, especially in New Hampshire, you spend usually, let's see, $150, $200 to buy 10 bags of heroin. If it's not good, you could do all of that just to get high. People are spending $200 just to be high for a few hours. If it's good and it has fentanyl in it, you can get high three or four times."***

FIRST RESPONDERS AND EMERGENCY DEPARTMENT PERSONNEL

R/ED personnel were confident that consumers were overdosing on opioids but had limited knowledge about the exact opioid types and formulations. Consumers were not consistently forthcoming with providing information to responders about their opioid use. ***"The bulk of patients will kind of, if they tell you anything, will kind of tell you that what they purchased was heroin or what they think was heroin"*** *(ED).*

Despite consumer reports of heroin use, responders were largely cognizant that the heroin may be mixed with fentanyl but had little knowledge of the actual formulation of the FLH. One EMS responder explained, ***"I don't really have an awful lot of exposure to the illicit drug side of fentanyl, that I'm aware of. I could be dealing with it 99% of the time, but I'm just not aware of it. I'm not getting that feedback"*** *(EMS).*

Multiple responders had witnessed pills or powder at the scene when responding to overdoses, and reported that to be fentanyl. ***"We always go on the assumption that it's… fentanyl"*** *(EMS).* According to several police officers, the powder formulation of fentanyl was more prevalent than pills or patches: ***"It's always in the powder form up here… Some people do get fentanyl patches and buy fentanyl patches illegally… And they'll flick them down or they'll lick the gel off of them and do that. That's very rare"*** *(Police).* These pills and powder drugs were usually

INTERVIEW FINDINGS BY CATEGORY: FORMULATION OF HEROIN AND FENTANYL

snorted or injected by consumers: ***"I think we're seeing probably a 50/50 split on those that are injecting and those that are snorting now"*** *(EMS).*

Differentiating between heroin and fentanyl was also a theme of the R/ED personnel interviews. With the exception of police, responders and ED personnel usually did not handle or test the drugs found at overdose scenes so had little experience distinguishing between heroin and fentanyl. R/ED personnel learned that consumers could distinguish between heroin and fentanyl by their color, consistency, potency, and subjective feeling. Fentanyl was described as being a lighter color than heroin by several R/ED personnel. ***"We'll talk to someone on the street and they'll say, 'Well, I knew he was going to overdose because when he injected it was light'"*** *(EMS).* Consumers also reported to R/ED personnel that the subjective high was different for fentanyl. ***"Some [patients] will tell me that it feels different when they use it, so they may not perceive it when they're looking at it but after using it they feel that the two drugs are different"*** *(ED).*

SUMMARY

From the interviews with R/ED personnel, it is apparent that they report little knowledge of the formulation of heroin and fentanyl.

Conversely, consumers believe there are many ways to determine whether a substance is heroin or fentanyl, including by sight, taste, effect (strength, speed of onset, and duration of high), and cost. Overdoses are not limited to those injecting FLH, as some consumers are reporting overdosing after inhalation of the product.