



Utah Drug Monitoring Initiative

# Fentanyl Report

A joint publication of public health and public safety agencies in the State of Utah

June 2021

This report addresses DHS HSEC Codes: HSEC-5.9.6, HSEC 5.9.7, HSEC 6.2.1, HSEC 6.2.3 and SIAC Standing Information Requirements: UTSIAC-05-04

**Attention:** "Receipt of this information constitutes acceptance of all terms and conditions regarding its use, handling, storage, further dissemination or destruction. At a minimum, recipient acknowledges a commitment to comply with all applicable laws protecting privacy, civil rights, and civil liberties, in the collection, use, analysis, retention, destruction, sharing and disclosure of information." This report is UNCLASSIFIED and can be shared freely without restriction.

**Scope Note** - This joint report was completed based on information obtained from the Utah Department of Public Safety (DPS), Utah Department of Health, Utah Office of the Medical Examiner, Utah DPS Crime Laboratories, Utah Poison Control Center, and state and local law enforcement agencies. This assessment will focus on data obtained regarding the impact of illicit fentanyl use in Utah. Some data sets are not available to the current year, so the most recent data available will be represented. All data obtained from medical professionals did not include personally identifiable information and complies with all data sharing agreements. Data may also vary from year to year based on methods utilized to compile certain data sets. Data identified in this report supersedes all other reported DMI data.

SIAC-2021-134

## Table of Contents

<b>Executive Summary .....</b>	<b>2</b>
<b>Acknowledgements .....</b>	<b>4</b>
<b>Introduction .....</b>	<b>5</b>
What is Fentanyl? .....	5
Where does fentanyl come from?.....	5
Is Fentanyl a Problem in Utah?.....	6
Why should we care about fentanyl?.....	6
<b>Insights from Mortality and Seizure Data .....</b>	<b>8</b>
Drug Overdose Fatalities .....	8
Law Enforcement Supply Indicators .....	10
Forms of Fentanyl in Utah from Law Enforcement Submissions to the Utah State Crime Lab.....	12
Summary of the Situation in Utah based on Mortality and Law Enforcement Data.....	13
<b>What Are We Doing: Current Responses .....</b>	<b>14</b>
Harm Reduction Services.....	14
Fentanyl Test Strip Distribution Pilot Project .....	14
Public Health and Public Safety Partnerships.....	17
<b>Recommendations to Mitigate the Impact of Fentanyl .....</b>	<b>18</b>
Public awareness campaign.....	18
Modifications to Naloxone Distribution and Availability.....	19
Increase Access to Fentanyl Test Strips and Drug Testing Services.....	20
Training and Support to First Responders .....	21
Training and support to first responders is vital to increase understanding of the risks and safety in using PPE while interacting with potential fentanyl in the field and people who might have used fentanyl. ....	21
Increased Support for Public Health and Public Safety Surveillance Infrastructure .....	21
Broadening Overdose Prevention Programming to Focus on all Substances, Not Just Opioids .....	22
Continued Expansion of Substance Use Disorder Treatment Options for all Utahns .....	22
Grief and Loss Counseling and Support Groups .....	23
Staff and Equipment Available to the Office of the Medical Examiner .....	23
Nothing About Us Without Us .....	23
<b>References .....</b>	<b>24</b>

## Executive Summary

This report was created through The Utah Drug Monitoring Initiative (DMI), a multi-agency program focused on collaboration and information sharing between Utah law enforcement and public health agencies. The purpose of this report is to alert policymakers and other critical decision makers in the State of Utah to the urgent problem presented by fentanyl and other synthetic opioids in Utah. This report provides the most current information from DMI partners regarding the impacts of fentanyl in Utah and recommendations on actions that could be taken to mitigate its impact.

### **Public health and law enforcement data both show clear trend agreement and offer troubling insights as to where the situation will be in the coming months and years.**

Utah Department of Health mortality data shows that the number of deaths involving fentanyl more than doubled from 2019 to 2020 (125% increase) and that this trend has continued into 2021. Further highlighting this alarming trend, from January to March of 2021, the Utah Highway Patrol has reported more than a 900% increase in fentanyl seizures, compared to all of 2020.

The mortality data through 2020 demonstrates that fentanyl is killing Utahns at an alarming and sharply increasing rate. The law enforcement data demonstrates that the supply of fentanyl is sharply increasing and that it is commonly trafficked in the form of counterfeit pills and powder. Together, these two data sources show clear trend agreement and offer troubling insights as to where the situation will be in the coming months and years if these trends .

### **In 2020, approximately 60% of fentanyl samples submitted to the Utah State Crime Lab by law enforcement agencies were in the form of counterfeit pills or tablets.**

Fentanyl is increasingly being distributed as counterfeit, or “pressed” pills, which are often marketed as legitimate pharmaceutical drugs. Counterfeit pills are now nearly indistinguishable from authentic pharmaceutical pills or tablets. The lack of quality control in illegal pill pressing operations results in unpredictable dosing of fentanyl in the produced counterfeit pills and have led to numerous overdose deaths in Utah.

### **In June of 2020, fentanyl test strip distribution began through several Utah Syringe Services Programs, representing one of the only direct actions taken to specifically prevent fentanyl overdoses.**

The Utah Department of Health (UDOH) was funded by the Utah Division of Substance Abuse and Mental Health in May 2020 to purchase and distribute Fentanyl Test Strips (FTS) to participants of the Utah Syringe Services Programs (SSPs). Participants are given FTS and provided education on how to use them, interpret results, options for behavior changes based on results, and information on substance use disorder treatment options.

As of March 31st, 2021, 10,152 FTS have been distributed during 4,617 client encounters. Based on the preliminary results included in this report, using FTS leads to changes in drug use behavior that can help prevent fentanyl overdoses. With the approximate cost of each fentanyl test strip at one dollar, this represents a relatively low-cost intervention for preventing fentanyl overdoses and encouraging harm reduction behaviors in people who use drugs.

**Recommendation: Public awareness campaign**

Many, especially adolescents and “naïve” users are unaware of the risks associated with the drugs they are using. We have seen numerous instances of young people “experimenting” with what they believed to be oxycodone tablets. Unfortunately, many have been sold fentanyl tablets and have died. Therefore, there is a need for a greater public awareness campaign that educates on the existence of counterfeit pills and emphasizes the dangerous and unpredictable dosing of fentanyl in counterfeit pills with statements such as, “unless your pills come directly from a pharmacy, you don’t know what is in them”.

**Recommendation: Modifications to Naloxone Distribution and Availability**

With fentanyl becoming ever more prevalent in Utah, there is a need for greater access to naloxone nasal rescue kits, and higher doses of naloxone may be needed. Increased access to naloxone among members of the community and first responders is key for saving lives (Baldwin 2021).

Naloxone comes in many forms. However, the nasal form is preferable because it is more concentrated and is easier to administer than other forms. Because fentanyl binds more avidly to opioid receptors, it is crucial that higher concentrations of the medication be delivered to people overdosing with fentanyl. There is a need to expand access to this life saving medication through medical clinics, harm reduction groups and other concerned parties.

**Recommendation: Increase Access to Fentanyl Test Strips and Drug Testing Services**

Data from the fentanyl test strip pilot project in Utah and published research indicates that if drug users have a cheap and easy way to test their drugs to see they contain fentanyl, it leads to changes in drug use behavior that can help prevent fentanyl overdoses. Continued funding, and expanded distribution points, of FTS is a low cost method that can alter users’ behaviors in ways that mitigate risks and prevent overdose.

## Acknowledgements

This joint report was prepared by the following staff from public health and public safety agencies participating in the Utah Drug Monitoring Initiative:

Robert Simpson, MD, FASAM, Dipl. ABIM, ABPM-ADM, *(Medical Director, Utah Addiction Medicine; Medical Consultant, Utah Division of Substance Abuse and Mental Health; Medical Director, Utah Professionals' Health Program; Adjunct Faculty University of Utah, Dept. of Psychiatry)*

Michael Moss, MD, *(Medical Director, Utah Poison Control Center; Assistant Professor, Division of Emergency Medicine; Medical Toxicology Consult Service; Addiction Medicine Consult Service)*

Sydney Bowen, MPH, *Utah Department of Health, Syringe Service Program Evaluator*

Heather Bush, *(Utah Department of Health, HIV and STD Program, HIV Team Lead)*

Neiufi longi, MPA, *Division of Substance Abuse and Mental Health, Program Administrator*

VaRonica Little, LCSW, *Division of Substance Abuse and Mental Health, State Opioid Treatment Authority, Program Administrator*

Megan Broekemeier, MPH, *Office of the Medical Examiner Utah Department of Health, Fatal Drug Overdose Research Coordinator*

Meghan Balough, MPH, CHES, CPM, *Violence & Injury Prevention Program, Utah Department of Health, Overdose Epidemiologist/Evaluator*

Samuel Warren, *Utah Army National Guard, Criminal Intelligence Analyst*

Kelly Whittle, *Utah Department of Public Safety Bureau of Forensic Services, Forensic Scientist Manager*

Bill Newell, *(Utah Department of Public Safety; Rocky Mountain High Intensity Drug Trafficking Area, Overdose Response Strategy)*

Stephen Barnes, MPH, *(Utah Department of Health; CDC Foundation, Overdose Response Strategy)*



## Introduction

Utah, and the United States as a whole, is in the midst of an evolving series of overlapping and interrelated epidemics of pharmacologically similar substances—the opioid class of drugs. The first wave of the epidemic was prescription opioids, the second wave was heroin, and the third, ongoing wave, is synthetic opioids (e.g. fentanyl). The majority of overdoses currently are attributable to illicitly manufactured fentanyl.

### What is Fentanyl?

Fentanyl belongs to a family of medications known as opioids. Opioid medications are used to treat pain. Other opioids include hydrocodone and oxycodone, which are often used to medically manage pain after an injury or surgery.

Heroin is also an opioid, but it is not used for medical reasons in the US. In fact, heroin is one of the most commonly misused drugs from the illicit market. Heroin is stronger than most other opioids and is highly addicting. Fentanyl is about 50 times stronger than heroin, is more addicting and requires more frequent use than other misused opioid medications.

### Where does fentanyl come from?

Fentanyl is a synthetic opioid that is manufactured in laboratories. Currently, fentanyl primarily reaches the U.S. via Mexico. Trends indicate that in Mexico, fentanyl production is increasing. The dark web is another notable source of fentanyl. Users of the dark web are able to ship fentanyl powder and counterfeit tablets directly to individuals either for consumption or redistribution.

Interestingly, fentanyl is the only drug epidemic that is being driven primarily by supply-side dynamics rather than demand. Recent studies have demonstrated that most drug users do not seek fentanyl. Most drug users are unaware that they are consuming fentanyl (Mars 2019).

In general, fentanyl is distributed in two ways. First, fentanyl is added to heroin as a way of selling a stronger, more addictive product that is less expensive for the suppliers to manufacture and deliver. Second, fentanyl is distributed as counterfeit, or “pressed” pills, which are often marketed as legitimate pharmaceutical drugs. Counterfeit pills are now nearly indistinguishable from authentic pharmaceutical pills or tablets. Counterfeit pills are extremely hazardous and have led to numerous overdose deaths in Utah. The lack of quality control in illegal pill pressing operations results in unpredictable dosing of fentanyl in the produced counterfeit pills (Figure 1.).

### Poison Control Case Reports

The Utah Poison Control Center has received an increased number of reports of fentanyl overdose mostly related to counterfeit pills sold illegally in the community. The brief case-reports included throughout this report were provided by the Utah Poison Control Center to highlight how fentanyl is affecting Utahns and the significant danger posed by counterfeit pills.

Patients using prescription opioids recreationally should be aware that pills purchased in the community often look identical to genuine commercial products but are actually counterfeit and may contain fentanyl. These counterfeit pills may contain a very high amount of fentanyl that could lead to overdose and death, even in habitual users.

## Is Fentanyl a Problem in Utah?

Fentanyl has become a major problem in Utah as demonstrated in fatality and law enforcement data presented in this report.

Interestingly, many long-time consumers of drugs do not like fentanyl or the effect it is having on their community members. For instance, users of heroin do not like the feel of fentanyl as compared to that of heroin. Furthermore, although fentanyl is cheaper initially, its effects are shorter in duration, causing the user to have to repeat use more frequently. In addition, the development of tolerance (i.e. dose needed to feel an effect) occurs much more rapidly than with other opioids.

A lethal dose of fentanyl is estimated to be about two milligrams but can vary based on a number of factors, such as body size and tolerance from previous use. Measuring such small amounts requires laboratory conditions and special equipment that counterfeiting organizations likely do not use. According to a 2019 report from the Drug Enforcement Administration (DEA) Fentanyl Signature Profiling Program, one out of every four counterfeit tablets contained a potential lethal dose of fentanyl (Fentanyl Signature Profiling Program Report, 2019).

Additionally, other drugs such as cocaine, methamphetamine, and benzodiazepines are also being mixed or laced with fentanyl. Consumers of laced substances may be unaware that they are ingesting fentanyl. This is dangerous because people with less tolerance for opioids are at extremely high risk for accidental overdose.

## Why should we care about fentanyl?

From 2014 to 2018, fentanyl rapidly spread throughout the northeast and mid-Atlantic regions of the U.S. while western states saw a much less dramatic spread. This may be because of the predominance in western states of black tar heroin, which produces a high that is more distinct from fentanyl and is a thicker substance that may be more difficult to mix with fentanyl powder. However, a recent report released by the Centers for Disease Control and Prevention (CDC) in February 2021 highlights that the West census region experienced the largest relative (68%) and absolute (1.9 per 100 000) increase in deaths involving fentanyl (Mattson 2021). Meanwhile, nine states in the East census region reported that more than 70% of all their overdose deaths involved synthetic opioids in 2019 (Mattson 2021).

States in the eastern U.S. that have been contending with fentanyl for years may offer important insights about what the fentanyl situation in Utah may look like over the next several years. Unfortunately, data from these communities indicate that once fentanyl emerges in a community, its prevalence only increases as do

**Figure 1. Infographic on counterfeit tableting process and unpredictable dosing of fentanyl**



## Next-of-Kin Interviews

The Utah Office of the Medical Examiner completes interviews with family members who have lost someone to a fatal drug overdose. The purpose of next-of-kin interviews is to better understand the circumstances that lead to a fatal drug overdose. This information is used to inform drug overdose prevention efforts in Utah. The brief case reports included throughout this report demonstrate the consequences of unknowingly ingesting fentanyl.

the overdoses related to increases in use. In addition to the enormous and tragic loss of human life associated with this drug, there is a commensurate escalation in the fiscal costs that impacts the community.

As of writing this report in 2021, fentanyl is now widely available and overdose rates are dramatically increasing in Utah. The problems associated with opioid use disorder and overdose deaths have yet to be fully addressed by any state in the U.S. Even with prompt, targeted responses, many of the problems associated with opioid use disorder will persist for decades to come. This report offers a unique and broad perspective of the way Utah understands and responds to this urgent problem.



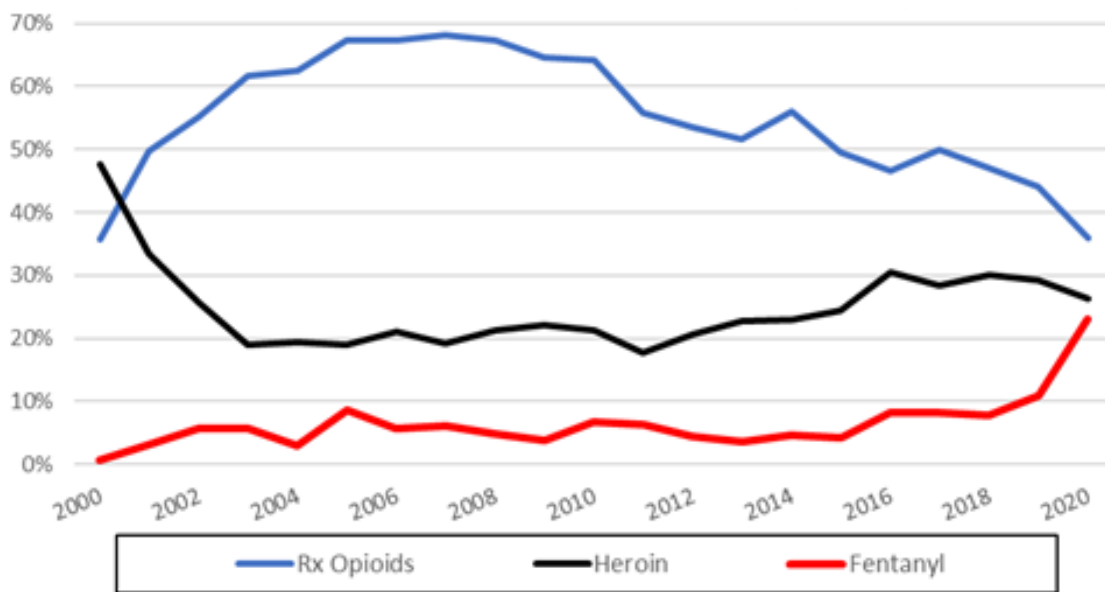
## Insights from Mortality and Seizure Data

To understand the shifting landscape brought on by fentanyl, this section examines Utah trends in both mortality data and supply indicators from law enforcement. Both types of data have limitations; however, the two data sources' limitations are largely unrelated, so when both signal similar temporal trends in the same places, they likely reflect true underlying trends. In this section we find considerable overlap in temporal and spatial trends for fentanyl overdoses and law enforcement supply indicators.

### Drug Overdose Fatalities

The number of deaths involving fentanyl more than doubled from 2019 (54) to 2020 (122; 125% increase). In 2019, 11% of overdose deaths of accidental or undetermined intent involved fentanyl compared to 23% in 2020 (Figure 2).

**Figure 2. Percentage of All Drug Involved Deaths in Utah by Drug Type**

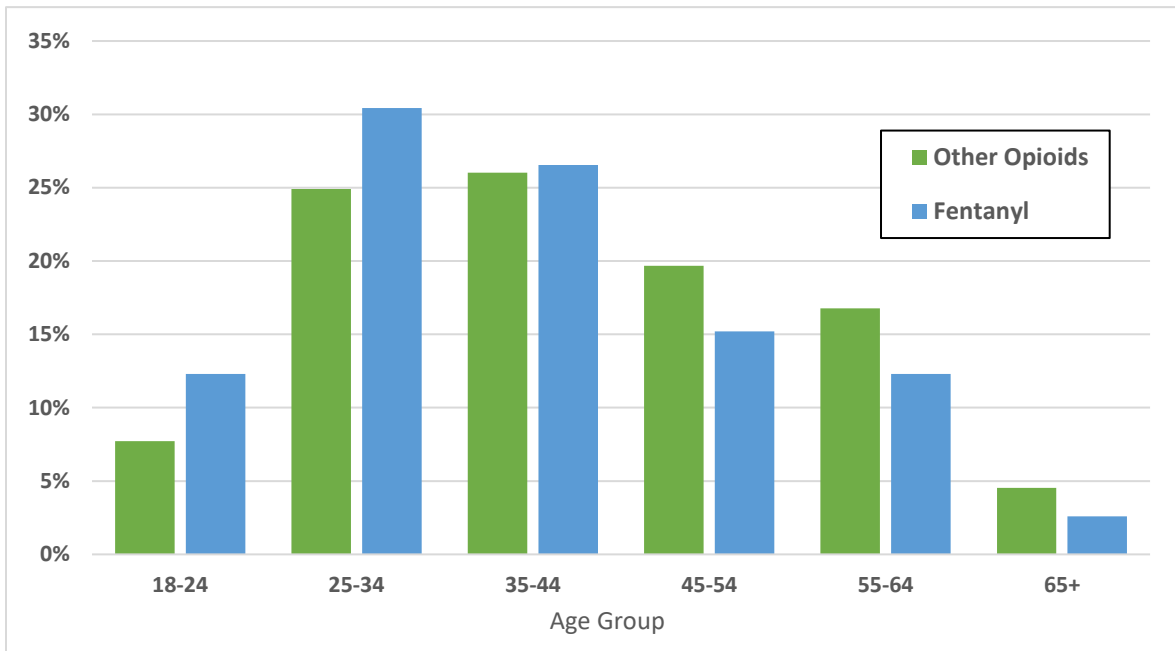


Source: preliminary data from the Utah Office of the Medical Examiner Examiner

The highest percentage of decedents (33%) who died by fentanyl overdose in 2020 were aged 25-34, over half were male (66%) and most were white (92%) and non-Hispanic (82%). In comparison to those who died by prescription opioids and heroin, decedents who died by fentanyl overdose in 2020 were younger (mean age 38 vs. 42), more likely to be male (66% vs. 58% male) and Hispanic (17% vs. 10%).

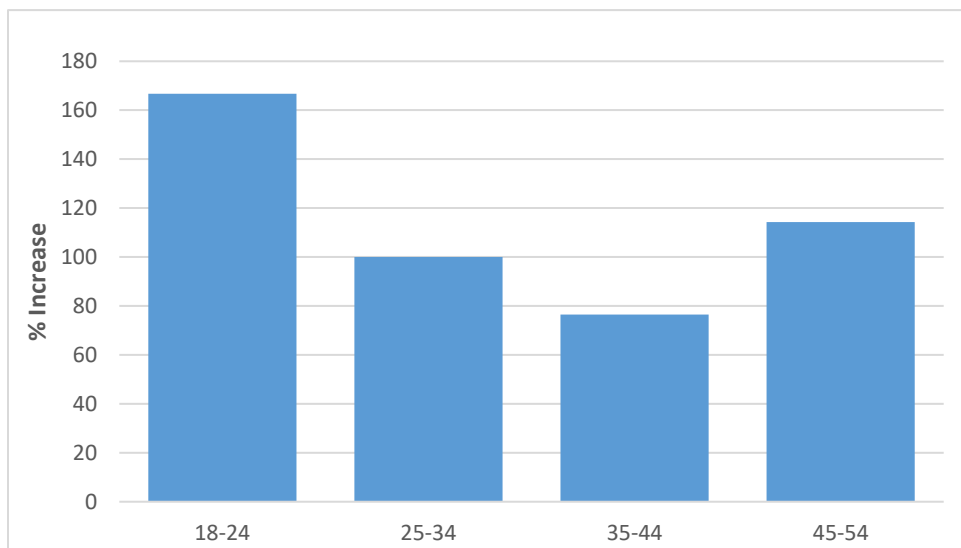
Historically, the highest percent of opioid related fatalities were found in the 35-44 age group; for fentanyl related fatalities, the 25-34 age group has the highest percent of fatalities (Figure 3).

**Figure 3. Fentanyl vs. Other Opioid Deaths in Utah, Proportions by Age Group, 2016-2020**

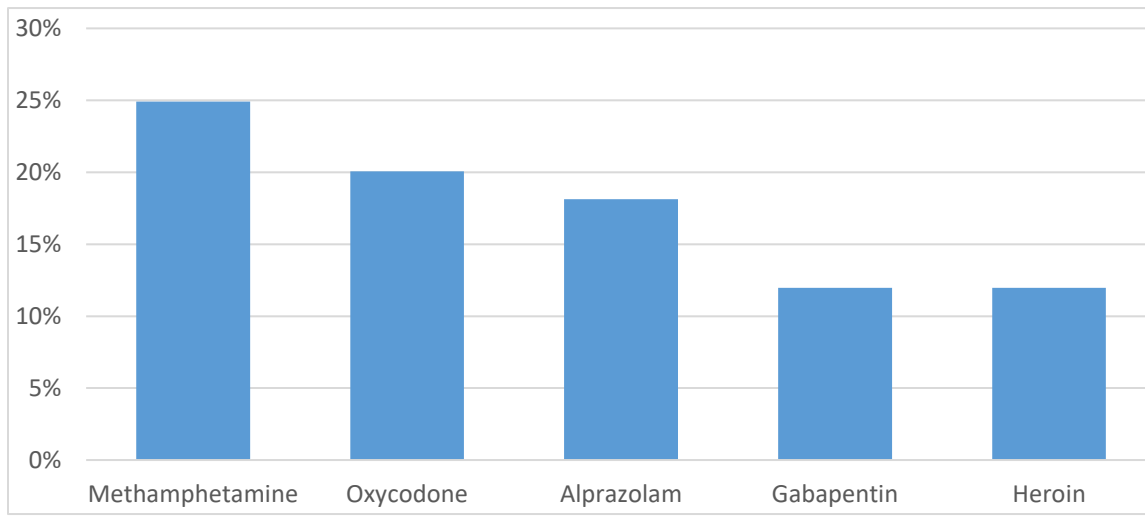


In 2020, Fentanyl deaths increased across all age groups compared to 2019 (Figure 4), the largest percentage increase was among the 18-24 year age group (166% increase) followed by 25-34 (100% increase).

**Figure 4. Percent Increase in Fentanyl Related Deaths in Utah from 2019 to 2020, by Age Group**



From 2016-2020, 84% of fentanyl related deaths involved more than one drug. From 2016-2020, methamphetamine was the most common drug involved in fentanyl related deaths followed by oxycodone (Figure 5). Unlike states in the eastern U.S., few fentanyl deaths in Utah also involve heroin or cocaine. From 2016-2020, 12% and 9% of fentanyl deaths involved heroin and cocaine, respectively.

**Figure 5. Common Drug Types among Fentanyl Deaths in Utah, 2016-2020**

A noteworthy trend observed in 2020 was a large increase (525%) when compared to 2019 in the number of deaths where fentanyl was the only drug involved. While it is difficult to determine due to gaps in available data, the increase in the deaths involving only fentanyl, and among younger age groups, could be related to the increasing availability of counterfeit prescription medications that contain fentanyl.

### Next-of-Kin Interview

An adult female misused prescription medication throughout her life. Her drug of choice was oxycodone. She obtained oxycodone regularly by stealing from family members, friends and through an illicit source. When asked if the informant believed the decedent knowingly ingested fentanyl on the day of her death, she answered, "Most definitely not. I'm sure she thought she was only taking oxycodone." She died as a result of a polysubstance drug overdose. Oxycodone was not detected in forensic toxicology testing.

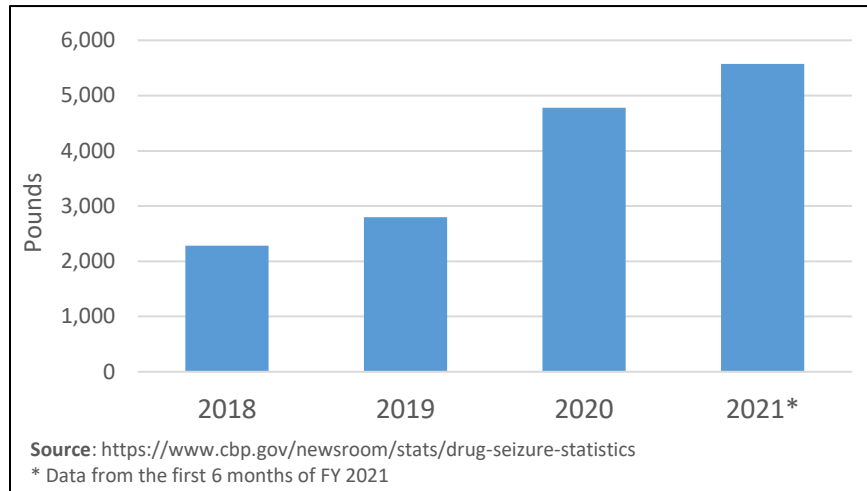
A 2020 study found that peak Prescription Drug Misuse (PDM) is in the 17 to 20-year age range (Schepis 2020). In general, PDM prevalence rates increase from adolescence to young adulthood, where rates peak; rates decrease slightly in the 26 to 34-year-old age range, then drop through the rest of the lifespan. Additionally, the same study showed that PDM with recreational motives tends to peak in young adulthood as does greater use of peer sources to obtain medication for PDM.

In summary, this analysis of overdose mortality data through 2020 shows that Utah markets are increasingly transitioning toward fentanyl synthetic opioids and away from traditional illicit opioids, such as heroin and diverted prescription pain relievers.

### Law Enforcement Supply Indicators

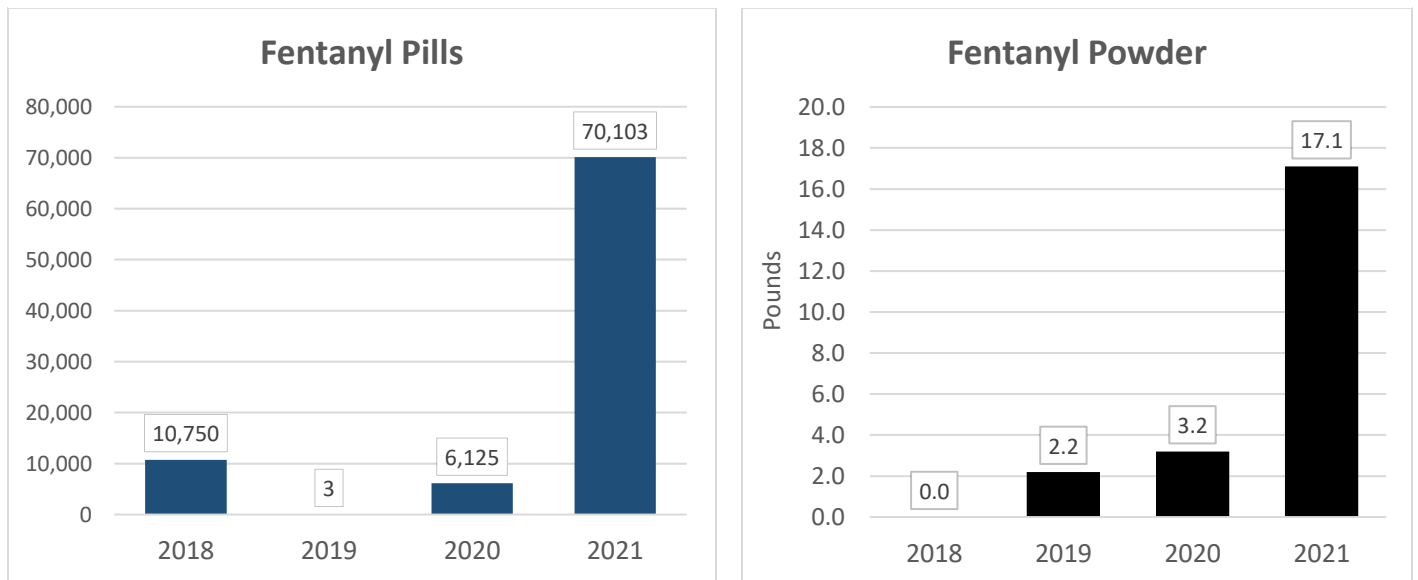
According to the U.S. Customs and Border Protection (CBP), seizures of fentanyl began increasing significantly in June 2020 and have remained high, with significant spikes in October and December 2020. First quarter seizures for 2021 are well above the previous three-year average for the same timeframe (U.S. Customs & Border Protection 2021).

**Figure 6. Pounds of Fentanyl Seized by U.S. Customs and Border Patrol, FY Comparison**



Further highlighting this alarming trend, from January to March of 2021, the Utah Highway Patrol has reported more than a 900% increase in fentanyl seizures, including counterfeit pills, compared to all of 2020.

**Figure 7. Fentanyl Seizures by Utah Law Enforcement, 2018-2021**



## Forms of Fentanyl in Utah from Law Enforcement Submissions to the Utah State Crime Lab

In 2020, approximately 60% of fentanyl samples submitted to the Utah State Crime Lab by law enforcement agencies were in the form of counterfeit pills or tablets. Most commonly, the counterfeit pills appear to be pharmaceutically manufactured 30-milligram oxycodone tablets. Of great concern is that those misusing diverted prescription pain medications could be at substantial risk of overdose, because they may incorrectly assume that these counterfeits are of genuine origin.

Careful identification of specific forms of fentanyl is key to understanding the spread into U.S. markets and to mitigating risks associated with drugs of varying potency. Currently, in Utah one of the only sources of this type of data is through law enforcement submissions to the Utah Department of Public Safety Bureau of Forensic Services State Crime Lab.

A 2019 study established a statistically significant association between law enforcement drug seizures and overdose deaths in Ohio from 2014 to 2017, thus establishing law enforcement/crime lab data as a potential early indicator of emerging opioid overdose deaths (Zibbell 2019). This finding underscores the need to maintain or expand data-sharing partnerships between Utah public health and public safety organizations to address the fentanyl crisis with more detailed and timely drug testing data.

### Poison Control Case Report

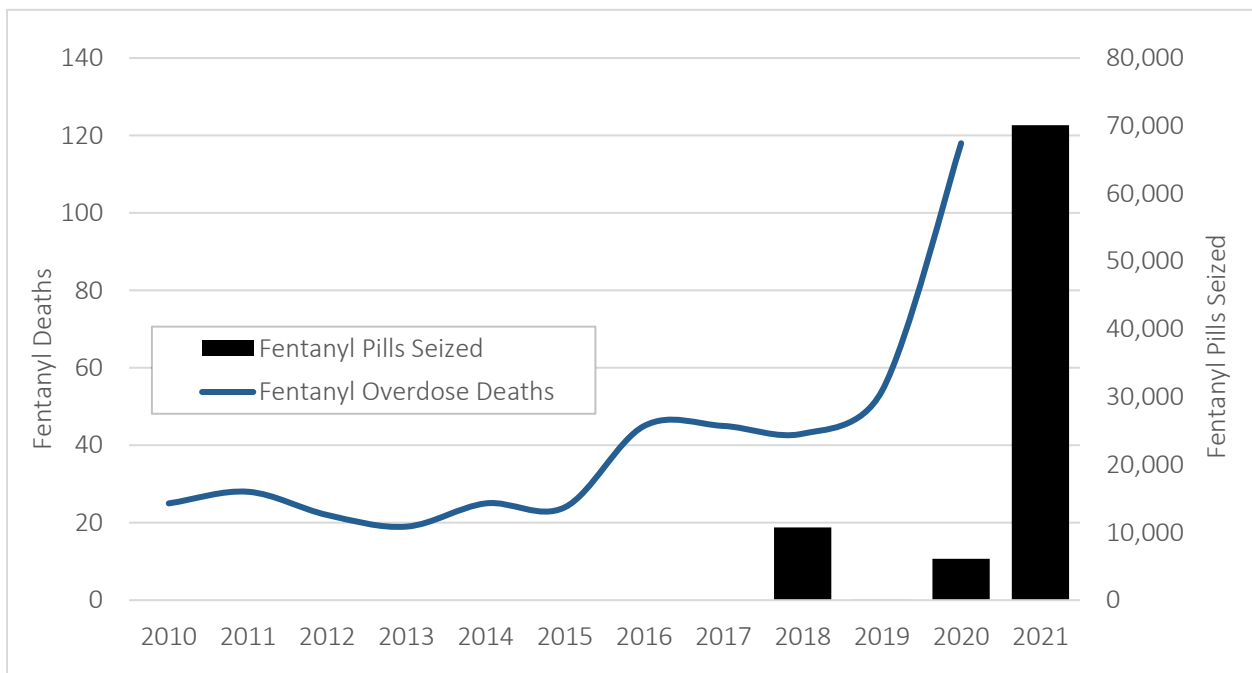
In April of 2020, an adult female ingested a single tablet she believed was an oxycodone 30 mg tablet. She habitually purchased these on the street and used them recreationally. However, on this occasion, she suffered a respiratory arrest after ingesting the tablet and was taken to a local emergency department. Thankfully, she responded completely to naloxone and was revived. After ingestion, she suspected the tablet might contain fentanyl as she did not expect such a severe effect from taking 30 mg of oxycodone. Subsequent testing of her blood and urine detected fentanyl. No oxycodone was detected.

## Summary of the Situation in Utah based on Mortality and Law Enforcement Data

The mortality data through 2020 demonstrates that fentanyl is killing Utahns at an alarming and sharply increasing rate. The law enforcement data demonstrates that the supply of fentanyl is sharply increasing and that it is often trafficked in the form of counterfeit pills and powder. Together, these two data sources show clear trend agreement and offer troubling insights as to where the situation will be in the coming months and years.

Data from the hardest hit states in the Mid-Atlantic and New England area demonstrate what is intuitively obvious with the Utah specific data presented here; there is generally a positive correlation between states' rates of fentanyl seizures and counts of fentanyl deaths. States exposed to the fentanyl wave much earlier than Utah yield insights on the impending public health and safety crisis that Utah will likely be confronting in the very near future. While 2021 fentanyl overdose death data is currently unavailable, law enforcement seizure data is already up over 900% in the first 3 months of 2021 alone (Figure 8).

**Figure 8. Fentanyl Mortality and Law Enforcement Seizure Data in Utah**



## What Are We Doing: Current Responses

### Harm Reduction Services

In May 2016, syringe exchange became legal in the state of Utah. In 2020 Utah Syringe Services Programs (SSPs) enrolled 1,829 new clients, and served 3,249 unique individuals at 18,468 encounters. Syringe services are available in seven counties: Carbon, Davis, Emery, Salt Lake, Tooele, Utah and Weber.

Sometimes called a “needle exchange” or “syringe exchange,” SSPs are community-based prevention programs that provide a range of services for the prevention and reversal of opioid overdose, such as naloxone distribution and training, fentanyl testing strips and linkage to substance use disorder treatment. SSPs are vital in protecting the public and first responders by facilitating the safe disposal of used syringes and preventing outbreak of infectious diseases. In June of 2020, fentanyl test strip distribution began through several Utah SSPs, representing one of the only direct actions taken to specifically prevent fentanyl overdoses.

These factors highlight the critical role that SSPs play in overdose prevention efforts, especially as states respond to the urgent problems posed by fentanyl’s increased prevalence in drug markets across the US.

### Fentanyl Test Strip Distribution Pilot Project

The Utah Department of Health (UDOH) was funded by the Division of Substance Abuse and Mental Health in May 2020 to purchase and distribute Fentanyl Test Strips (FTS) to participants of the Utah Syringe Exchange

#### Next-of-Kin Interview

A middle aged female Utahn used illicit drugs as a way to self-medicate depression and anxiety. The decedent’s drug of choice was methamphetamine, and she reportedly smoked daily. The decedent was described as an experienced drug user who would not use fentanyl knowingly. On the day of her death, she obtained methamphetamine from an unknown source and later died by a methamphetamine and fentanyl-involved overdose.

Program. Fentanyl test strips were distributed through SSPs, beginning June 1, 2020. Four SSPs chose to participate in the pilot project: Utah Harm Reduction Coalition, One Voice Recovery, Soap 2 Hope, and the Southeast Utah Health Department. The pilot program expanded to allow other Community-Based Organizations (CBOs) to distribute FTS to their clients in August 2020. The two other CBOs that chose to participate were: Utah Support Advocates for Recovery Awareness (USARA) and The Road Home. All participating agencies were provided training, educational materials, FTS, and referral information. All participating agencies agreed to the UDOH guidelines of FTS distribution and were asked to collect self-reported data from individuals after they received the FTS. SSPs and CBOs submitted participant responses by paper or electronic form.

The FTS detect the presence of fentanyl and several of the most common fentanyl analogs. Participants are given FTS and provided education on how to use them, interpret results, and options for behavior changes they can make based on results.

Participants are also given information on additional overdose prevention methods and substance use disorder treatment options.

Although it is difficult to estimate the lives that may have been saved by the use of these test strips, we do know that the distribution of FTS, the overdose prevention education provided, and the additional tools utilized by the drug using community have created an opportunity for increased awareness and empowerment. Data included in this report represents participant responses from June 1, 2020 - April 30, 2021. Data includes responses from SSP participants, as well as clients from other CBOs.

Between June 1, 2020 and April 30, 2021, SSPs and CBOs distributed 10,834 FTS during 4,887 client encounters. In the duration of the project, 743 clients who received FTS provided survey responses. Of those 743 responses, 513 reported using the FTS (Table 1).

Table 1. Fentanyl Test Strip Use

Did you use the Fentanyl Test Strip?	
	N (%)
Yes	513(69.04%)
No	230(30.96%)

Participants were asked to report the results of the FTS. Clients may have been more likely to report positive results, compared to negative results or strips that were difficult to interpret due to user error (Table 2). User error may also contribute to the large proportion of positive test results. For most people who use drugs in Utah, this is a new harm reduction tool.

Table 2. Fentanyl Test Strip Results

What were the test strip results?	
	N (%)
Positive	298(63.0%)
Negative	171(36.2%)
Did not work	2(0.4%)
Could not tell if it worked	2(0.4%)

Participants were asked to provide the type of drug that was tested. If a participant was using a mix of drugs, they were asked to report all the drugs being used that were tested with a single fentanyl test strip. If an FTS used to test both methamphetamine and heroin had a positive strip result, it would not be possible to discern which of the drugs mixed contained fentanyl.

Methamphetamines and heroin were the most commonly reported drugs (Table 3).



Table 3. Drugs Tested with Fentanyl Test Strips

What drug(s) was tested? (If a mixed drug, check all)	
	N (%)
Heroin	404(78.75%)
Meth/Speed	126(24.56%)
Fentanyl	9(1.75%)
Crack/Cocaine	4(0.78%)
Prescription Pain Medicine	2(0.39%)
Benzodiazepines	2(0.39%)
Gabapentin	1(0.19%)

Participants were asked to select or describe what harm reduction behaviors, if any, they used based on the results of the FTS. The most common harm reduction behavior reported was having naloxone available (Table 4).

Table 4. Harm Reduction Behaviors

Based on test strip results, what did you do differently?	
	N (%)
Had naloxone available	124(44.60%)
Used with someone else around	97(34.89%)
Used the same as if I hadn't used the test strip	67(24.10%)
Went slow	58(20.86%)
Shared results with others using the drug	45(16.19%)
Used less	38(13.67%)
Did a test shot/hit	31(11.15%)
Let seller know results	20(7.19%)
Disposed/threw them out	12(4.32%)
Gave them away	6(2.16%)
Smoked instead of injecting	4(1.44%)
Other	4(1.44%)
Sought drug treatment or counseling	3(1.08%)
Sold them	1(0.36%)
Snorted instead of injected	0
Declined to answer	235

In summary, based on the preliminary results included in this report, and previously published research, using FTS and receiving a positive test result for fentanyl leads to changes in drug use behavior that helps prevent fentanyl overdoses. The distribution of FTS represents a much needed addition to current overdose prevention. With the approximate cost of each fentanyl test strip at one dollar, this represents a relatively low-cost intervention for preventing fentanyl overdoses and encouraging harm reduction behaviors in people who use drugs.

## Public Health and Public Safety Partnerships

Connecting clinical, public health, public safety, and other community partners to share data, and monitor trends enables better coordinated, and time-sensitive response activities to the unique issues facing Utah communities (Baldwin 2021). Models like this already exist, such as the Utah Drug Monitoring Initiative (DMI). DMI partners collaborate to increase understanding of the local overdose crisis, optimize jurisdictional capacity, and establish shared accountability for continuous improvement. Other efforts capitalize on unique opportunities to link persons to treatment from public safety venues, such as pre-arrest diversion programs in Davis County.

These partnerships are essential to address the Utah overdose epidemic and are supported in part by the CDC's Overdose Data to Action (OD2A) program. Additionally, these partnerships, such as those within the Utah DMI, are supported through the Overdose Response Strategy (ORS), an initiative where the CDC collaborates with 21 High Intensity Drug Trafficking Areas (HIDTA) to coordinate data sharing and develop and support the implementation of evidence-based programs and collaborations between public health and public safety.

### Poison Control Case Report

In August of 2020, an adolescent male ingested several "M-30" tablets believed to be oxycodone 30 mg tablets. He was taken to the hospital and successfully treated with naloxone. Testing performed by the Utah Public Health Laboratory detected fentanyl in his blood and urine but no oxycodone.

## Recommendations to Mitigate the Impact of Fentanyl

### Public awareness campaign

It is, of course, important to continue criminal justice efforts to pursue, seize and monitor fentanyl in our communities. However, this alone will not be enough to reduce the number of people who die from fentanyl overdose.

Many, especially adolescents and “naïve” users are unaware of the risks associated with the drugs they are using. We have seen numerous instances of young people experimenting with what they believed to be oxycodone tablets. Unfortunately, many have been sold fentanyl tablets and have died. Therefore, there is a need for a greater public awareness campaign that educates on the existence of counterfeit pills and emphasizes the dangerous and unpredictable dosing of fentanyl in counterfeit pills with statements such as, “unless your pills come directly from a pharmacy, you don’t know what is in them”.

Most commonly, the counterfeit pills look like pharmaceutically manufactured 30-milligram oxycodone tablets and contain fentanyl—not oxycodone hydrochloride—as their sole active ingredient. They are circular in shape, light blue to light green in color, and have an “M” inside a square stamped on one side and a “30” stamped on the other side (Figure 9).

**Figure 9. Counterfeit Pill Markings/Impressions**



As an example, King County, WA has set up a website that provides information on fentanyl and resources to prevent overdose (e.g. <https://www.lacedandlethal.com>). This website encourages the substance using community to band together in order to protect themselves and each other from overdose and the unscrupulous lacing of heroin and other drugs with fentanyl.

There is indignation among many users that their drugs are being laced recklessly with a substance that is far more dangerous than the drug that they typically use. This energy can be harnessed as a part of the anti-fentanyl PR campaign. Dealers who can demonstrate that they have drugs not contaminated with fentanyl (using test strips) will gain greater market share than those who are unwilling to obtain fentanyl free heroin.

Finally, harm reductionists, such as providers of syringe exchange services, are uniquely poised to implement strategies that impact fentanyl overdose rates. Harm reductionists have rapport with the community, they can educate, provide naloxone, distribute fentanyl test strips, and amplify messaging of the public awareness campaign. Messaging for public awareness may include use of the following harm reduction techniques:

- “Don’t use alone”
- “Use fentanyl test strips for ALL substances”
- “Try small doses first”
- “Make sure you have naloxone”
- “Know who else has naloxone close to you”
- “If you didn’t pick your pills up at a pharmacy, you don’t know what’s in them.”

Harm reduction can also provide access to treatment. It has been demonstrated that people who participate in medication assisted treatment using methadone, or buprenorphine, even inconsistently, have reduced likelihood of fatal overdose.

## Modifications to Naloxone Distribution and Availability

With fentanyl becoming ever more prevalent in Utah, there is a need for greater access to naloxone nasal rescue kits, and higher doses of naloxone may be needed. Increased access to naloxone among members of the community and first responders is key for saving lives (Baldwin 2021).

Naloxone can be dispensed by pharmacies without a prescription. Unfortunately, stigma has impacted individual requests for this medication, and in some cases, pharmacies' willingness to dispense it. Therefore, there is a need to expand access to this life saving medication through medical clinics, harm reduction groups and other concerned parties (Baldwin 2021, Coffin 2007).

Naloxone comes in many forms. However, the nasal form is preferable because it is more concentrated and is easier to administer than other forms. Because fentanyl binds more avidly to opioid receptors, it is crucial that higher concentrations of the medication be delivered to people overdosing with fentanyl.

The average time for a person to die from a heroin overdose is 20-30 minutes after ingestion. For fentanyl, that time is roughly 2 minutes (Drake 2016, Green 2016). A person experiencing an overdose has little, if any, ability to administer naloxone to themselves, whereas if another person is present, naloxone can be administered. Therefore, this public awareness campaign needs to be accompanied by messaging, “don’t use alone, or at the same time”.

The people who most often witness and respond to an overdose are other persons who use drugs. By equipping these individuals with naloxone and training them to identify and respond to an overdose, the potential delay between the onset of an opioid overdose and the delivery of life-saving care can be reduced from hours to seconds. This is especially true in rural areas, where residents may experience longer EMS response times. For this reason, the World Health Organization recommends community-based distribution of naloxone—putting the medicine in the hands of people who use drugs and their social networks—as the first line of defense against overdose (World Health Organization 2014).

There are an increasing number of grassroots movements where members of the using community are themselves providers of naloxone rescue. Providers of naloxone rescue are known in their communities and more likely to be called and able to reach an overdosing person before they die. Technology, such as mobile phone apps, may also increase the availability of naloxone to the using community (Lurie 2016). Recent examples include Trek Medics mobile phone-based apps that utilize decentralized emergency dispatching so that anyone carrying a mobile phone and Naloxone can be alerted when an overdose happens nearby.

It is essential that emergency services are called whenever an overdose occurs. Many people are unaware that there are Good Samaritan laws in effect that allow them to call 911 for an overdose with personal impunity.

Much of the impact on overdose prevention in general, and fentanyl overdose specifically, can come from expanding the role of harm reduction agencies in this area. Emphasis on expanding access to, or providing nasal naloxone kits can occur in this environment. Emphasizing “don’t use alone, or at the same time”. Provision of fentanyl test strips can also be increased.

The changing drug market in Utah highlights naloxone's crucial role in the state's overdose response. The coordinated Utah response must remain nimble and able to adapt to an ever-changing illicit drug market in order to have a meaningful impact on overdose rates. Innovative strategies should continuously be explored and expanded rapidly to optimize the potential benefits of these life-saving interventions.

In summary, Targeted naloxone distribution programs work best when:

1. Naloxone is provided to people at high risk of experiencing or witnessing overdose.
2. Outreach workers, harm reduction staff, and trusted clinicians are properly educated and comfortable distributing naloxone to those using illicit opioids or receiving a high-risk opioid prescription.
3. People who use drugs and first responders are well informed as to the potential effects and actions of naloxone. Comfort with carrying and administering naloxone is crucial.

## Increase Access to Fentanyl Test Strips and Drug Testing Services

Data from the fentanyl test strip pilot project in Utah and available published research indicates that if users have a cheap and easy way to test their drugs to see if those drugs contain fentanyl, then they might discard contaminated bags, or at least use them more cautiously. (Sherman et al., 2019). Continued funding, and expanded distribution points, of fentanyl test strips is a low cost method that can alter users’ behaviors in ways that mitigate risks and prevent overdose (Krieger et al., 2018; Peiper et al., 2019).

While fentanyl test strips are certainly a useful tool in this fight, they will become increasingly less useful as fentanyl becomes more prevalent, resulting in positive tests in most drug samples. Therefore, we are currently in the critical period of time where fentanyl-testing is most valuable in helping to potentially save a life.

As the drug market becomes penetrated with fentanyl, the relevant question becomes *how much* fentanyl a drug sample contains, not whether or not it contains fentanyl. Unfortunately, this is not a question fentanyl test strips can answer. Therefore, more advanced drug testing services will be needed to provide valuable

information on the concentration of fentanyl in a sample. Offering advanced drug testing services, via syringe exchange providers, would not only provide users with better information regarding their drug samples, they would also serve as public health and public safety surveillance tools by providing real-time information about what is available in local drug markets.

## Training and Support to First Responders

Training and support to first responders is vital to increase understanding of the risks and safety in using PPE while interacting with potential fentanyl in the field and people who might have used fentanyl.

The increased prevalence of fentanyl and other synthetic opioids in the illicit drug market means that first responders need to understand how to protect themselves from exposure in the field. It is critical that law enforcement and fire/EMS personnel have the appropriate resources and training to protect themselves when the presence of fentanyl is suspected, when exposure occurs, and when individuals exhibit signs of potential opioid exposure.

## Increased Support for Public Health and Public Safety Surveillance Infrastructure

### Next-of-Kin Interview

A young adult male Utahn was given what he believed was an oxycodone pill by an acquaintance. Oxycodone was his drug of choice, and he illicitly obtained oxycodone from friends, acquaintances and drug dealers regularly. He was also known to “doctor shop.” He died by a fentanyl-involved overdose after ingesting the pill. Oxycodone was not detected in forensic toxicology testing.

An important part of determining which programs are working in a given jurisdiction is collecting sufficient data. Jurisdictions should consider using opioid settlement funds to build the capacity of their public health department to collect data and evaluate policies, programs, and strategies designed to address substance use.

Another critical component in the fight against fentanyl and drug overdoses is forensic lab services available to the public safety and law enforcement workforce. It is critical to ensure that these services are easily accessible, and utilized, by law enforcement. Drug testing data from controlled purchases, seizures, and death scene investigations, are not only essential to law enforcement, they are a valuable data source for public health as well. Forensic lab data from law enforcement submissions enables timely public health alerts in scenarios where there is a sudden change, or contaminant, in the local

drug supply.

One surveillance strategy that could save lives, detect trends earlier, and influence product safety in illicit drug markets is provision of community drug testing services (Caudevilla 2016). Testing street drugs at the community level (e.g. onsite at syringe services programs) with the same rigor and qualitative instrumentation as state crime labs, can provide similar data to law enforcement seizures, but more quickly and closer to real time. This data could then be used to inform a community-based, early warning system that can help identify drug market changes and strengthen the pinpointing of geographic areas vulnerable to escalating overdose

outbreaks. This strategy has been used in many European countries, where it facilitates more robust and timely consumer, public health, and law enforcement understanding of black market products while providing low barrier access to harm reduction and other services (Brunt 2016).

New surveillance approaches and rapid expansion of evidence based interventions are critically needed to shift the curve of the epidemic of opioid use.

## Broadening Overdose Prevention Programming to Focus on all Substances, Not Just Opioids

Many of the overdose prevention programs discussed in this report target people who use opioids and people who are likely to witness an opioid overdose. However, surveillance data and review of individual fatal overdose cases has identified unintentional fentanyl exposure in the opioid naïve as a growing problem of the fentanyl era (Arena 2016, Klar 2016, Tobias 2021). Individuals purchasing pills illicitly may not be expecting an opioid, familiar with the effects of opioids, aware of naloxone programming, or knowledgeable about how to respond to an opioid overdose. Therefore, opioid specific overdose prevention programs and the community of people who use drugs may benefit from a broadening of overdose prevention programs and interventions to focus on all substances, not just opioids (Reed 2021).

### Poison Control Case Report

In November of 2020, another adolescent male ingested a single tablet he purchased on the street which he believed was an oxycodone 10 mg tablet. He suffered a respiratory arrest but was revived with naloxone and admitted to the ICU, and subsequently made a good recovery. His urine was negative for oxycodone but positive for fentanyl.

## Continued Expansion of Substance Use Disorder Treatment Options for all Utahns

A focus on expanding newly relaxed treatment practices is critical for the short and long term response to the opioid epidemic. As a response to COVID-19, the federal government has temporarily relaxed rules on opioid treatments in ways that were not possible before. In March 2020, the Substance Abuse and Mental Health Services Administration (SAMHSA) released guidance on opioid treatment programs, which permit states to request blanket exceptions for patients to receive 14 to 28 days of take-home doses of OUD medication, including methadone (SAMHSA 2020). Methadone clinics are now able to provide four weeks' worth of methadone, rather than requiring individuals to come in for daily visits and dispensing, and physicians are able to evaluate patients via telemedicine. Policymakers should make it a priority to implement these welcome enhancements in all jurisdictions, and to make them permanent to further alleviate the barriers to medication-assisted treatment (MAT) access, including expanding prescribing clearances to meet individuals' health needs.

Additionally, a major milestone was achieved in April 2021: physicians (including nurse practitioners and physician assistants) are now exempt from the "X"-waiver requirements that were previously needed to prescribe buprenorphine, an effective treatment for those with OUD. This decades old requirement was a significant barrier to accessing treatment. Effective April 28, 2021, this new policy brings the potential to

greatly increase access to MAT, particularly in rural areas. Focus in other areas that can benefit from this new policy are rural health centers, hospitals, prisons and jails.

## Grief and Loss Counseling and Support Groups

Grief associated with an overdose can be full of pain, uncertainty, guilt and shame. Furthermore, families bereaved by drug-overdose death may face social stigma, personal doubts and frequently feel that they lack support from family, friends and the community. Receiving low social support after experiencing a loss, especially when the death is sudden or unexpected is a risk factor for developing Prolonged Grief Disorder (PGD) (Burke & Neimeyer, 2013). PGD can be described as intense grief that persists over time and is significantly disruptive to a person's life (Smith, Kalus, Russel & Skinner, 2009). It has been shown that people who suffer from PGD have increased risk for adverse health effects, such as substance abuse, suicidal thinking, sleep disturbances and impaired immune function (Shear, 2010). Because of this, it is imperative for drug overdose loss survivors to find and access adequate grief resources and support. Bereavement groups in particular may be well suited to help avoid social isolation (Vlasto, 2010).

## Staff and Equipment Available to the Office of the Medical Examiner

Toxicology data from the Utah Office of the Medical Examiner (OME) plays a critical role in understanding drug threats posed to Utah communities. More accurate and timely information about the drug supply is a critical component of Utah's response to the overdose epidemic, which is currently stressed across both public health and law enforcement partners. Currently, the state of testing in Utah is not timely enough to allow for the full utility of these data to be realized and acted upon. Additional laboratory equipment and staffing at the OME would allow for rapid toxicology screening of decedents' blood samples and ultimately strengthen Utah's drug monitoring and overdose surveillance system.

## Nothing About Us Without Us

The saying "nothing about us without us" reflects the idea that public policies should not be written or put into place without the direction and input from the people who will be affected by that policy. This mantra has been used by persons living with disabilities as they fought for recognition as independent persons who know their needs better than anyone else.

In the context of today's opioid overdose epidemic, "nothing about us without us" speaks to the fact that prevention strategies need to take into account the realities, experiences, and perspectives of those at risk of overdose. Those affected by opioid use and overdose risk should be involved in the design, implementation, and evaluation of interventions to assure those efforts are responsive to local realities and can achieve their desired goals (CDC 2018).



## References

- Arens, A. M., van Wijk, X. M. R., Vo, K. T., Lynch, K. L., Wu, A. H. B., & Smollin, C. G. (2016). Adverse effects from counterfeit alprazolam tablets. *JAMA Internal Medicine*, 176(10), 1554–1555. <https://doi.org/10.1001/jamainternmed.2016.4306>
- Baldwin, G. T., Seth, P., & Noonan, R. K. (2021). Continued increases in overdose deaths related to synthetic opioids: Implications for clinical practice. *JAMA*, 325(12), 1151. <https://doi.org/10.1001/jama.2021.1169>
- Brunt, T. M., Nagy, C., Bücheli, A., Martins, D., Ugarte, M., Beduwe, C., & Ventura Vilamala, M. (2017). Drug testing in europe: Monitoring results of the trans european drug information (Tedi) project: drug testing in europe. *Drug Testing and Analysis*, 9(2), 188–198. <https://doi.org/10.1002/dta.1954>
- Burke, L. A., & Neimeyer, R. A. (2013). Prospective risk factors for complicated grief: A review of the empirical literature. In M. Stroebe, H. Schut, & J. van den Bout (Eds.), *Complicated grief: Scientific foundations for health care professionals* (p. 145–161). Routledge/Taylor & Francis Group.
- Caudevilla, F., Ventura, M., Fornís, I., Barratt, M. J., Vidal, C., Lladanosa, C. G., Quintana, P., Muñoz, A., & Calzada, N. (2016). Results of an international drug testing service for cryptomarket users. *The International Journal on Drug Policy*, 35, 38–41. <https://doi.org/10.1016/j.drugpo.2016.04.017>
- Centers for Disease Control and Prevention. (2018). Evidence-Based Strategies for Preventing Opioid Overdose: What’s Working in the United States. National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, U.S. Department of Health and Human Services. <http://www.cdc.gov/drugoverdose/pdf/pubs/2018-evidence-based-strategies.pdf>
- Dr. L. Smith, C. Kalus, P. Russell & T. C. Skinner (2009) Exploring current service provision for Prolonged Grief Disorder and suggestions for future advances, *Mortality*, 14:1, 53-69, DOI: 10.1080/13576270802591251
- U.S. Customs and Border Protection. (2021). CBP Enforcement Statistics Fiscal Year 2021.). Retrieved May 3, 2021, from <https://www.cbp.gov/newsroom/stats/cbp-enforcement-statistics>
- Coffin, P. O., Tracy, M., Bucciarelli, A., Ompad, D., Vlahov, D., & Galea, S. (2007). Identifying injection drug users at risk of nonfatal overdose. *Academic Emergency Medicine: Official Journal of the Society for Academic Emergency Medicine*, 14(7), 616–623. <https://doi.org/10.1197/j.aem.2007.04.005>
- Department of Health and Human Services. (2021). Practice Guidelines for the Administration of Buprenorphine for Treating Opioid Use Disorder. FR Doc. 2021–08961 Filed 4–27–21
- U.S. Food & Drug Administration. (2021, April 22). FDA Voices. <https://www.fda.gov/news-events/fda-newsroom/fda-voices>
- Community management of opioid overdose. (2014). World Health Organization. <https://www.who.int/publications-detail-redirect/9789241548816>

- Darke, S., & Duflou, J. (2016). The toxicology of heroin-related death: Estimating survival times. *Addiction* (Abingdon, England), 111(9), 1607–1613. <https://doi.org/10.1111/add.13429>
- Fentanyl signature profiling program report. (2019). U.S. Drug Enforcement Administration. <https://www.dea.gov/documents/2019/2019-10/2019-10-28/fentanyl-signature-profiling-program-report>
- Green, T. C., & Gilbert, M. (2016). Counterfeit medications and fentanyl. *JAMA Internal Medicine*, 176(10), 1555–1557. <https://doi.org/10.1001/jamainternmed.2016.4310>
- Klar, S. A., Brodtkin, E., Gibson, E., Padhi, S., Predy, C., Green, C., & Lee, V. (2016). Notes from the field: Fentanyl-fentanyl overdose events caused by smoking contaminated crack cocaine - british columbia, canada, july 15-18, 2016. *MMWR. Morbidity and Mortality Weekly Report*, 65(37), 1015–1016. <https://doi.org/10.15585/mmwr.mm6537a6>
- Mars, S. G., Rosenblum, D., & Ciccarone, D. (2019). Illicit fentanyls in the opioid street market: Desired or imposed? *Addiction* (Abingdon, England), 114(5), 774–780. <https://doi.org/10.1111/add.14474>
- Mattson, C. L. (2021). Trends and geographic patterns in drug and synthetic opioid overdose deaths—United states, 2013–2019. *MMWR. Morbidity and Mortality Weekly Report*, 70. <https://doi.org/10.15585/mmwr.mm7006a4>
- Pardo, B., Taylor, J., Caulkins, J., Kilmer, B., Reuter, P., & Stein, B. (2019). The future of fentanyl and other synthetic opioids. RAND Corporation. <https://doi.org/10.7249/RR3117>
- Reed, M. K., Roth, A. M., Tabb, L. P., Groves, A. K., & Lankenau, S. E. (2021). “I probably got a minute”: Perceptions of fentanyl test strip use among people who use stimulants. *The International Journal on Drug Policy*, 103147. <https://doi.org/10.1016/j.drugpo.2021.103147>
- Schepis, T. S., Klare, D. L., Ford, J. A., & McCabe, S. E. (2020). Prescription Drug Misuse: Taking a Lifespan Perspective. *Substance abuse : research and treatment*, 14, 1178221820909352. <https://doi.org/10.1177/1178221820909352>
- Shear M. K. (2010). Complicated grief treatment: the theory, practice and outcomes. *Bereavement care : for all those who help the bereaved*, 29(3), 10–14. <https://doi.org/10.1080/02682621.2010.522373>
- Tobias, S., Shapiro, A. M., Grant, C. J., Patel, P., Lysyshyn, M., & Ti, L. (2021). Drug checking identifies counterfeit alprazolam tablets. *Drug and Alcohol Dependence*, 218, 108300. <https://doi.org/10.1016/j.drugalcdep.2020.108300>
- Vlasto, Christopher, (2010), Therapists' views of the relative benefits and pitfalls of group work and one-to-one counselling for bereavement. *Counselling and Psychotherapy Research*, 10 doi: 10.1080/14733140903171220.
- World Health Organization. “Community management of opioid overdose.” (2014). Available at <https://www.who.int/publications-detail/9789241548816>

Substance Abuse and Mental Health Services Administration (SAMHSA). "Opioid treatment program guidance – updated 3/19/2020." Available at <https://www.samhsa.gov/sites/default/files/otp-guidance-20200316.pdf>

Zibbell JE, Aldridge AP, Cauchon D, DeFiore-Hyrmer J, Conway KP. (2019). Association of Law Enforcement Seizures of Heroin, Fentanyl, and Carfentanil With Opioid Overdose Deaths in Ohio, 2014-2017. *JAMA Netw Open*. 2019;2(11):e1914666.doi: 10.1001/jamanetworkopen.2019.14666

<https://www.govinfo.gov/content/pkg/FR-2021-04-28/pdf/2021-08961.pdf>

<https://www.trekmedics.org/beacon/overdose/>