



## Research paper

## Exposure to fentanyl-contaminated heroin and overdose risk among illicit opioid users in Rhode Island: A mixed methods study

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## ABSTRACT

**Background:** Illicit fentanyl use has become wide spread in the US, causing high rates of overdose deaths among people who use drugs. This study describes patterns and perceptions of fentanyl exposure among opioid users in Rhode Island.

**Methods:** A mixed methods study was conducted via questionnaire with a convenience sample of 149 individuals using illicit opioids or misusing prescription opioids in Rhode Island between January and November 2016. Of these, 121 knew of fentanyl and reported known or suspected exposure to fentanyl in the past year. Semi-structured interviews were conducted with the first 47 participants.

**Results:** Study participants were predominantly male (64%) and white (61%). Demographic variables were similar across sample strata. Heroin was the most frequently reported drug of choice (72%). Self-reported exposure to illicit fentanyl in the past year was common (50.4%, n = 61). In multivariate models, regular (at least weekly) heroin use was independently associated with known or suspected fentanyl exposure in the past year (adjusted prevalence ratio (APR) = 4.07, 95% CI: 1.24–13.3, p = 0.020). In interviews, users described fentanyl as unpleasant, potentially deadly, and to be avoided. Participants reporting fentanyl exposure routinely experienced or encountered non-fatal overdose. Heroin users reported limited ability to identify fentanyl in their drugs. Harm reduction strategies used to protect themselves from fentanyl exposure and overdose, included test hits, seeking prescription opioids in lieu of heroin, and seeking treatment with combination buprenorphine/naloxone. Participants were often unsuccessful in accessing structured treatment programs.

**Conclusion:** Among illicit opioid users in Rhode Island, known or suspected fentanyl exposure is common, yet demand for fentanyl is low. Fentanyl-contaminated drugs are generating user interest in effective risk mitigation strategies, including treatment. Responses to the fentanyl epidemic should be informed by the perceptions and experiences of local users. The rapid scale-up of buprenorphine/naloxone provision may slow the rate of fentanyl-involved overdose deaths.

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## Background

“Well, I don’t really know what it looks like.” David shifted awkwardly in his chair. He hedged his answers a few times, making an effort to separate what he knew firsthand and what he knew through rumour. He continued:

David: I’ve done, um, a couple of times I’ve done heroin, supposing it was heroin, where somebody said to me, ‘it’s got fentanyl in it.’ The times I did those two, I did like that twice, and

they told me, the people that sold it to me, it was like, I did it once and like six months later again, but it was the same deal, White, greyish, silky. And they said “be careful. It’s got a lotta bodies on it.”

JC: A lot of bodies on it?

David: Meaning, like, yea, but when I did it I was like, “Whoa! What the heck kinda dope<sup>1</sup> is this?” I never. I mean, it was like really potent. And from what I had been told through other people was like, “well, that’s fentanyl.”

JC: What does “a lot of bodies on it” mean?

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<sup>1</sup> “Dope” is a slang term used in Rhode Island (and elsewhere) to refer to heroin.

David: Oh. It's so strong it's killing people.

The use of illicit fentanyl, a synthetic opioid many times stronger than morphine (Volpe et al., 2011), among people who use drugs has become wide-spread in the last two years (United States Drug Enforcement Administration, 2016). As David describes, fentanyl has also become a significant factor in heroin-involved deaths (Rudd, Aleshire, Zibbell, & Gladden, 2016).

In the state of Rhode Island, located in the New England region of the United States, the rate of fentanyl-related overdose deaths more than doubled between 2013 and 2014, rising from 2.5 to 8.0 per 100,000 population (Mercado-Crespo, Sumner, Spelke, Sugerman, & Stanley, 2014; Rhode Island Governor's Overdose Prevention and Intervention Task Force, 2016). In 2015, Fentanyl was implicated in 122 of the 258 fatal overdoses—approximately 50% of all overdose deaths in the state (Rhode Island Governor's Overdose Prevention and Intervention Task Force, 2016). In response to this trend, the Rhode Island Governor's Overdose Prevention Task Force was formed in 2015 and tasked with identifying strategies for decreasing the rate of fatal overdose (Rhode Island Governor's Overdose Prevention and Intervention Task Force, 2015). A key element of the strategy recommended by the Task Force is increased access to buprenorphine/naloxone, partial opioid antagonist used as a medication for addictions treatment (Wake-man, 2017), sometimes called medication-assisted treatment (MAT), an effective treatment for opioid use disorder (Mauger, Fraser, & Gill, 2014) that reduces drug-related harm and risk of overdose death (Otiashvili et al., 2013).

Despite fentanyl's significant impact on rates of overdose in Rhode Island, the effects of fentanyl exposure on perceptions of drug use-related risk and the variety of risk reduction strategies used by consumers of illicit or diverted opioids are not well understood. A recent study among young adults in the state who use prescription opioids non-medically found that 11% reported known or suspected fentanyl exposure through contaminated drugs in the past six months (Macmadu, Carroll, Hadland, Green, & Marshall, 2017), indicating that fentanyl is reaching a wide spectrum of opioid users in the region. However, without more knowledge about the local drug market and drug use behaviours in the context of pervasive fentanyl exposure, policy-makers are limited in their ability to identify and target the individuals at the greatest risk of overdose. To quell the current overdose epidemic, it is essential to identify those most at risk of fentanyl exposure and fentanyl-related overdose, as well as to identify effective points of intervention to increase access to and uptake of potentially life-saving tools like buprenorphine/naloxone. In the present mixed methods study, we used convergent exploratory and explanatory methods (Fetters, Curry, & Creswell, 2013) to describe patterns of illicit fentanyl use and the characteristics, perspectives, and experiences of individuals exposed to fentanyl in Rhode Island.

## Methods

### *Subject recruitment*

Subject recruitment and data collection for this study took place between January and November 2016. Eligible participants met the following criteria: at least 18 years of age; current resident of Rhode Island; able to provide verbal consent; and self-reported misuse of opioids (this includes the use of illicit opioids; the use of diverted prescription opioids; or the deliberate misuse of opioids received through a prescription, often called self-diversion) in the previous 30 days. Participants were recruited through targeted canvassing at local needle exchange programs, harm reduction outreach programs, emergency departments, and community-based health clinics.

Recruitment took place with the assistance of medical and counselling staff at these partnering community organizations. Staff would reach out to clients they believed to qualify for this study either by phone or as those clients presented at their respective organizations for support and services. Clients would be invited to visit the organization or were recruited from organization grounds on a day when a researcher was present and available (and situated in a private space, like an exam room, away from contact with clients seeking direct services). Staff members would then personally introduce interested participants, at which point the staff would return to their post and the researcher would invite the potential participant to undergo the informed consent process in a private space temporarily allocated for this purpose. Consent was obtained verbally. The first 47 subjects were offered \$20 for completing a written survey and participating in a semi-structured interview immediately following. The subsequently recruited participants in this study were offered \$10 compensation for completing the written survey only.

### *Data collection*

All consenting participants completed an anonymous written survey designed to capture demographic information as well as information pertaining to substance use, prescription drug diversion, experience with overdose, access to naloxone, and access to treatment. The use of any substance more than once per week was considered "regular" use. Most items were derived from prior cross sectional studies (Bazazi, Yokell, Fu, Rich, & Zaller, 2011; Yokell, Green, Bowman, McKenzie, & Rich, 2011; Yokell, Zaller, Green, McKenzie, & Rich, 2012). Known or suspected exposure to fentanyl in the past year was measured according to self-report. Specifically, we asked participants whether they had (in the past year) knowingly or intentionally consumed fentanyl or if they held a strong belief that they had consumed fentanyl-contaminated drugs based on the physical sensation of the drugs or on information obtained from their supplier after the fact. A positive response to either of question was considered known or suspected fentanyl exposure. Additionally, participants were asked whether they had ever experienced a non-fatal overdose and, if yes, when their most recent overdose experience occurred. Using these measures, participants who reported experiencing a non-fatal overdose in the past year were identified and this binary variable used in our statistical analyses. All participants were given the option of completing the survey independently or having the survey administered verbally by the researcher.

The first 47 participants who completed this written survey also participated in a qualitative interview. A semi-structured interview guide was used to elicit personal histories with substance use, drug treatment, and overdose, as well as perceptions of and recent encounters with fentanyl and fentanyl-contaminated drugs. Interviews, which ranged from approximately fifteen minutes to fifty minutes in length, were audio-recorded and transcribed for analysis. Participants were encouraged to share personal experiences and offer their own insights into their choices related to opioid use and treatment seeking. All surveys and interviews were conducted in English [by J.C.]. Instruments are available by request from the first author.

### *Statistical analysis*

Descriptive statistics were generated for all demographic factors as well as patterns of substance use, incarceration, overdose, and treatment seeking. We calculated prevalence ratios (PRs) of demographic and behavioural variables to identify factors associated with known or suspected exposure to fentanyl in the past year. Due to the high prevalence of this outcome, a modified

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