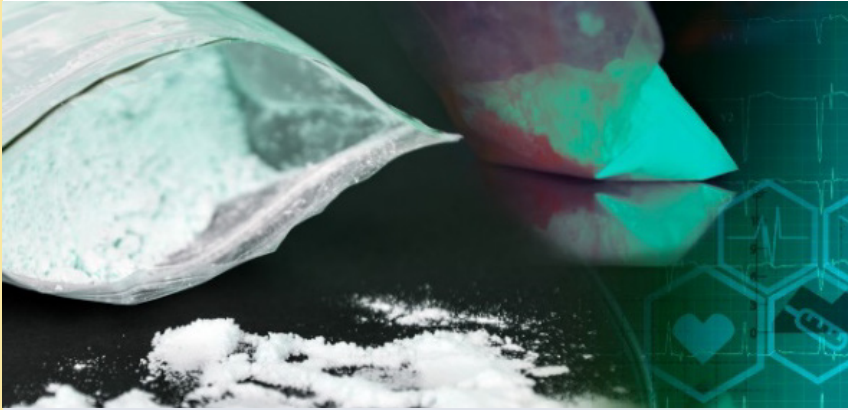




IN-BRIEF

An Introduction to Drug Checking and Its Role in Harm Reduction



“The synthetic drug supply has completely changed the nature of how people die—and we need to think about ways to change the response.”

*—Dr. Traci Green,
Professor, Brandeis University*

Background

Although the 1970 Controlled Substances Act criminalized possession and use of illicit drugs in the United States, drug use is still common. The 2020 National Survey on Drug Use and Health reported that 21% of respondents had used illicit drugs within the year.¹ Illicit drug consumption poses significant public health challenges, even if the drug itself may not confer health risks. The drug market itself is unregulated and dynamic, and people who use drugs (PWUD) may not be aware of the combination of drugs they are ingesting. Polydrug use and prevalence of fentanyl and its analogues contribute to an alarming upward trend of fatal overdoses. Provisional data on overdose deaths show that the United States reached over 107,000 overdose deaths in the 12-month period ending in December 2021.^{1,2} Overdose deaths related to opioids (natural, synthetic and semi-synthetic), psychostimulants, and cocaine all increased during this time frame.² In addition, injection drug use may lead to other health challenges such as soft tissue infection and increased spread of bloodborne diseases, like hepatitis and HIV.³

Objectives

- ▶ Provide an overview of harm reduction services and what value they provide to PWUD.
- ▶ Describe modes of drug checking within harm reduction settings, and offer observations and lessons learned from emerging drug checking needs.

Harm reduction consists of multiple tenets that have significant benefits and considerations. This brief focuses specifically on the value of tools and services for drug checking, such as the distribution of fentanyl test strips and the use of advanced technologies (e.g., portable mass spectrometer). This brief also notes engagement models that a harm reduction organization may use when offering drug checking services. This brief is intended for professionals who work in or provide ancillary services to public health and public safety, including harm reduction and justice programs.



Harm reduction organizations offer products and services that can reduce risks of drug consumption.

Initially developed in the 1980s, harm reduction is a set of strategies to help reduce health complications stemming from drug consumption.⁴ Harm reduction organizations provide resources that educate PWUD (and their family and friends) about safe drug use and help them make informed decisions without coercion, judgment, or threat of punitive action. The approach, first aimed at reducing HIV, acknowledges the realities of drug use and aims to “meet people where they are.”³ In addition to educational services, these sites may offer products such as clean syringes and naloxone, or healthcare services such as HIV testing.

With an increasingly unpredictable and dangerous drug supply, harm reduction sites have begun to offer products and services that help PWUD better understand what is in their drugs, referred to in this brief as “drug checking.” Drug checking can also serve the community when trends and insights from drug checking results are distributed in a timely manner. Sites can offer drug checking in a variety of modes. First, distribution of inexpensive, self-administered point-of-care testing strips that check for the presence of various drugs (e.g., fentanyl) are used. Second, sites may also offer services to test samples using field-portable presumptive screening instruments, such as mass spectrometry and Fourier-transform infrared (FTIR) spectroscopy instruments, which can provide a more in-depth view of what is in the drug sample.

This NIJ FTCOE brief was developed in collaboration with the Bureau of Justice Assistance’s Comprehensive Opioids, Stimulants, and Substance Abuse Program (COSSAP). COSSAP aims to reduce the impact of opioids, stimulants, and other substances through programmatic focus areas that include supporting access to treatment and recovery services in the criminal justice system and strengthening the collection and sharing of data across systems. For the purposes of this brief, people who use drugs, or PWUD, is a general term referring to any individual who consumes drugs and may benefit from harm reduction services.

Drug checking has been shown to assist decision making for PWUD.

Studies indicate that PWUD are willing and interested in accessing drug checking at harm reduction services. In a 2019 study of 334 PWUD in the Baltimore, Providence, and Boston areas, 89.5% indicated that drug checking measures such as fentanyl testing strips (FTS) would “make them feel better about protecting themselves from overdose.”⁵ A 2018 study surveying 129 PWUD in Greensboro, North Carolina, indicated that 81% of respondents reported using FTS prior to drug ingestion.⁶

PWUD not only use FTS before using a substance, but they may modulate their behavior in response to test results. In the 2019 study, 69.8% of participants indicated that they would change their behavior after drug checking, as did 43% of respondents in the 2018 Greensboro study. These behavior modifications, however, did not typically indicate discarding the substance, with only 26.1% of the 2019 Baltimore/Providence/Boston study respondents noting that they would refrain from using their drug supply because of the presence of fentanyl. Examples of behavior modifications include using a smaller drug quantity, using a small “tester shot,” adjusting ingestion method, using slower injections, and using in the company of others.^{5,6}

FTS make up the majority of drug checking harm reduction efforts, but they limited capabilities.

Many harm reduction sites procure and distribute FTS as their primary means of drug checking. These strips are inexpensive (typically less than \$1/test), portable, and simple to use with a small amount of training. Many sites rely on federal, state, or private grants to purchase these strips, and legislation is changing to enable more widespread FTS purchasing and distribution. In 2021, for example, the Centers for Disease Control and Prevention (CDC) and the Substance Abuse and Mental Health Services Administration (SAMHSA) approved the use of CDC/SAMHSA funds for purchase of FTS supplies.⁷ As of 2021, a majority of U.S. states still ban FTS, considering them to be “drug paraphernalia,”⁸ but many states, including New Mexico and Tennessee, are amending legislation to decriminalize FTS use.⁹

FTS can play an important role in enabling safe drug consumption as an effective harm reduction strategy.¹⁰ However, FTS only provide an **indication** of fentanyl



presence and not **confirmation** of presence; as such, strips are limited by potential false positive or false negative results. For example, high concentrations of some stimulants or cutting agents may cause false positive fentanyl results using FTS.¹¹ As a paper-based colorimetric immunoassay, FTS may be misread in low light conditions. A 2017 FTS pilot study conducted by San Francisco’s Drug Overdose Prevention and Education (DOPE) Project and the Syringe Access Collaborative noted that test strips may show faint lines for negative test results, which may be interpreted as a false positive.¹²

Although FTS can indicate that fentanyl is present in the drug sample, they cannot quantify how much of the drug is in the sample, which could help the consumer understand how much to safely ingest. FTS cannot provide additional information on what else may be in the sample, such as toxic cutting agents or additional drugs.

In the [2019 study of PWUD preferences in Baltimore, Boston, and Providence](#), data showed that PWUD were interested in understanding more information about their drug samples that current FTS may not be able to provide. For example, roughly 85% of study participants noted that they would like to know the amount of fentanyl in the sample, and 87% were interested in understanding the cutting agents and other drugs present in the sample.

Advanced drug checking technology offers benefits for harm reduction but has limitations.

Harm reduction organizations may look to field-portable drug checking instruments to help them identify and possibly quantify the drugs present in a sample.

Organizations may choose from several laboratory-developed technologies that have been miniaturized and adapted for field use, including mass spectrometers, ion mobility spectroscopy instruments, FTIR spectroscopy, and Raman spectroscopy. These instruments can provide a more comprehensive view of what is in the drug sample—many instruments can identify and quantify what drugs and cutting agents are present in a sample. Some harm reduction organizations have already adopted these instruments for drug checking: for example, organizations in [Boston](#),

[Massachusetts](#); [Chicago, Illinois](#); and [Greensboro, North Carolina](#) have implemented or conducted a pilot program for some type of field-portable presumptive testing instrument for drug checking purposes.

Harm reduction agencies should be aware of the following:

- Some instruments, like Raman spectrometers, can scan the sample through a plastic baggie, minimizing the need to handle the substance outside of its packaging. Some mass spectrometer and ion mobility spectroscopy instruments, can detect trace amounts of drugs whereas others like Raman and FTIR spectrometers may need larger amounts.
- These instruments can passively track test result data, which can be aggregated and analyzed.
- Most of these instruments were built for a layperson to easily understand and operate, though interfaces may differ significantly across vendors and instrument types. Some can provide a text-based answer (e.g., “cocaine” and “fentanyl”), whereas others provide a spectrum that must be interpreted using a software-based library.¹³ These instruments are more advanced than FTS and will require more training to use. In some cases, a background in chemistry is helpful when reviewing data from instruments like FTIR spectrometers. Moreover, reviewing mass spectral data requires additional training and specialized laboratory skills. Many advanced presumptive drug testing instruments are costly (easily costing upwards of \$65,000 per instrument) and require training, additional consumables, and maintenance costs (e.g., subscriptions to electronic libraries, testing strips).¹³
- Although these instruments are built to operate in a field setting, operators may prefer to use them in a fixed setting.
- FTS typically takes a few minutes for sample analysis. Other instrumentation like FTIR spectrometers may take 10–15 minutes per sample but are able to provide more information than indication of fentanyl.

For more information on available presumptive drug testing instruments, check out the [FTCoE’s Landscape Study on Presumptive Drug Testing Instruments](#).



Incorporating Drug Checking Equipment and Services into Different Models of Harm Reduction Programs

Effective harm reduction is human-centered: it meets individuals where they are, aiming to educate and equip. Harm reduction includes any positive change that can improve health outcomes for PWUD; abstinence is a potential pathway through harm reduction, but it is not the chief outcome. Harm reduction programs may use a variety of approaches to offer drug checking products and services to PWUD, including “brick-and-mortar” sites, “pop-up” or mobile sites, delivery services, and mail supply distribution.

Fixed sites


Establishing a permanent location provides the community with consistent access to harm reduction services. As a brick-and-mortar, organizations can easily offer additional services (e.g., healthcare). Permanent structures may be easier to configure for private rooms used for consultations or meeting spaces. Operators of advanced drug checking instruments, such as a portable mass spectrometer, may feel more comfortable using these instruments at a fixed site where the instrument remains stationary and the operator has more room to work and troubleshoot if needed.¹³ These sites may accommodate a higher volume of constituents than some of the alternative approaches. However, maintaining a permanent space requires investments for leasing and utilities, and strategy to locate the site in an area easily accessible to PWUD.


Mobile or pop-up sites

Organizations can create pop-up sites with the help of mobile units, like a transit van. This approach can vary in complexity such as distributing supplies from a vehicle (e.g., FTS, naloxone, clean syringes, and education materials) to providing health services from a certified clinical laboratory (e.g., Clinical Laboratory Improvement Amendments [CLIA] certified). The CLIA-certified unit could include operation of advanced drug checking instruments, basic healthcare services such as HIV/Hepatitis C testing, case management services, and over-the-counter medicine distribution.^{14,a} Unlike operating a fixed location, mobile units may be more affordable to operate full time and allow harm reduction programs to reach more neighborhoods, including people who cannot easily access fixed sites.


Organizations using mobile sites may consider channels that communicate their site’s location schedule, so that they may reach their target audience effectively. Mobile sites may be limited by the amount of supplies they can distribute within

a given period or the types of services that can be provided from a mobile unit (e.g., showering facilities and more comprehensive health services). However, organizations may link with local partners such as community and religious centers to enhance the services offered when setting up mobile harm reduction sites.

A variation of the pop-up model for drug checking includes harm reduction events at music festivals. Although more sporadic, providing drug checking services and educational resources at events carries great value for reaching PWUD who may not be aware that drug checking services exist or that fentanyl is present in a lot more drugs than often perceived. Organizations such as [DanceSafe](#)  have been providing drug checking services for close to 20 years.¹⁵ Outreach during festivals or nightlife events like these also provides a good opportunity for naloxone training and distribution.

The Kraft Center for Community Health at Massachusetts General Hospital published a [Mobile Addiction Services Toolkit](#) , which provides helpful guidance for implementing a mobile unit with harm reduction services.

Delivery and Mail-Based Services

In this model, PWUD can contact an organization to request supplies that are either mailed or dropped off at their residence or another location of choice. This way, PWUD can access FTS, clean syringes, and overdose reversal kits even if they do not physically have access to a harm reduction site. This model has proven popular as a standalone solution—such as the [Needle Exchange Technology \(NEXT\) Harm Reduction program](#) —or in conjunction with existing outreach such as with Challenges Inc. in South Carolina,

^a U.S. government agencies like FDA, CDC, and CMS require healthcare and laboratory testing facilities to be CLIA-certified to regulate laboratories testing

human specimens. CLIA laboratories follow standards to help ensure accurate, reliable, and timely patient test results are performed.



which also operates a mobile unit (see the case study on [Challenges Inc.](#) below).¹⁶

Although mail-based services offer greater opportunity for PWUD who live more remotely or do not have harm reduction programs nearby, this approach limits the opportunity for other components of harm reduction that require direct engagement. This includes services such as counseling, basic healthcare, and access or referrals to other facilities and resources. These drawbacks can partially be alleviated by including educational materials with the mail packages, but they still require initiative from the PWUD to access those resources. Location visits by harm reduction providers still allow for a greater degree of interaction between harm reduction agencies and PWUD but similarly lack in opportunities to provide more exhaustive services such as meals, health checks, and peer support.

Non-traditional Supply Distribution

Harm reduction programs are actively developing new ways to reach PWUD who may benefit from FTS and drug checking services. The [Safety Outreach Autonomy Respect \(SOAR\)](#)

Lessons Learned

Harm reduction organizations are challenged by a consistently changing landscape of drug trends, technology, public perception, and policy. Interviews with harm reduction coordinators and resources highlighted the following lessons learned.

Evolving drug trends highlight the importance of drug checking and needs to widen the circle of individuals who could benefit from drug checking services.

In the early 2010s, fentanyl was introduced in the Eastern United States to the illicit drug market by clandestinely adding it to powder heroin solutions; today, it is also found in drug solutions sold as stimulants such as cocaine and methamphetamine.¹⁹ Because of the expansion of fentanyl across different drug categories, polydrug use, and the emergence of new psychoactive substances, more PWUD are at risk of harm, and these drug supply changes can hinder the provision of appropriate treatment during an overdose response.

[Initiative](#) in Ohio provides training to nightlife business staff to use naloxone and provides FTS that can be offered to customers. In Massachusetts, 28 municipal and local police departments formed [Plymouth County Outreach](#), which offers resources to the community such as FTS and naloxone.

PWUD, who may only use drugs like cocaine, Xanax, or other stimulants irregularly, are often unaware fentanyl is becoming more common in the drug supply. Engagement from community partners can help increase awareness of and access to potentially life-saving resources and can help normalize drug checking.

The use of vending machines for naloxone or safe use supplies is an emerging distribution strategy in the United States. Nevada was the first state to pilot distributing syringes and other harm reduction supplies through vending machines, followed by Ohio. Most recently, New York announced the development of a similar program.^{17,18} These distribution mechanisms may be used to distribute FTS or mail-in drug checking kits in the future.

Although many PWUD are aware of and modulate their drug consumption behavior around potential fentanyl contamination, others may not be aware.²⁰

Beyond fentanyl, changing trends in drug use has made acute response to overdoses challenging. Polydrug use was involved in 37% of non-fatal drug overdoses treated in emergency departments from 2017 to 2018.²¹ A trending example is xylazine as an adulterant within the drug supply.²⁰

These trends challenge harm reduction agencies to pursue strategies and engagement approaches. These observations are detailed in case study of Challenges Inc., a harm reduction organization based in Greenville, South Carolina.



Challenges Inc. aims to enhance access to FTS, syringes, and naloxone through multiple engagement methods.

Marc Burrows, Challenges Inc.'s founder, started the program with firsthand knowledge of addiction and the associated public health challenges.

Challenges Inc. offers harm reduction services including needle exchange services, health checkups, FTS, and overdose reversal kit distribution to the residents of greater Greenville, South Carolina. They typically distribute around 1,000 naloxone doses a month, making Challenges Inc. the largest distributor in South Carolina. Challenges Inc. is a grassroots organization supported mostly by private donations and small foundational grants. They currently support individuals through two models: (1) a mobile unit that can access different parts of the community and (2) mail-based services to reach rural parts of South Carolina. To date, Challenges Inc. is still the only harm reduction program offering syringe services in South Carolina.

Through leading Challenges Inc, Marc Burrows noted the following key lessons learned:

- **FTS do not always reach those who may benefit the most.** Most PWUD are aware of fentanyl in their drug supply. Although FTS can help create a feeling of bodily agency (i.e., feeling of power over drug use) or indicate fentanyl presence in drug batches from new drug sellers, it often does not provide value-adding information because it does not quantify the amount of fentanyl in the sample.²² PWUD who only use stimulants may not be aware of FTS or think that they need to test for fentanyl in their drug supply. For consumers who do not typically anticipate fentanyl in their samples, a positive FTS provides crucial information. However, FTS have not been used to reach this demographic in South Carolina by the typical community distributor, as doing so would require having open and honest conversations with these consumers and a tailoring to stimulant consumers. Reaching this expanded base of PWUD is challenging for grassroots organizations.
- **Advanced drug checking is value-adding but cost-prohibitive.** Mass spectrometry-based drug checking services would be powerful because they provide qualitative and quantitative information beyond a “yes/no” for fentanyl, which can be used to better inform PWUD on drug trends, cutting agents, and other insights. However, they are expensive to obtain and operate for underfunded organizations.
- **Supply distribution models should align with consumer needs and preferences.** Challenges Inc. and other organizations strive to deliver simple, dignified, and non-pressuring services. For example, their mail-based service collects a mailing address and name, but no other verification is needed to receive supplies. Collecting less intrusive information makes access easier for PWUD who may be uncomfortable with providing too much information.
- **Harm reduction still faces barriers.** Politics, religion, and lack of awareness on the goals and value of harm reduction remain the main barriers to widespread acceptance and increased funding.

“FTS is a bittersweet topic—it’s a great resource and there’s funding available to purchase test strips, but FTS can be overblown and overly relied on. They have a purpose, but I’m unsure whether we can get them in the hands of the right people.”

—Marc Burrows



As funding, public perception, and other barriers to drug checking services lower, organizations will need to clarify their future role.

Although drug checking services in harm reduction organizations are often used solely for informing PWUD, they could be used for other purposes (e.g., a coordinated response to a mass overdose event). As drug checking is normalized, these organizations may interface with local public health organizations to understand if and how their resources may be used in response to a crisis. Beyond informing individual PWUD, drug checking provides community-level awareness of drug trends.

Challenges from the current drug landscape highlights data needs for PWUD.

A key goal of harm reduction is to enhance access to information that helps PWUD reduce the risk of adverse health effects from drug consumption. As these organizations adopt drug checking, they may be well-positioned to inform local PWUD about emerging drugs, dangerous batches, and other important trends. While there may be increasing opportunities to collect these important data, there is a need to disseminate this information to the appropriate PWUD.

Harm reduction coordinators emphasized the need for centralized, easily accessible data about emerging drugs that is consumer-centered. Although there are systems such as the [National Drug Early Warning System](#), the European Monitoring Centre for Drugs and Drug Addiction [Early Warning System on Novel Psychoactive Substances \(NPS\)](#), the Drug Enforcement Administration's [National Forensic Laboratory Information System](#), and [NPS Discovery](#) websites that offer helpful information on drug trends to state, federal, and local entities such as public health agencies, forensic laboratories, law enforcement, and medical examiner and coroner offices, these resources may be difficult to access or interpret from a PWUD's standpoint.

Drug consumers not only want to be informed of a drug's presence but also how it affects PWUD, how it is ingested, and its physical appearance (form). Dr. Traci Green, an epidemiologist at Brandeis University, emphasized the need for the development of a consumer-centered data sharing approach that engages and encourages participation for PWUD (see the case study below). Some organizations have made efforts toward creating accessible, consumer-friendly early warning systems that can inform PWUD. [Drugdata.org](#), for example, is an Erowid Center program that crowdsources laboratory testing results to help inform PWUD of drugs on the market.

This information should be easily accessible to PWUD and available through various media (e.g., text messages, public boards). A recent example is through the [Street Check Drug Checking App](#), which was developed in partnership between the North Carolina Urban Survivors Union, Brandeis University, and the University of North Carolina Injury Prevention Research Center.

Data collection may also help inform harm reduction organizations.

The impact of harm reduction is difficult to comprehensively quantify, but many organizations find value from tracking metrics and trends (e.g., the number of individuals using their services, number of FTS and naloxone distributed, the number of overdose reversals). Harm reduction sites may collect data for justifying federal or private grant funding or to demonstrate the impact of the organization to community partners. They may also use these data to identify demand and unmet needs for services (e.g., the number of FTS requested versus the amount they are able to distribute). They may distribute these data to help emerging harm reduction organizations strategically position themselves in areas that do not lead to service redundancy.



Data sharing between all who are interfacing with PWUD is vital to maximize the impact of harm reduction.

Dr. Traci C. Green is the director of Brandeis University's Opioid Policy Research Collaborative at the Heller School for Social Policy and Management. Dr. Green's research focuses on drug use, opioid use disorder, and drug-related injury.^b

As an epidemiologist, Dr. Green is involved in a wide range of projects related to drug use, prevention, harm reduction, and drug checking services. With the rise and prevalence of synthetic drugs changing the nature of how PWUD die of overdoses, Dr. Green is working on developing new ways to respond to these ever-changing challenges.

The need for **transparency, communication, and active sharing of data** between PWUD, non-profits, state health departments, academia, and law enforcement remains a major challenge, but doing so stands to drastically increase the capacity to respond to changes in the drug supply and to better serve and help PWUD. Dr. Green noted some examples based on her experience launching community drug checking services:

“We often look at drug samples in a way that is disconnected from the user itself, and that’s valuable information lost.”

—Dr. Traci Green

- **Drug databases and early warning systems should be built for—and gather information from—PWUD’s perspective.** Systems created to inform PWUD about drug trends should be readily accessible and easy to interpret. More importantly, this information needs to communicate key details that can help PWUD better understand the risks of the supply chain in their local area. It is not enough to know that fentanyl is in the drug supply—PWUD must know *how* it and other substances are present within the supplied drug; powder and pill description; their relative strength and how the drug was consumed; how it affected the consumer; source information, including markings; if there was a bad reaction associated with it; and more. Much of this information is known only to the person who obtained it or used it.
- **PWUD play a key role in sharing knowledge.** In a community drug checking program, PWUD share information about the drug supply with harm reduction programs and public health agencies by providing samples for testing, thereby providing an opportunity to other PWUD to become better informed.
- **Distributable drug checking technology, like FTS, expand reach and overdose prevention prospects.** The low-cost and easy-to-use FTS provide opportunities to disseminate education and fentanyl awareness in more places and to more people at risk of fentanyl overdose. FTS have utility beyond just testing for fentanyl presence – they provide a teaching and training opportunity, which could propel a wider acceptance, trust, and support of harm reduction.
- **Drug checking can be powerful, but there is still a big need for scalable and affordable devices and strategies** that require innovation and investments from both government and private industry.
- **Collaboration is key.** Harm reduction programs, treatment centers, state health departments, and law enforcement agencies need to break out of their siloed approach and collaborate more actively to extend their reach and impact and help PWUD more effectively. This will require increased trust, good policy, and funding support.
- **PWUD engagement should be varied, and there is no “right” model.** No model for dissemination of harm reduction and drug checking supplies fits all 50 states, and there is variability even within large states. The ability to host a range of program types—such as local FTS distribution, mail-based services, walk-in facilities, or mobile testing vehicles—will be most effective in engaging PWUD and improving health outcomes. These engagement methods should be person-centered, and leverage people who have lived through addiction.

^b Throughout her career, she has designed and spearheaded numerous harm reduction and drug checking initiatives, such as ASI-MV®, which tracks illicit and prescription drug abuse in real time. Dr. Green also co-founded www.prescribeto prevent.org and www.prevent-protect.org to promote and facilitate naloxone access for overdose treatment. Dr. Green also consults for CDC on public health and public safety opportunities and has served on committees for the National Academy of Sciences on topics related to opioid pain management, regulatory strategies to address opioids, and medications for treating opioid use disorder.



Building community partnerships is vital to the success of the harm reduction organization.

Harm reduction programs serve a unique role in linking PWUD, who are often marginalized and stigmatized, to the greater community. Their relationship with community members—especially key members such as law enforcement—may dictate the nature of interactions that these members experience with PWUD. Law enforcement agencies realize their critical role in helping combat the opioid crisis. Organizations such as PAARI, the Police Assisted Addiction & Recovery Initiative, work with over 700 law enforcement agencies in 40 states to help establish new entry points to treatment and recovery. These include police agency-driven projects to distribute at-home drug checking materials such as FTS within their local community network, greatly increasing the opportunities for contact, connections, and trust between law enforcement and PWUD.

Interviews with harm reduction organizations revealed that many community members should be at the table in collaboration with these organizations. Public health entities, first responders such as emergency medical technicians, medication-assisted treatment centers, detoxification centers, community and religious centers, night clubs, recreation facilities, and hotels are all important partners in the conversation because they all interact with PWUD daily but in vastly different capacities. Individuals with lived experience can bring an effective and empathetic approach.²³ These community partners can act as extensions of the harm reduction organization—they may be able to distribute supplies, educate, and help reduce overdoses while establishing evidence-based treatment and recovery pathways. These members can also help educate and shift the mindset of addressing the opioid crisis.

Conclusion

The use of drug checking as an integral part of harm reduction programs is gaining traction throughout the United States. However, current common drug checking technologies, primarily FTS, remain limited in their applicability beyond testing for fentanyl. Harm reduction programs express needs for powerful on-market drug checking technology, which offer value-adding information beyond fentanyl presence, but they often remain prohibitively expensive to procure and operate. State-funded or academic programs that conduct drug analyses employ more powerful and accurate analysis equipment, but information on drug composition and contamination obtained through these partners is often inaccessible to PWUD. The need for better data aggregation and dissemination across all partners and consumers is recognized throughout many of the involved parties, but there remains a lack of supporting platforms and policies to facilitate this exchange of information.



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