Findings from Nonfatal Opioid Overdose Case Investigations

Maricopa County Department of Public Health

October 2022

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Background

In 2017, Arizona issued a statute that required all suspected opioid overdoses to be reported to the local health department. Through funding from CDC's Opioid Data to Action Grant, the Maricopa County Department of Public Health (MCDPH) launched a case investigation program, mirroring the response for most other mandated disease reports. In March 2021, MCDPH began case investigations of suspected nonfatal opioid overdoses reported by Maricopa County hospital facilities.

This report summarizes the data collection period of 9/1/2021 through 8/31/2022.

Facilities report suspected opioid overdoses through the statewide Medical Electronic Disease Surveillance Intelligence System (MEDSIS). In addition to patient details, MEDSIS includes fields for the hospital reporter to provide details on the overdose event (location of event, intentionality, toxicology, naloxone administration prior to arrival, referrals made); however, often reports are incomplete and missing key information.

To prioritize cases for outreach with a limited team capacity, MCDPH Epidemiology Investigators use the information in MEDSIS to identify cases that meet internal sampling criteria: (1) Cases are selected from two major hospital systems; (2) The case-patient must be 18 years of age or older; (3) Cases with fatal outcomes are excluded; (4) Cases where the report indicates that the overdose was intentional are excluded unless there is a documented history of prior substance use; (5) Based on information reported by the hospital, the Investigator then classifies the case using the CSTE nonfatal opioid overdose case definition.[1] Only confirmed and probable cases are then investigated.

Key Takeaways

Prevention strategies should focus on strengthening linkage to care and harm reduction education at hospitals.

Naloxone access is still an important gap, with 50% of the respondents reporting access to naloxone.

Smoking and snorting were the most common methods of drug administration reported.

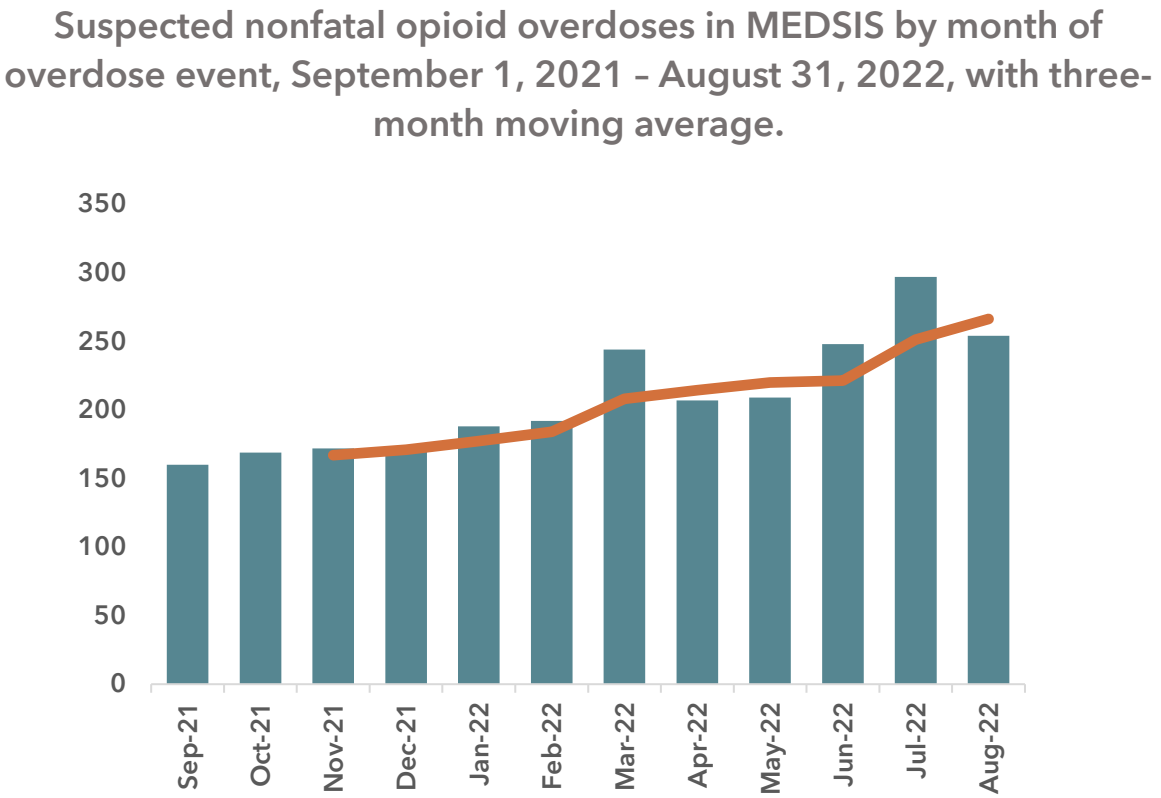
MCDPH uses its own investigation form housed in Qualtrics to conduct the interview. This allows for additional information not captured in MEDSIS to be recorded and allows for the incorporation of educational prompts based on certain responses. Interview questions include details surrounding the overdose event, knowledge of harm reduction strategies, substances used, and interest in treatment. Throughout the interview, investigators provide harm reduction education; for example, if an individual does not have access to naloxone because they don't know what it is, the Investigator will provide information on its uses and where it can be obtained. If the patient is interested in substance use treatment, the investigator can also conduct a warm transfer to Arizona's Opioid Assistance and Referral Line (OAR), a 24/7 hotline which among many services offered, can connect the patient to substance use treatment services.

Between September 1, 2021, and August 31, 2022, MCDPH received 2,466 suspected nonfatal opioid overdose case reports in MEDSIS. Among these reports, 1,387 cases met sampling criteria (56.2%); 1,238

[1] https://cdn.ymaws.com/www.cste.org/resource/resmgr/ps/ps2022/19-CC-01_FINAL_appendices_up.pdf

(50.2%) were eligible for investigation; investigators contacted and abstracted hospital report information for 1,058 case-patients; 734 (69.4%) were lost-to-follow up; and 324 (30.6%) were successfully interviewed. Among cases that were successfully interviewed, 179 (55.2%) case-patients self-reported recreational drug use and 145 did not (44.8%).

The graph below shows MEDSIS suspected nonfatal opioid overdose events that occurred between September 1, 2021, and August 31, 2022. The average monthly suspected nonfatal opioid overdoses increased from about 167 per month during September-November 2021 to 266 during June-August 2022.



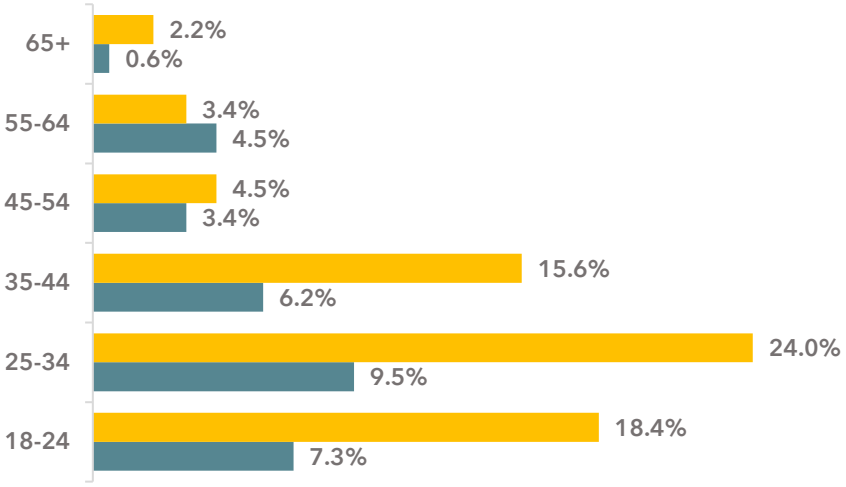
This report summarizes data from the 179 interviews conducted with case-patients who self-reported recreational drug use. This was done to better interpret the findings and to specifically help inform overdose prevention interventions for people who use drugs.

While not the focus of this report, there are also overdoses among people who do not use drugs recreationally, especially among older adults who have an opioid prescription. Prevention strategies for this group should focus on co-prescribing naloxone with opioid prescriptions and helping patients and their friends/family members recognize the signs of an opioid overdose.

Demographics

Overall, respondents were 68.7% male and the 25-34 age group accounted for the largest proportion of those interviewed (33.5%). The median age of respondents was 30 (IQR: 16 *24-40*) and 81.0% were under the age of 45. This does not differ substantially from the demographics available on all adult MEDSIS cases reported during this period which was 67.1% male and 36.1% were ages 25-34.

The largest proportion of interview respondents was among males ages 25-34.



Individuals who identified as Hispanic or Latino accounted for the largest race/ethnicity category at 44.1% of respondents, whereas about two-fifths of respondents (40.2%) identified as White Non-Hispanic. These numbers are difficult to compare to all MEDSIS reports of suspected nonfatal overdoses, since about 21% of case data in MEDSIS are missing race/ethnicity information.

15.6% of respondents reported experiencing homelessness or unstable housing. About a fifth of respondents (21.0%) reported being incarcerated at some point in the six months prior to the overdose event. These findings highlight that overdose prevention strategies that better reach people experiencing homelessness or unstable housing as well as strategies that partner with correctional facilities for linkage to care or overdose prevention resources could be very impactful. MCDPH plans on further exploring the needs and gaps in care for these sub-populations of people who use drugs in future projects.

Because these interviews are conducted telephonically, individuals with unstable housing may be less represented in the interview sample as they may be more difficult to reach.

See Appendix Tables 1 and 2 for full demographic details.

Overdose Event Information – Hospital Report

Even if an interview with a case-patient is unsuccessful, some information can be abstracted from the MEDSIS report. Investigators record any linkage to care that occurred at the hospital *if it is documented.* 2.4% had documentation of naloxone being provided upon discharge from the hospital, and just over a third (35.5%) had documentation of naloxone being prescribed. 15.3% had documentation of a referral to substance use treatment. While it is possible that this information is not always well documented, patient reports {detailed later in this report} correlate with these data. This corroboration suggests an opportunity for hospitals to provide resources that extend beyond educational literature, in particular naloxone distribution upon discharge. This could include naloxone distribution to family or friends that pick up the patient from the hospital.

Investigators also record any toxicology information that is available within the MEDSIS report. Toxicology is often not conducted at the hospital. 47.2% did not have toxicology performed at the hospital. Additionally, when toxicology is conducted at the hospital, it is more common for hospitals to conduct urine drug screening. Though urine drug screens are considered enough evidence to support a confirmed classification per the CSTE nonfatal opioid overdose case definition, there are limitations in interpreting results for the surveillance of specific drugs. Urine drug screening can yield false positives and cannot detect all drugs (e.g., fentanyl is not easily detected). Some drugs, such as amphetamines, can also be detected in urine for up to a week, which makes interpretation difficult.

Among those with toxicological testing performed (N=65), the most common substances detected were fentanyl and amphetamines/methamphetamines (47.7% and 46.2%, respectively); 16.9% tested positive for both. Just 4.6% had positive results for Oxycodone. These findings are consistent with fatal overdose toxicology data in Maricopa County, where 64.1% of fatal overdoses involved fentanyl, 51.9% involved methamphetamines, and 28.1% involved both in 2021.

Alcohol was detected in 8.9% of case-patients. A little over three-quarters (76.9%) of those with toxicology performed tested positive for two or more drugs. Education should focus on avoiding drug combinations that can increase one's risk of an overdose.

The majority (83.1%) of case-patients had documentation of naloxone being administered prior to arrival at the hospital. Among those who received naloxone (N=103), Emergency Medical Services were most frequently cited as having administered the naloxone (67.0%). Because information on naloxone administration is obtained from the hospital report, details on what occurred prior to EMS arrival will be minimal or more likely, unknown. This may impact some of these findings. For example, if the patient was using drugs with someone else and naloxone was administered, this might not be well documented. Thus, though bystanders, friends, and family account for a smaller percentage of naloxone administration (13.6%) compared to EMS (67.0%), messaging promoting the carrying of naloxone should not be discounted.

See Appendix Tables 3-5 for details on medical record documentation.

Overdose Event Information - Interview

Most overdoses (56.4%) were reported to occur at a home or private residence. A little less than half of respondents reported this to be their first experienced overdose (46.9%).

Most (67.6%) reported that they were *not* alone at the time of the overdose. While this is a positive finding, there is still an important opportunity to provide education about the importance of not using alone as well as promoting services such as "Never Use Alone", a hotline that can monitor a person while they are using drugs and call for help if the person does not respond after some time. While MCDPH only investigates nonfatal opioid overdoses, if feasible, it would be worthwhile to compare this finding to fatal overdose data to examine if being with others is a protective factor in nonfatal overdoses in Maricopa County.

About a tenth of respondents (10.1%) reported having a prescription for an opioid in the three months prior to the overdose event. MCDPH has attempted to validate self-reported data on opioid prescriptions among those with a nonfatal opioid overdose by working with Epidemiology staff at the Arizona State Board of Pharmacy (ASBP), the organization which manages Arizona's Prescription Drug

Monitoring Program (PDMP) data. While MCDPH cannot access line-level patient PDMP data, each month MEDSIS nonfatal overdose reports are sent to the ASBP Epidemiologist who then matches the nonfatal opioid overdose data to the PDMP and sends MCDPH an aggregate report. In 2021, an average of 13% of *all* patients from suspected nonfatal opioid overdoses had a prescription for an opioid recorded in the Arizona PDMP in the three months prior to their overdose event.

See Appendix Table 6 for overdose event details.

Health

Respondents were asked about two co-morbidities that have an increased risk among people who use drugs, HIV and Hepatitis C. 11.2% reported having a diagnosis for Hepatitis C at some time in their life. Among those who reported ever having a Hepatitis C diagnosis (N=20), the majority reported never being treated for Hepatitis C (80.0%). This could potentially be explained by barriers to Hepatitis C treatment in Arizona, such as a previous Medicaid requirement in Arizona which required three months of sobriety for enrollees to be eligible to receive Hepatitis C treatment, a requirement which was removed in late 2021.

Respondents were also asked about their history of Hepatitis C testing. Among those who did not report ever having a Hepatitis C diagnosis (N=159), about two-fifths (40.9%) had never been tested for Hepatitis C or did not know if they had ever been tested. Additionally, for those who had never been tested or who had been tested over a year ago[2] (N=97), 38.1% did not know where to go in the community to get tested for Hepatitis C. These findings underscore the continued hepatitis C syndemic among people who use drugs and reinforce the need to prioritize better Hepatitis C testing and linkage to treatment.

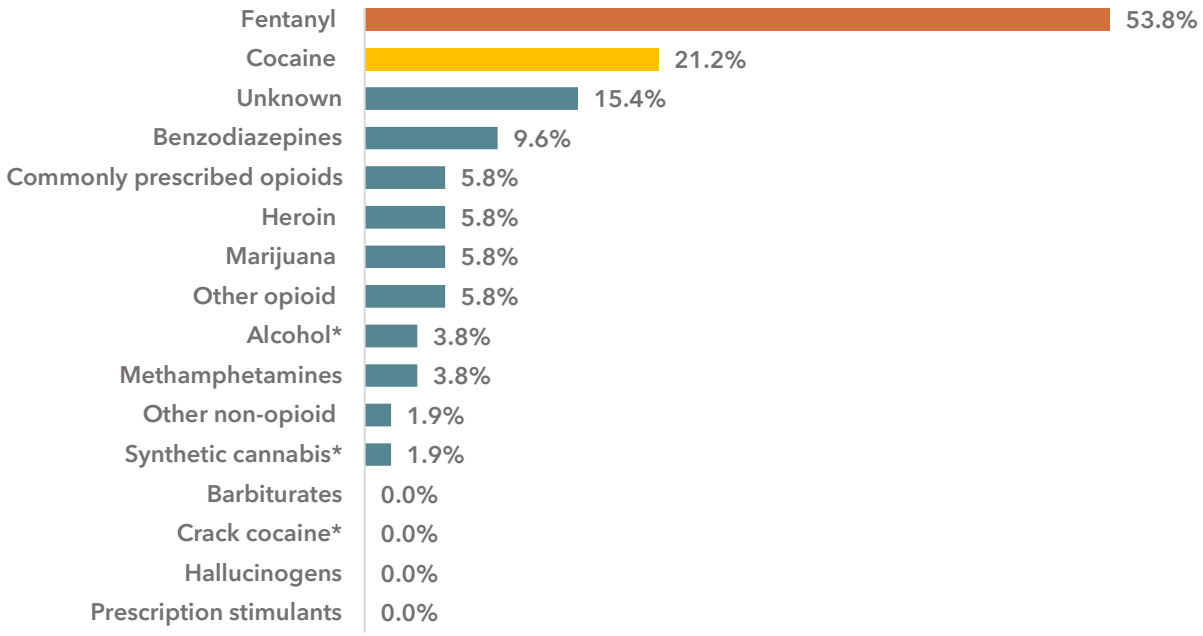
See Appendix Table 7 for health details.

[2] The CDC recommends Hepatitis C screening at least once in a lifetime for all adults aged 18 years and older. Routine periodic testing is recommended for people with ongoing risk factors, which includes people who currently inject drugs.

Drug Use

To distinguish between which drugs respondents thought they were using, and which drugs were being used according to toxicology data, a survey question was revised in March 2022 to ask respondents about the drugs they were *intending* to use on the date of the overdose event. The three most common drugs that were recalled being used on the day of the overdose event (N=52) were fentanyl (n=28; 53.8%), cocaine (n=11; 21.2%), and benzodiazepines (n=5; 9.6%).

Fentanyl and cocaine were the most common drugs intended for use on the day of the overdose.



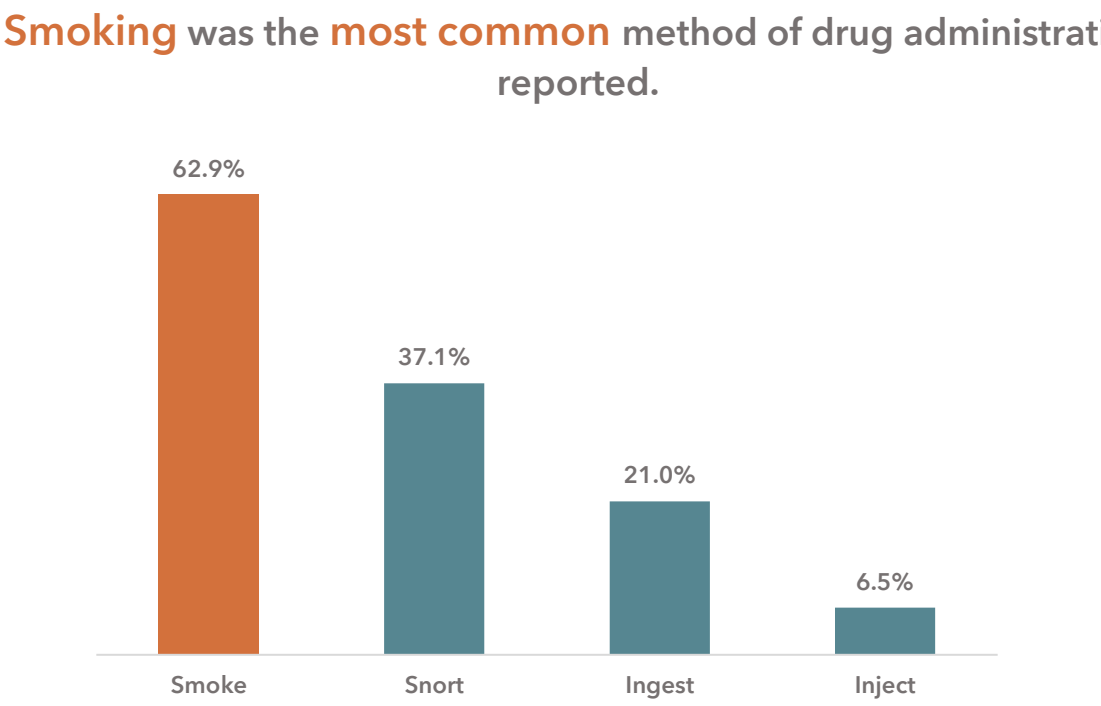
Of note is that amphetamines/methamphetamines, though the second most common toxicology result, was not one of the most reported drugs used on the day of the overdose event. Among those with amphetamine/methamphetamine toxicology results (N=30), fentanyl was still the most common drug reported to be used on the date of the overdose. This again likely points to a limitation with urine drug screens which can detect amphetamines for up to a week.

Respondents were asked a series of follow-up questions about their recreational drug use. Fentanyl was the most common drug reported to be used recreationally (n=112; 62.6%). Other commonly used drugs were marijuana (n=58; 32.4%), methamphetamines (n=54; 30.2%), cocaine (n=37; 20.7%), and commonly prescribed opioids (n=32; 17.9%).

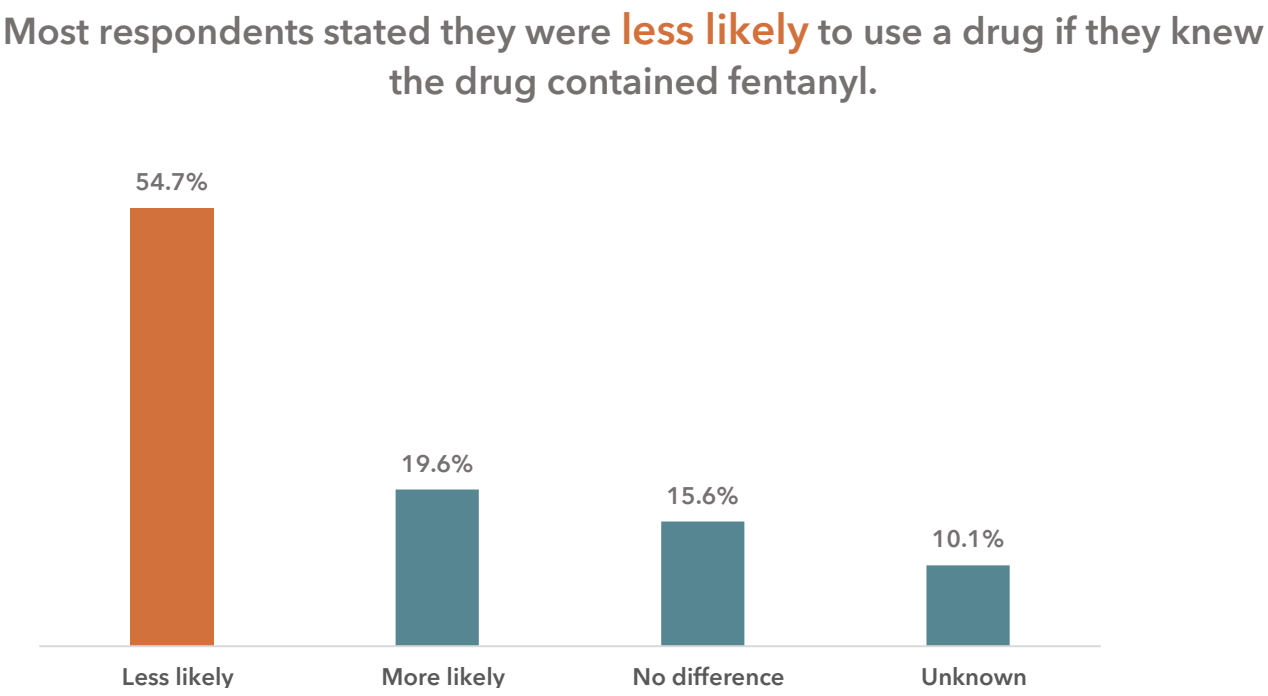
Looking specifically at those whose recreational drug use excluded fentanyl and who did not intend to use fentanyl on the day of the overdose (N=65), cocaine (n=23; 35.4%) and commonly prescribed opioids (n=21; 32.3%) were the drugs most frequently reported to be used recreationally. Methamphetamine use was less frequently reported among those who did not report the recreational use of fentanyl (n=13; 20.0%) compared to those who reported recreational fentanyl use (36.0%). Those who did not report the recreational use of fentanyl also had a higher proportion of individuals who

identified as Black compared to those who reported recreational fentanyl use (15.4% vs. 5.3%) and were slightly older, with a median age of 35 compared to 29. Additionally, those who did not report the recreational use of fentanyl were more likely to report this as their first overdose (66.2% vs. 36.0%), were less likely to have naloxone access (36.9% vs. 58.8%), and were more likely to report snorting their drugs (50.0% vs. 30.0%). With the increasing prevalence of fentanyl in the drug supply, overdose prevention messaging should be inclusive of all types of drug use.

Smoking (62.9%) and snorting (37.1%) were the most common methods of drug administration reported, while injection (6.5%) was the least common method reported. Among those who reported injecting drugs (N=8), three-quarters (75.0%) stated they had used non-sterile equipment at some point in the past. This information can be helpful for agencies that distribute harm reduction supplies in the community. Harm reduction strategies should incorporate education and materials for safer smoking/snorting without neglecting the importance of sterile equipment for injection.



Individuals were also asked about their preferences around using fentanyl. Responding to the question, *"If you know a drug contains fentanyl are you more or less likely to use it?"* over half of respondents (54.7%) indicated that they were less likely to use fentanyl, 19.6% were more likely, and 15.6% stated there was no difference.



In discussions with the Investigators who conduct the interviews, some of the questions about recreational drug use can have different interpretations among case-patients. For example:

- *The case-patient might report fentanyl use recreationally because they were told they tested positive for fentanyl.*
- *For the question about the likelihood of using a drug if the patient knows fentanyl is present, many respondents answer this question from their current perspective, meaning that even if they had chosen to use fentanyl recreationally in the past, they may feel less inclined to do so following their overdose event. This may help to explain why among those who reported using fentanyl recreationally (N=114), 40.4% said they were less likely to use fentanyl if they knew it was in their drug; 29.0% said more likely; and 21.9% said it made no difference.*
- *Drugs are sometimes viewed on a scale akin to class and some respondents may be reluctant to identify themselves as a person who chooses to use a specific type of drug.*

See Appendix Tables 8- 10 for details on drugs used.

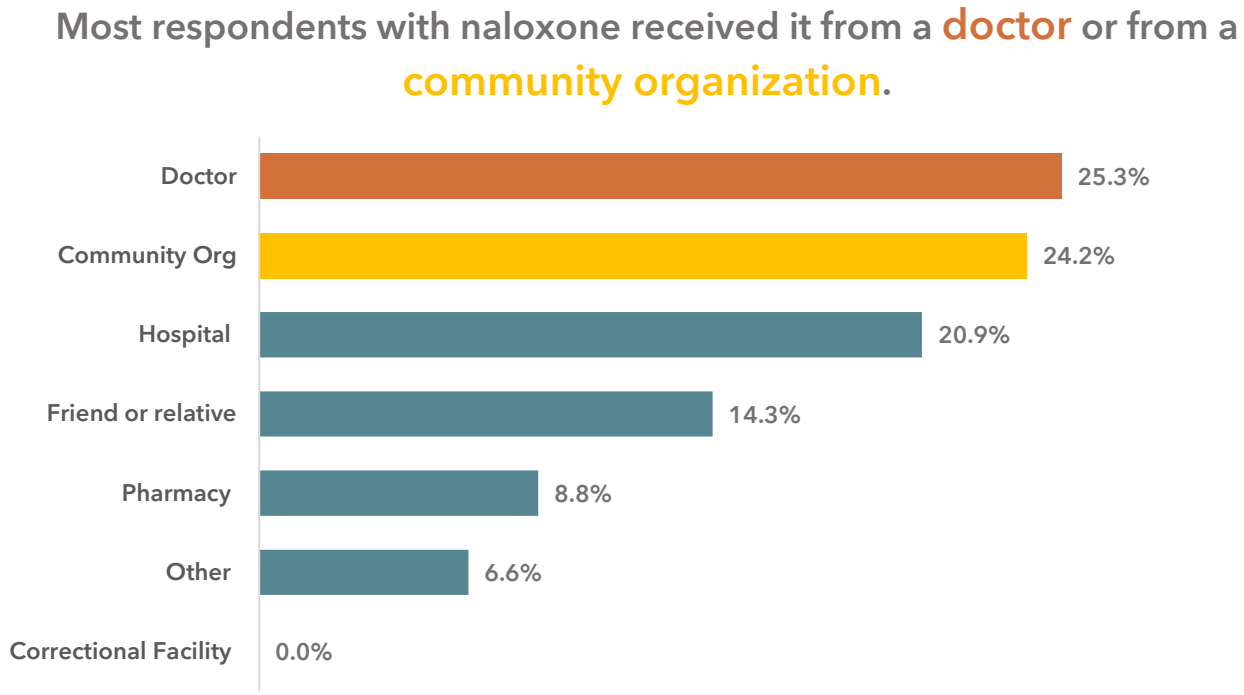
Harm Reduction - Naloxone

About half (50.8%) of respondents reported having access to naloxone at home, highlighting that naloxone access is still an important gap. Naloxone access was greater among females than among males (60.7% vs. 46.3%). Additionally, naloxone access was lowest among Hispanics (44.3%).

Among those who reported having access to naloxone at home (N=91), the majority reported that they received it from their doctor (n=23; 25.3%), followed by a community organization (n=22; 24.2%). Receiving naloxone from the pharmacy was reported by just 8.8% (n=8) of respondents. One common barrier anecdotally reported to the Investigators conducting interviews is that many pharmacies seemed

to be unaware of the standing order for naloxone in Arizona, resulting in individuals sometimes being turned away at pharmacies.

For those that reported receiving naloxone elsewhere, most of the respondents reported receiving it from a substance use treatment facility. Another interesting finding is that none of the respondents reported receiving naloxone from a correctional facility despite 21.0% reporting being incarcerated at some point in the six months prior to their overdose.



Interview respondents who reported *not* having access to naloxone (N=88) were also asked about whether they were offered any naloxone from the hospital following their overdose. Most of these respondents (79.6%) reported that they did not receive naloxone upon discharge, nor did they receive a prescription. The respondents who were provided a prescription for naloxone were also unlikely to obtain it. Among all respondents who reported being prescribed naloxone (N=14), 85.7% did not obtain it from the pharmacy. Though only three individuals reported receiving naloxone from the hospital, all three accepted the naloxone. To remove potential barriers, hospitals should aim to provide naloxone upon discharge rather than prescribing it.

Those who did not report access to naloxone and did not receive any naloxone from the hospital (N=82) were asked about the reasons they might not have naloxone. Barriers to naloxone access included not knowing where to get it (n=11; 13.4%), not believing it was needed due to not using opioids (n=7; 11.3%), and not knowing what naloxone is (n=9; 11.0%). These findings suggest that individuals would benefit from more education surrounding naloxone.

See Appendix Tables 11 and 12 for details on naloxone access.

Harm Reduction - Fentanyl Test Strips

Because there has been a lot of discussion around the utility of fentanyl test strip distribution, questions about fentanyl test strips were incorporated into interviews in May 2022. The findings from these interview questions are based on a small sample of interviews.

About half (51.6%) of respondents said they were familiar with fentanyl test strips. Among those familiar with fentanyl test strips (N=16), a quarter (25.0%) had used one at some point. For those who were familiar with fentanyl test strips and had never used one or had not always used them in the past 30 days (N=16), the main reason for not using them was wanting to use fentanyl (n=11; 68.8%). Among those that had another response (n=7; 43.8%), a few individuals reported being sober in the past 30 days and therefore not having a need to test their drugs.

These preliminary results suggest there is still a lack of familiarity with fentanyl test strips in the community. While there are individuals who use fentanyl recreationally, more targeted fentanyl test strip distribution should be explored.

See Appendix Table 13 for details on fentanyl test strips.

Substance Use Treatment

About a tenth of respondents (10.1%) reported being in a Medication for Opioid Use Disorder (MOUD) program at some point within the three months preceding their overdose event.

The majority (85.5%) of respondents reported that they did *not* receive a substance use treatment referral at the hospital. A little less than a third of respondents (31.3%) reported currently being in a substance use treatment program or having an appointment scheduled for treatment services. 17.9% of those who were in treatment stated they had received a referral at the hospital.

It's important to recognize that some individuals may have also refused a referral (if offered). Others may have not had the opportunity to be offered a referral if they left care early (i.e., against medical advice). From conversations with Investigators, patients may leave the hospital against medical advice for many reasons, including when they are unable to receive MOUD (such as methadone) or to escape symptoms of opioid withdrawal. Unfortunately, our interviews do not capture this type of granularity.

Almost one in three respondents reported currently being in substance use treatment or having an appointment scheduled for treatment.

Among those who were currently in treatment (N=56), outpatient rehabilitation programs and self-help programs (e.g., Narcotics Anonymous) were the most common types of treatment (n=18; 32.1%), followed by inpatient rehabilitation (n=13; 23.2%), while MOUD accounted for 16.1% (n=9).

Among those who were not currently in treatment and were not offered a referral to treatment at the hospital (N=112), a little over a quarter (28.6%) were interested in treatment.

Among those who were not interested in treatment (N=77), the most common reason for not being interested in substance use treatment was that the patient stated they did not need it (81.8%). Not needing treatment can have a few different meanings. Investigators have indicated that sometimes case-patients provide more detail in their response and that sometimes they say this overdose was a "one-time thing" or a "slip-up" and they do not intend on using drugs again. Another explanation offered is that the case-patient is not interested in stopping their drug use and therefore does not need treatment. Response options for this question differentiate between the patient not being ready for treatment and not needing it. An additional barrier to treatment identified among those who were not interested in treatment was inconvenient treatment center hours (n=6; 7.8%).

Future MCDPH projects will aim to explore barriers to treatment that are beyond the scope of these case investigations.

See Appendix Tables 14 and 15 for details on substance use treatment.

Linkage to care

Currently, the MCDPH case investigations program does not provide internal case management services. However, 18 individuals were directly connected with Arizona's OAR line through nonfatal overdose case investigations. All interviewed patients receive harm reduction education during the interview, which is tailored to their responses. Interviewed patients also receive a follow-up email with information on community harm reduction services, a treatment locator, OAR line information, the Never Use Alone hotline information, safer drug use education, as well as information on HIV and Hepatitis C.

Beginning on August 22, 2022, MCDPH started offering interviewed individuals a mailed harm reduction kit. Kits include fentanyl test strips, naloxone, and literature on how to use both items.

Challenges

There are many limitations to the findings summarized in this report.

The main challenge faced with this program is the high loss-to-follow-up rate. Contact information from the MEDSIS report is often incorrect. Though MCDPH utilizes people searching databases to identify other potential phone numbers associated with the patient, incorrect contact information remains an issue. This is a very difficult-to-reach population and though it is a major success to have connected with over 300 individuals in the past year, there may be significant differences in harm reduction knowledge and access to resources among the population that was *not* successfully reached. Thus, the data summarized in this report is not representative of all people who experienced a nonfatal opioid overdose in Maricopa County during this time frame.

These interviews are also conducted telephonically which can present a few issues. First, cold calls regarding a very sensitive and stigmatized topic can be very alarming for patients. Investigators employ motivational interviewing techniques to set a non-judgmental tone, but some patients may nevertheless find it difficult to trust the Investigator and answer truthfully. Telephonic interviews may also lead to less representation among particularly vulnerable sub-populations of people who use drugs, such as people experiencing homelessness or people experiencing economic hardship.

Another challenge is the risk of recall bias. Individuals may not be able to recall the exact drugs they used on the day of the overdose or whether referrals to treatment were provided on the day of the overdose.

Additionally, this survey instrument was not validated prior to use. There can sometimes be challenges in interpreting the data. Although Investigators convene regularly to discuss challenges, best practices, and methods to better standardize question interpretation, there may be some variability in how respondents interpreted questions, as noted with some of the results shared above.

Because this is an evolving program, changes are continuously made to the survey instrument. Based on team conversations, there have been a few changes to the survey instrument throughout the period summarized in this report (adding responses and questions, survey logic changes) and thus less data are available for some of the questions summarized than others.

Finally, the toxicology data presented have limitations. Most laboratories consider urine drug screens to be “preliminary” results.

Conclusions

Despite the limitations of this report, there are many important takeaways. Findings from this report bolster the need for drug overdose prevention measures and harm reduction activities such as:

- Naloxone distribution to at-risk populations and family/friends of those at risk, especially within the hospital setting or at discharge.
- Co-prescribing naloxone to those with opioid prescriptions.
- Educating patients with opioid prescriptions and their family/friends on how to recognize and prevent an opioid overdose.
- Education and training on the use of naloxone, how to administer it, and where to obtain it - even for those who prefer to use non-opioids.

- Warm hand-offs to substance use treatment.
- Support of low-threshold treatment options, which aim to remove as many barriers to treatment as possible and follow a harm reduction approach.[3]
- Harm reduction education surrounding polysubstance use, including the avoidance of drug combinations that can increase one's risk of a drug overdose.
- Distribution of sterile equipment that targets all methods of drug administration, especially smoking and snorting.
- Distribution of fentanyl test strips and training on how to test drugs for the presence of fentanyl.
- Educating pharmacies about the standing order for naloxone in Arizona.
- Educating providers and medical staff at all levels of the importance of using non-stigmatizing language.
- Pursuit of more robust confirmatory toxicology testing to better track circulating drugs and to better focus prevention and harm reduction activities.
- Increasing Hepatitis C testing and treatment among people who use drugs.

To maximize the potential of these data to inform overdose prevention strategies, MCDPH will continue to explore meaningful data linkages with partners to better understand the continuum of care for people who use drugs and any significant service gaps and to better understand risks among special populations of people who use drugs, including people experiencing homelessness.

[3] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7075734/

Appendix – Tables

Table 1. Demographics of adult MEDSIS nonfatal opioid overdose cases reported September 1, 2021 – August 31, 2022

	All MEDSIS Cases
Age Category	**N=2,361**
18-24	401 (17.0%)
25-34	853 (36.1%)
35-44	512 (21.7%)
45-54	245 (10.4%)
55-64	211 (8.9%)
65+	139 (5.9%)
Sex	**N=2,361**
Female	777 (32.9%)
Male	1,584 (67.1%)
Race/Ethnicity	**N=2,361**
American Indian or Alaskan Native	66 (2.8%)
Asian or Pacific Islander	7 (0.3%)
Black or African American	198 (8.4%)
Hispanic or Latino	490 (20.8%)
White	1,090 (46.2%)
Unknown	510 (21.6%)

Table 2. Self-reported demographics of interviewed sample

Age Category	**N=179**
18-24	46 (25.7%)
25-34	60 (33.5%)
35-44	39 (21.8%)
45-54	14 (7.8%)
55-64	14 (7.8%)
65+	5 (2.8%)
Unknown	1 (0.6%)
Sex	**N=179**
Female	56 (31.3%)
Male	123 (68.7%)
Race/Ethnicity	**N=179**
American Indian or Alaskan Native	8 (4.5%)
Asian or Pacific Islander	1 (0.6%)
Black or African American	16 (8.9%)
Hispanic or Latino	79 (44.1%)
White	72 (40.2%)
Other	2 (1.1%)
Refused	0 (0.0%)
Unknown	1 (0.6%)
Housing Type	**N=179**
Apartment or Condo	50 (27.9%)
Homelessness or Unstable Housing	28 (15.6%)
House or Personal Residence	83 (46.4%)
Medical or Behavioral Health Facility	2 (1.1%)
School	0 (0.0%)
Shelter	0 (0.0%)
Other	12 (6.7%)
Unknown	4 (2.2%)
Incarcerated within 6 months prior to overdose event*	**N=124**
Yes	26 (21.0%)
No	96 (77.4%)
Refused	0 (0.0%)
Unknown	2 (1.6%)
If incarcerated → What type of facility?	**N=26**
Jail	16 (61.5%)
Prison	10 (38.5%)
Detention	0 (0.0%)
Other	0 (0.0%)
Unknown	0 (0.0%)
If incarcerated → For how long?	**N=26**
Less than a month	12 (46.2%)
More than a month	13 (50.0%)
Unknown	1 (3.9%)

**Question was added to interviews completed after 11.24.21*

Table 3. Medical Record Documentation of Linkage to Care

Documentation of linkage to care in medical record* *(Select all that apply)*	**N=124**
Provided patient with naloxone	3 (2.4%)
Prescribed patient naloxone	44 (35.5%)
Referral to substance use treatment	19 (15.3%)
Referral to behavioral health treatment	14 (11.3%)
Provided patient with informational resources (e.g., literature)	67 (54.0%)
Patient connected with OAR hotline	0 (0.0%)
Patient provided OAR hotline info	4 (3.2%)
No documentation to above resources	30 (24.2%)

**Question was added to interviews completed after 11.24.21*

Table 4. Toxicology data from medical record among those with results*

Which drugs were positive according to drug testing? *(Select all that apply)*	**N=65**
Acetaminophen**	2 (10.0%)
Amphetamine or methamphetamine	30 (46.2%)
Barbiturate	1 (1.5%)
Benzodiazepine	15 (23.1%)
Buprenorphine**	0 (0.0%)
Cocaine	13 (20.0%)
Fentanyl	31 (47.7%)
Hallucinogen	1 (1.5%)
Heroin	0 (0.0%)
Hydrocodone**	0 (0.0%)
Hydromorphone**	0 (0.0%)
Marijuana	25 (38.5%)
Methadone	3 (4.6%)
Morphine	0 (0.0%)
Naloxone**	0 (0.0%)
Oxycodone	3 (4.6%)
Oxymorphone**	0 (0.0%)
Tramadol**	0 (0.0%)
Other opioid	10 (15.4%)
Other non-opioid	13 (20.0%)
Number of drugs detected	**N=65**
1 drug detected	15 (23.1%)
2 drugs detected	27 (41.5%)
3+ drugs detected	23 (35.4%)
Toxicology not conducted	**N=123**
	58 (47.2%)
Alcohol detected	**N=179**
	16 (8.9%)

**Due to process changes, information here is summarized for interviews completed after 11.24.21*
***Response option was added for interviews completed after 5.17.22. The denominators here are among responses collected after 5.17.22.*

Table 5. Naloxone administration prior to hospital arrival*

Naloxone administered prior to arrival?	**N=124**
Yes	103 (83.1%)
No	13 (10.5%)
Unknown	8 (6.5%)
If yes → By whom?	**N=103**
Bystander/layperson	12 (11.7%)
Emergency Medical Services	69 (67.0%)
Friend / Family of Patient	2 (1.9%)
Law Enforcement	12 (11.7%)
Other	1 (1.0%)
Other Health Care Professional	4 (3.9%)
Unknown	3 (2.9%)

**Question was added to interviews completed after 11.24.21*

Table 6. Overdose event details

Where did the overdose occur?	**N=179**
Business	9 (5.0%)
Healthcare facility	2 (1.1%)
Hotel	4 (2.2%)
Correctional Facility	4 (2.2%)
Personal Residence (Home)	84 (46.9%)
Public Place	17 (9.5%)
School	0 (0.0%)
Shelter	0 (0.0%)
Substance Use Recovery Facility	9 (5.0%)
Vehicle	21 (11.7%)
Work	6 (3.4%)
Other Private Residence	17 (9.5%)
Other	1 (0.6%)
Refused	0 (0.0%)
Unknown	5 (2.8%)
Was this the patient's first overdose?	**N=179**
Yes	84 (46.9%)
No	90 (50.3%)
Unknown	5 (2.8%)
Was the patient alone at the time of the overdose?	**N=179**
Yes	51 (28.5%)
No	121 (67.6%)
Unknown	6 (3.4%)
Refused	1 (0.6%)
Did the patient have a prescription for an opioid within three months of the overdose event?	**N=179**
Yes	18 (10.1%)
No	157 (87.7%)
Unknown	3 (1.7%)
Refused	1 (0.6%)

Table 7. Health information

Has patient ever been diagnosed with Hepatitis C?	**N=179**
Yes	20 (11.2%)
If Hepatitis C → Has patient ever received treatment for Hepatitis C?	**N=20**
Yes	4 (20.0%)
No	16 (80.0%)
If no Hepatitis C→ Has patient ever been tested for Hepatitis C?	**N=159**
Yes	94 (59.1%)
No	44 (27.7%)
Unknown	21 (13.2%)
If tested OR if ever hepatitis C→ When was the last time the patient was tested for Hepatitis C?	**N=114**
Within last six months	43 (37.7%)
6-12 months ago	17 (14.9%)
Over a year ago	49 (43.0%)
Unknown	5 (4.4%)
If never tested OR tested over a year ago → Does patient know where to go for Hep C test?*	**N=97**
Yes	59 (60.8%)
No	37 (38.1%)
Unknown	1 (1.0%)

**Question added to interviews completed after 11.24.21*

Table 8. Drugs intended to use on day of overdose

What substances was the patient *intending* to use on the day of the overdose event?* *(Select all that apply)*	**N=52**
Alcohol**	2 (6.5%)
Barbiturates	0 (0.0%)
Benzodiazepines	5 (9.6%)
Cocaine	11 (21.2%)
Crack cocaine**	0 (0.0%)
Fentanyl	28 (53.8%)
Hallucinogens	0 (0.0%)
Heroin	3 (5.8%)
Marijuana	3 (5.8%)
Methamphetamines	2 (3.8%)
Commonly prescribed opioids	3 (5.8%)
Prescription stimulants	0 (0.0%)
Synthetic cannabis**	1 (3.2%)
Other opioid	3 (5.8%)
Other non-opioid	1 (1.9%)
Unknown	8 (15.4%)
Refused	0 (0.0%)

**Due to a survey edit, responses here are limited to interviews completed after 3.23.22.*
***Response option was added for interviews completed after 5.17.22. The denominators here are among responses collected after 5.17.22.*

Table 9. Recreational drug use

Which drugs does the patient use recreationally? *(Select all that apply)*	**N=179**
Barbiturates	0 (0.0%)
Benzodiazepines	26 (14.5%)
Cocaine	37 (20.7%)
Crack cocaine**	0 (0.0%)
Fentanyl	112 (62.6%)
Hallucinogens	5 (2.8%)
Heroin	18 (10.1%)
Marijuana	58 (32.4%)
Methamphetamines	54 (30.2%)
Commonly prescribed opioids	32 (17.9%)
Prescription stimulants	1 (0.6%)
Synthetic cannabis**	0 (0.0%)
Other opioid	6 (3.4%)
Other non-opioid	2 (1.1%)
Unknown	0 (0.0%)
Refused	0 (0.0%)
Method of drug use* *(Select all that apply)*	**N=124**
Inject	8 (6.5%)
Smoke	78 (62.9%)
Snort	46 (37.1%)
Swallow	26 (21.0%)
Other	0 (0.0%)
Unknown	4 (3.2%)
Refused	0 (0.0%)
If injects drugs → Has the patient ever used a used syringe/needle?	**N=8**
Yes	6 (75.0%)
No	2 (25.0%)
If injects drugs → Does patient have access or know how to access clean equipment?	**N=8**
Yes	7 (87.5%)
No	1 (12.5%)
If patient knows a drug contains fentanyl, are they more or less likely to use it?	**N=179**
Less likely	98 (54.7%)
More likely	35 (19.6%)
No difference	28 (15.6%)
Unknown	18 (10.1%)

**Question was added to interviews completed after 11.24.21*

***Response option was added to interviews completed after 5.17.22.*

Table 10. Selected characteristics of people who reported the recreational use of fentanyl vs. people who did not

	Reported recreational use of fentanyl OR intended to use fentanyl on day of overdose	Did NOT report recreational use of fentanyl AND did not intend to use fentanyl on day of overdose
Patient sex	**N=114**	**N=65**
Female	36 (31.6%)	20 (30.8%)
Male	78 (68.4%)	45 (69.2%)
Age	**N=114**	**N=65**
18-24	31 (27.2%)	15 (23.1%)
25-34	43 (37.7%)	17 (26.2%)
35-44	24 (21.1%)	15 (23.1%)
45-54	8 (7.0%)	6 (9.2%)
55-64	6 (5.3%)	8 (12.3%)
65+	1 (0.9%)	4 (6.2%)
Unknown	1 (0.9%)	0 (0.0%)
Race/Ethnicity	**N=114**	**N=65**
American Indian or Alaska Native	7 (6.1%)	1 (1.5%)
Asian or Pacific Islander	0 (0.0%)	1 (1.5%)
Black	6 (5.3%)	10 (15.4%)
Hispanic or Latino	49 (43.0%)	30 (46.2%)
White	50 (43.9%)	22 (33.8%)
Other	1 (0.9%)	1 (1.5%)
Unknown	1 (0.9%)	0 (0.0%)
Which drugs does the patient use recreationally? *(Select all that apply)*	**N=114**	**N=65**
Barbiturates	0 (0.0%)	0 (0.0%)
Benzodiazepines	20 (17.5%)	6 (9.2%)
Cocaine	14 (12.3%)	23 (35.4%)
Crack cocaine**	0 (0.0%)	0 (0.0%)
Fentanyl	112 (98.2%)	0 (0.0%)
Hallucinogens	4 (3.5%)	1 (1.5%)
Heroin	12 (10.5%)	6 (9.2%)
Marijuana	41 (36.0%)	17 (26.2%)
Methamphetamines	41 (36.0%)	13 (20.0%)
Commonly prescribed opioids	11 (9.6%)	21 (32.3%)
Prescription stimulants	1 (0.9%)	0 (0.0%)
Synthetic cannabis**	0 (0.0%)	0 (0.0%)
Other opioid	0 (0.0%)	6 (9.2%)
Other non-opioid	1 (0.9%)	1 (1.5%)
Unknown	0 (0.0%)	0 (0.0%)
Refused	0 (0.0%)	0 (0.0%)
Method of drug use* *(Select all that apply)*	**N=80**	**N=44**
Inject	5 (6.3%)	3 (6.8%)

Smoke	65 (81.3%)	13 (29.5%)
Snort	24 (30.0%)	22 (50.0%)
Swallow	18 (22.5%)	8 (18.2%)
Other	0 (0.0%)	0 (0.0%)
Unknown	0 (0.0%)	4 (9.1%)
Does patient have access to naloxone?	**N=114**	**N=65**
Yes	67 (58.8%)	24 (36.9%)
No	46 (40.4%)	40 (61.5%)
Unknown	1 (0.9%)	1 (1.5%)
Was this the patient's first overdose?	**N=114**	**N=65**
Yes	41 (36.0%)	43 (66.2%)
No	71 (62.3%)	19 (29.2%)
Unknown	2 (1.8%)	3 (4.6%)

**Question was added to interviews completed after 11.24.21*

***Response option was added to interviews completed after 5.17.22.*

Table 11. Naloxone access

Does the patient have access to naloxone?	**N=179**
Yes	91 (50.8%)
No	86 (48.0%)
Unknown	2 (1.1%)
If yes → Where did the patient receive the naloxone? *(Select all that apply)*	**N=91**
Doctor	23 (25.3%)
Hospital	19 (20.9%)
Pharmacy	8 (8.8%)
Relative	5 (5.5%)
Friend	8 (8.8%)
Community organization	22 (24.2%)
Correctional facility	0 (0.0%)
Other	6 (6.6%)
Unknown	2 (2.2%)
If no → Why does the patient not have access to naloxone? *(Select all that apply)*	**N=82**
Do not know what naloxone is	9 (11.0%)
Do not know where to get it	11 (13.4%)
Do not know how to use it	0 (0.0%)
Do not feel comfortable using it	1 (1.2%)
Too expensive	3 (3.6%)
Difficult to carry around	0 (0.0%)
No place to store it	0 (0.0%)
Do not need it	29 (35.4%)
Do not use opioids*	7 (11.3%)
Just need to pick it up from pharmacy	5 (6.1%)
Not sure	20 (24.4%)
Other	6 (7.3%)
Unknown	6 (7.3%)

**Response option was added for interviews completed after 11.24.21. The denominator for this response option is among responses collected after 11.24.21.*

Table 12. Naloxone receipt at hospital

Was naloxone provided or prescribed at the hospital?*	N=88
Provided naloxone and accepted	3 (3.4%)
Provided naloxone and did not accept	0 (0.0%)
Provided prescription for naloxone and did not obtain	12 (13.6%)
Provided prescription for naloxone and obtained	2 (2.3%)
Provided prescription for naloxone but unknown if obtained	0 (0.0%)
Naloxone not provided	70 (79.6%)
Unknown	1 (1.1%)

**This question was not asked of individuals who already reported having access to naloxone or who reported being provided/prescribed naloxone at the hospital*

Table 13. Fentanyl test strips*

Is patient familiar with fentanyl test strips?	**N=31**
Yes	16 (51.6%)
No	15 (48.4%)
Unknown	0 (0.0%)
If familiar with fentanyl test strips → Has patient ever used fentanyl test strips?	**N=16**
Yes	4 (25.0%)
No	12 (75.0%)
If they have ever used → How frequently has patient used fentanyl test strips in the past 30 days?	**N = 4**
Always	0 (0.0%)
Most of the time	0 (0.0%)
Some of the time	0 (0.0%)
Never	4 (100.0%)
Unknown	0 (0.0%)
If patient has never used OR patient use not equal to always→ Why does patient not use fentanyl test strips? *(Select all that apply)*	**N=16**
Cost	0 (0.0%)
Does not know how to use them	0 (0.0%)
Does not always have the strips on hand	0 (0.0%)
Rations strips or uses them sparingly	0 (0.0%)
Testing takes too long	0 (0.0%)
Does not want to waste drug product	0 (0.0%)
The strips do not work	0 (0.0%)
Not worried about overdose risk	0 (0.0%)
Wanted to take fentanyl	11 (68.8%)
Other	7 (43.8%)
Unknown	0 (0.0%)
Refused	0 (0.0%)

**All questions added to interviews completed after 5.17.22*

Table 14. MOUD within 90 days of overdose

In the three months prior to the overdose event, was patient engaged in medication for opioid use disorder?	N=179
Yes	18 (10.1%)
No	160 (89.4%)
Unknown	1 (0.6%)

Table 15. Substance use treatment

Upon release from the hospital, did anyone help connect the patient to substance use treatment?	**N=179**
Yes	21 (11.7%)
No	153 (85.5%)
Unknown	5 (2.8%)
Is patient currently in a substance use treatment program OR do they have an appointment made?	**N=179**
Yes	56 (31.3%)
No	120 (67.0%)
Unknown	3 (1.7%)
If currently in treatment → What type of treatment program is it? *(Select all that apply)*	**N=56**
Detox	11 (19.6%)
MAT	9 (16.1%)
Rehab outpatient	18 (32.1%)
Rehab inpatient	13 (23.2%)
Self-help group (e.g., Narcotics Anonymous)	18 (32.1%)
Other	6 (10.7%)
Unknown	0 (0.0%)
If not currently in treatment AND was not offered a referral → Is patient interested in substance use treatment services at this time?	**N=112**
Yes	32 (28.6%)
No	77 (68.8%)
Unknown	3 (2.7%)
If interested → What type of treatment?* *(Select all that apply)*	**N=4**
Detox	1 (25.0%)
MAT	1 (25.0%)
Outpatient rehab	0 (0.0%)
Inpatient rehab	1 (25.0%)
One-on-one counseling	0 (0.0%)
Group counseling	0 (0.0%)
Peer recovery coaching	0 (0.0%)
Support group	0 (0.0%)
Other	0 (0.0%)
Unknown	1 (25.0%)
If not interested → Why not interested? *(Select all that apply)*	**N=77**
Does not have health insurance and cannot cover the cost	1 (1.3%)
Has health insurance but it doesn't cover the treatment or doesn't cover full cost	0 (0.0%)

Doesn't have transportation to a program/program too far away	2 (2.6%)
Inconvenient hours of operation	6 (7.8%)
Couldn't find a program that offered the type of treatment or counseling wanted	2 (2.6%)
Not ready to stop using	3 (3.9%)
No openings in the program	0 (0.0%)
Does not know where to go for treatment	2 (2.6%)
Concerned that neighbors/friends will have negative opinion	0 (0.0%)
Concerned that getting treatment might have negative effect on job	0 (0.0%)
Do not need it	63 (81.8%)
Unknown	0 (0.0%)
Refused	0 (0.0%)

**Question was added to interviews completed after 5.17.22*