

# NIOSH Responds to the U.S. Drug Overdose Epidemic

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## Abstract

The United States is experiencing an evolving and worsening drug overdose epidemic. Although the rate of drug use among workers has remained relatively stable, the risk of overdose and death among drug users has not, as illicit drugs have increased in potency and lethality. The cumulative impacts of COVID-19 and the opioid crisis increase the likelihood of illness and death among workers with opioid use disorder. Workplaces represent a critical point of contact for people living in the United States who are struggling with or recovering from a substance use disorder, and employment is a vital source of recovery “capital.” The benefits of addressing substance use in the workplace, supporting treatment, and employing workers in recovery are evident. The National Institute for Occupational Safety and Health has published research to inform policy and practice toward prevention efforts and has developed accessible resources and toolkits to support workers, employers, and workplaces in combatting the opioid overdose crisis and creating safer, healthier communities.

## Keywords

drug overdose, opioids, recovery, worker safety and health, total worker health

## Introduction: Substance Use and Work

The United States is in the midst of an evolving and worsening drug overdose epidemic. There were 70,630 drug overdose deaths in the United States in 2019,<sup>1</sup> and nearly 50,000 of those deaths involved opioids.<sup>2</sup> This translates to 136 people in the United States dying each day from opioid overdose. Drug overdose deaths increased almost 5% just from 2018 to 2019, and a growing proportion of overdose deaths involve synthetic opioids other than methadone, including illicitly manufactured fentanyl.<sup>2</sup> Although data from the National Survey on Drug Use and Health show that rates of opioid misuse and use disorder have remained relatively stable over time, the increasing potency and lethality of illicit drugs on the market has likely led to more and more lives lost to overdose.<sup>3</sup> These stark trends are playing out similarly among workers and in workplaces across the nation. According to the 2019 National Survey on Drug Use and Health, more than 63.0% of self-reported past-year illicit opioid users aged 18 and up were employed full- or part-time.<sup>4</sup> In 2019, the Bureau of Labor Statistics reported that overdose deaths at work from non-medical use of drugs or alcohol increased for the seventh year in a row to 313, with

workplace overdose deaths accounting for nearly 6% of occupational injury deaths that year.<sup>5</sup>

The overdose epidemic is having disparate impacts across the work force. Morano et al.<sup>6</sup> found that physically demanding industries with difficult working conditions and high rates of injury may be associated with a higher risk for overdose. Work-related pain and injury may contribute to first exposure to opioids through a prescription and may lead to the initiation of opioid misuse and perpetuation of opioid misuse and opioid use disorder (OUD). Construction and extraction (mining, oil, gas) occupations have some of the highest rates of opioid overdose deaths.<sup>6</sup> Other job factors, such as high job demands, job insecurity, and lack of control over job tasks may also lead to opioid misuse.<sup>7,8</sup>

Although the rate of drug use among workers has remained relatively stable, the risk of overdose and

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death among drug users has not, as illicit drugs have increased in potency and lethality.<sup>9</sup> In recent years, the surge in overdose deaths has been primarily driven by synthetic opioids, such as illicitly manufactured fentanyl (see Figure 1).<sup>2</sup> Synthetic opioids are extremely potent and commonly present in the illicit drug supply across the United States, including in mixtures with other drugs. Although co-use of synthetic opioids with other

drugs can be deliberate, individuals may also unknowingly and inadvertently consume products adulterated with illicitly manufactured fentanyl or fentanyl analogs (see Figure 2). Deaths involving psychostimulants, such as methamphetamine, are also rising, likely due to similar increases in potency, availability, and reduced cost. The largest increases in synthetic opioid deaths have occurred in western states, whereas historically, deaths

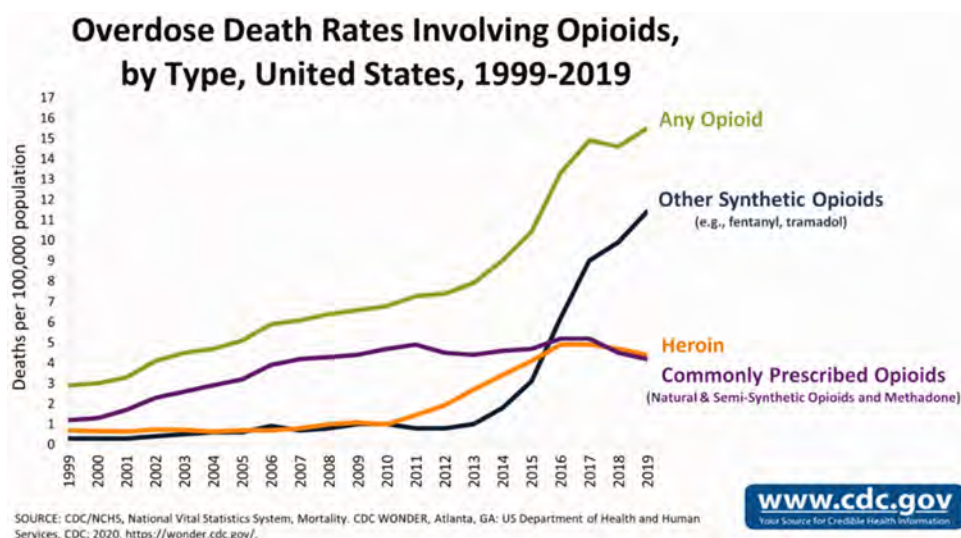


Figure 1. Overdose death rates involving opioids, by type, United States, 1999–2019.

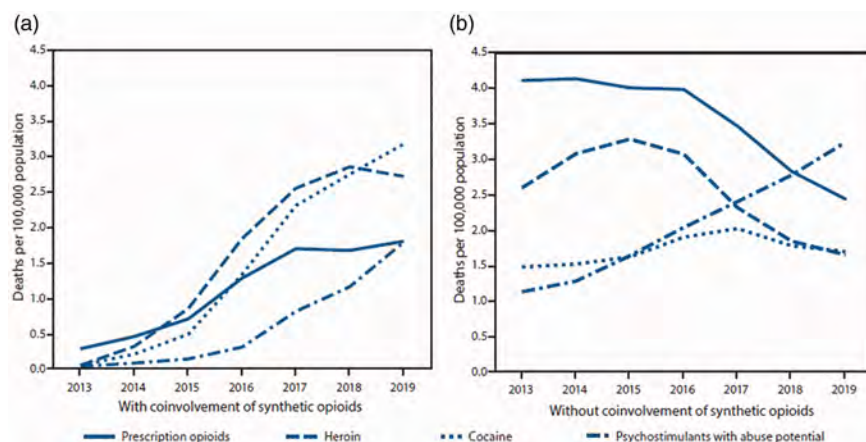


Figure 2. Age-adjusted rates of drug overdose deaths<sup>a</sup> involving prescription opioids,<sup>b</sup> heroin,<sup>c</sup> cocaine,<sup>d</sup> and psychostimulants with abuse potential,<sup>e</sup> with (a) and without (b) synthetic opioids other than methadone<sup>f,g</sup>—United States, 2013–2019.

Source: Mattson et al.<sup>2</sup>

Rate per 100,000 population age-adjusted to the 2000 U.S. standard population using the vintage year population of the data year.

<sup>a</sup>Deaths were classified using the *International Classification of Diseases, Tenth Revision*. Drug overdoses are identified using underlying cause-of-death codes X40–X44 (unintentional), X60–X64 (suicide), X85 (homicide), and Y10–Y14 (undetermined).

<sup>b</sup>Drug overdose deaths, as defined, that involve natural and semisynthetic opioids (T40.2) or methadone (T40.3).

<sup>c</sup>Drug overdose deaths, as defined, that involve heroin (T40.1).

<sup>d</sup>Drug overdose deaths, as defined, that involve cocaine (T40.5).

<sup>e</sup>Drug overdose deaths, as defined, that involve psychostimulants with abuse potential (T43.6).

<sup>f</sup>Drug overdose deaths, as defined, that involve synthetic opioids other than methadone (T40.4).

<sup>g</sup>Because deaths might involve more than one drug, some deaths are included in more than one category. In 2019, 6.3% of drug overdose deaths did not include information on the specific type of drug(s) involved.

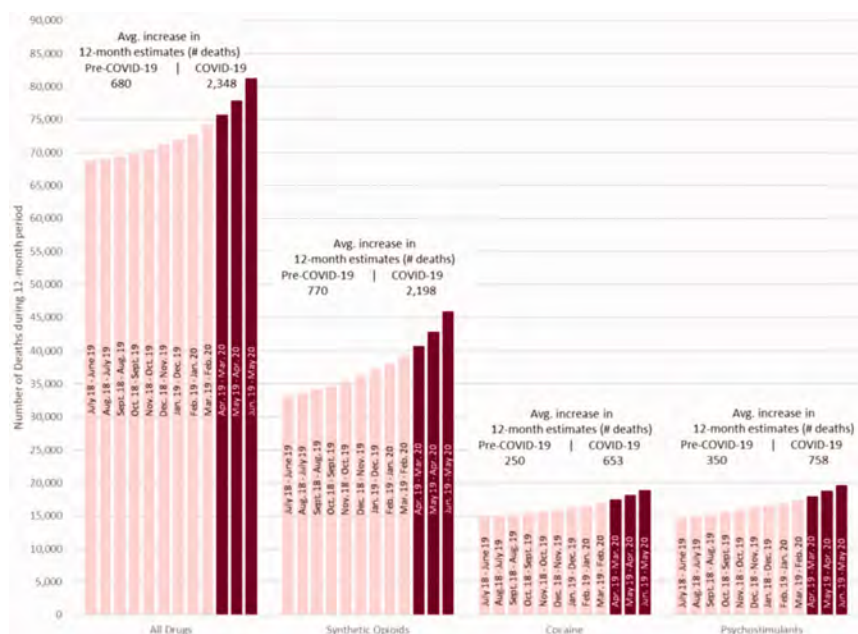
have been concentrated in eastern states, representing a shift from a predominantly white powder heroin market in the east to increasingly available illicitly manufactured fentanyl in the west.

## COVID-19 and Opioid Overdose: A “Perfect Storm”?

The United States was already experiencing a deadly opioid overdose epidemic when the COVID-19 pandemic took hold. The co-occurrence of these alarming and fatal public health crises has created what some have

called “the perfect storm for folks who are substance dependent.”<sup>10</sup> Nearly every state in the country has reported increases in opioid-related mortality since the start of the pandemic<sup>11</sup> (see Figure 3), and the SAMHSA disaster distress helpline reported an exponential increase in calls in 2020 compared to the same period the year prior.<sup>12</sup>

The cumulative impacts of COVID-19 and the opioid crisis increase the likelihood of illness and death among workers struggling with OUD.<sup>13</sup> Individuals with OUD face unique barriers that may put them at higher risk for severe illness from COVID-19. They may be more likely



**Figure 3.** Twelve-month provisional (a) drug overdose death counts for all drugs (b), synthetic opioids (c), cocaine (d), and psychostimulants (e), for fifty states, the District of Columbia, and New York City: twelve months ending in June 2019 to twelve months ending in May 2020 (f).

**Source:** Centers for Disease Control and Prevention. CDC Health Alert Network: Increase in Fatal Drug Overdoses Across the United States Driven by Synthetic Opioids Before and During the COVID-19 Pandemic. December 17, 2020. <https://emergency.cdc.gov/han/2020/han00438.asp>

= Pre-COVID-19.

= Includes COVID-19 period.

<sup>a</sup>Provisional drug overdose death counts are based on death records received and processed by NCHS. Provisional drug overdose death data are often incomplete, and the degree of completeness varies by jurisdiction and twelve-month ending period. Consequently, the numbers of drug overdose deaths are underestimated based on provisional data relative to final data and are subject to random variation. Provisional data are based on available records that meet certain data quality criteria at the time of analysis and may not include all deaths that occurred during a given time period. Therefore, they should not be considered comparable with final data and are subject to change. The counts used in this analysis are the “predicted” values. Predicted provisional counts represent estimates of the number of deaths adjusted for incomplete reporting.

<sup>b</sup>Deaths were classified using the International Classification of Diseases, Tenth Revision (ICD-10). Drug overdose deaths were identified using underlying cause-of-death codes X40–X44, X60–X64, X85, and Y10–Y14. The drug classes are all nested within all drug overdose deaths, but multiple drug classes may be involved in a single drug overdose death.

<sup>c</sup>Drug overdose deaths, as defined, that involve synthetic opioids other than methadone (T40.4).

<sup>d</sup>Drug overdose deaths, as defined, that involve cocaine (T40.5).

<sup>e</sup>Drug overdose deaths, as defined, that involved psychostimulants with abuse potential (T43.6).

<sup>f</sup>Included time periods will have some amount of overlap. For example, the twelve months ending in June 2019 (i.e., July 2018 to June 2019) includes deaths occurring in June 2019, which is also included separately in twelve months ending in May 2020 (i.e., June 2019 to May 2020).



to lack health knowledge,<sup>14</sup> access to harm-reduction services,<sup>14</sup> and reliable Internet service to access information about the pandemic.<sup>15</sup> Individuals with OUD may also have difficulty accessing provisions needed for safely sheltering in place.<sup>15</sup> The harmful impacts that opioids can have on lung and heart health,<sup>16</sup> coupled with a higher prevalence of underlying medical conditions and tobacco use,<sup>17</sup> may also put people with OUD at higher risk for severe illness from COVID-19. Furthermore, individuals with SUDs are often stigmatized and underserved in healthcare settings, which may be exacerbated when hospitals and clinics are pushed to capacity with COVID-19 cases.<sup>16</sup>

Measures aimed at reducing the spread of COVID-19, such as social distancing and business closures, may inadvertently increase harms related to OUD.<sup>13</sup> Temporary closures of treatment clinics and disruptions to harm reduction programs may lead to increased sharing and re-using of drug-use equipment, increasing the risk of COVID-19 and other transmissible diseases.<sup>18,19</sup> Pandemic measures have created a scarcity of healthcare resources, including access to medications for OUD.<sup>20</sup> Economic and social disruptions, like job losses and border crossing restrictions, may reduce access to the usual drug supply and lead to more harmful drug use patterns and greater exposure to more dangerous drugs.<sup>15,18,19</sup> Social distancing may lead to isolation and inadvertently conceal a surge of opioid misuse and mental health issues.<sup>21</sup> The choice to practice social distancing represents a difficult tradeoff between reducing the risk of COVID-19 exposure and potentially increasing the risk of overdosing alone with less opportunity for bystander administration of life-saving naloxone in the case of an overdose.<sup>13,15,18,22</sup>

Once the COVID-19 pandemic ends, whenever that may be and whatever that will look like, the challenges and implications for workers with SUDs will remain. Workplaces represent a critical point of contact for Americans struggling with or recovering from an SUD, and employment is a vital source of recovery “capital.” Recovery capital is defined by Cloud and Granfield as, “the breadth and depth of internal and external resources that can be drawn upon to initiate and sustain recovery from severe AOD [alcohol and other drug] problems.”<sup>23,24</sup> Recovery capital derived from employment can include access to health and financial benefits, vocational skills, a sense of purpose and self-efficacy, and social connection.

### Opioid Misuse, Use Disorder, and Overdose: Workplace Impacts and Opportunities

As trends shift across the United States, the opioid crisis continues and worsens, and it is evident in workplaces as well. A National Safety Council (NSC) survey<sup>25</sup> found

that while 75% of employers report that opioid use has impacted their workplace, only 17% report being extremely well-prepared to address the issue, revealing an urgent need for workplace resources. Furthermore, only four in ten employers would return an employee to work after the employee receives treatment for misusing prescription opioids, even though workers in recovery have been shown to be productive employees. For example, according to another study from NSC,<sup>26</sup> workers in recovery take eight days off annually compared to the nearly twelve days off taken by workers without SUDs. Workers in recovery also tend to stay in jobs longer, miss fewer days of work, are less likely to be hospitalized, and have fewer primary care visits. By employing workers in recovery, employers may avoid more than \$8000 annually in turnover, replacement, and healthcare costs. The benefits of addressing substance use in the workplace, supporting treatment, and employing workers in recovery are evident.

### NIOSH Resources to Address Substance Misuse, SUDs, and Overdose

The Occupational Safety and Health Act of 1970 established the National Institute for Occupational Safety and Health (NIOSH) as part of the U.S. Centers for Disease Control and Prevention, in the U.S. Department of Health and Human Services. It is a research agency focused on the study of worker safety and health, with a mission<sup>27</sup> to empower employers and workers to create safe and healthy workplaces and a mandate to assure “every man and woman in the Nation safe and healthful working conditions and to preserve our human resources.” Opioid misuse and overdose and the impact on occupational safety and health is a critical component of the NIOSH strategic plan and program portfolio. The four-pronged NIOSH approach<sup>28</sup> (see Figure 4) to combatting opioid harms includes determining the antecedent factors for opioid over-utilization among workers; identifying opioid use conditions that affect workers; developing strategies for protecting and assisting workers involved in the opioid crisis response;



**Figure 4.** Opioids in the workplace: NIOSH framework.<sup>25</sup>

and developing methods for opioid detection and decontamination of workplaces. In implementing this framework, NIOSH obtains relevant data to characterize and address the opioid crisis in workers; conducts field investigations, exposure surveys, and research studies to determine the extent of opioid exposures and best approaches to prevention; develops information and knowledge to address the problem; and transfers knowledge to all stakeholders and agencies to promote effective interventions.

Opioid misuse and overdose are issues broadly impacting workplaces, from the worker to the worker's co-workers, staff, family, and community. As the lines between those environments have been drastically blurred in the wake of the COVID-19 pandemic, it is more important than ever to use a coordinated systems approach to meet the needs of employers and workers. NIOSH applies *Total Worker Health*<sup>®</sup> principles and strategies to combat opioid harms, which involves the integration of protection from work-related safety and health hazards with promotion of injury and illness prevention efforts to advance worker well-being.<sup>29</sup> NIOSH has published research to inform policy and practice toward prevention efforts and has developed accessible resources and toolkits to support workers, employers, and workplaces in combatting the opioid crisis and creating safer, healthier communities. These resources include information on naloxone administration to reverse opioid overdose, how to keep first responders to an overdose scene safe, and supporting treatment and recovery in the workplace.

### ***Naloxone to Reverse Opioid Overdose***

Naloxone hydrochloride (also known as naloxone, NARCAN<sup>®</sup> or EVZIO<sup>®</sup>) is a drug that can temporarily stop many of the life-threatening effects of overdoses from opioids. It can be given nasally to a person suspected of overdose, allowing trained lay persons to administer the drug without injection. By helping to restore breathing and reverse sedation and unconsciousness, timely administration of naloxone can save the life of a worker or member of the public who has overdosed on opioids at a workplace. NIOSH has developed a fact sheet<sup>30</sup> titled "Using Naloxone to Reverse Opioid Overdose in the Workplace," which can help employers and workers understand the risk of opioid overdose and provides guidance to help them decide if they should establish a workplace naloxone availability and use program.

### ***Illicit Drugs and Keeping First Responders Safe***

Naloxone is effective for reversing overdoses from opioids, including the powerful synthetic drug fentanyl.

Fentanyl (including illicitly manufactured fentanyl), similar to morphine, is a synthetic opioid, and it can be up to 100 times more potent and potentially more fatal than morphine and heroin due to its suppression of the central nervous system and respiratory function.<sup>9,31</sup> NIOSH identified emergency responders<sup>32</sup> and healthcare workers,<sup>33</sup> as well as other personnel in hospital and clinic settings, as at-risk groups for exposure. Guidance has been developed and tailored for these groups and contains standard operating procedures, training, personal protective equipment, and other relevant information for preventing occupational exposure to fentanyl and its analogs. An additional illicit drug toolkit<sup>34</sup> has been developed to provide accessible resources, including infographics and postcards, to help first responders protect themselves from illicit drug exposure. NIOSH also conducts Health Hazard Evaluations (HHEs),<sup>35</sup> which serve as field investigations to help employees, unions, and employers (at no cost) learn whether health hazards are present at their workplace and recommend ways to reduce hazards and prevent work-related illness. Several HHEs have assessed occupational exposures to illicit drugs among first responders and emergency personnel.

### ***Medication-Assisted Treatment and Return to Work***

For workers struggling with opioid misuse or opioid use disorder, medication-assisted treatment (MAT), also known as medication-based treatment (MBT) or medications for opioid use disorder (MOUD), can be an integral part of treatment and recovery. Definitive treatment is an essential part of the long-term solution to SUD, and MAT is the gold standard. Employment and return to work (RTW) strategies are critical, and MAT contributes to more stable, long-term employability. NIOSH has developed a Workplace Solutions document<sup>36</sup> which provides information for employers wishing to assist or support workers with OUD, describes current treatments, and provides a multi-step set of information on creating a workplace atmosphere that focuses on prevention, opioid misuse minimization, decreasing stigma, and supporting people with SUD through treatment and back to work.

### ***Workplace Supported Recovery***

The Biden-Harris Administration's Statement of Drug Policy Priorities for Year One<sup>37</sup> encourages the development and adoption of peer recovery support services and recovery-ready workplace models. NIOSH has developed an initiative called *Workplace Supported Recovery*<sup>38</sup> to describe and support workplace efforts to prevent substance misuse, address SUDs, and support worker recovery and well-being. In a *Workplace Supported Recovery* (WSR) program, employers use

evidence-based policies and programs to help prevent initial substance use, decrease the risk for substance misuse and its progression to an SUD, help workers who are struggling seek the care they need, and provide assistance in recovery. This is consistent with the broad perspective of the NIOSH *Total Worker Health*<sup>®</sup> Program,<sup>29</sup> promoting a culture of ongoing support for any issues that workers may face, whether on the job or away from work. Comprehensive *Workplace Supported Recovery* programs applying the *Total Worker Health*<sup>®</sup> approach focus on:

- preventing work-related injuries and illnesses that could lead to the initiation of substance misuse and decreasing difficult working conditions or work demands that might lead to daily or recurrent pain;
- promoting the use of alternatives to opioids for pain relief associated with a workplace injury or illness with the goal of preventing the initiation of substance misuse;
- providing information and access to care for an SUD when it is needed, including access to medication-based or medication-assisted treatment together with individual counseling;
- developing return-to-work plans and supporting second chance employment;
- providing workplace accommodations and other return to work assistance; and
- providing peer support and peer coaching to bolster the social supports available to workers in recovery.

Employment itself is a crucial component for recovery. Being employed provides workers with critical sources of recovery capital that can motivate and maintain a desire for treatment and recovery, including but not limited to: economic stability, a meaningful social role, and often direct access to treatment and recovery services. The aim of a recovery-supportive employer is to preserve employment for those with an SUD and provide second-chance employment for recovering individuals. It will be critical to keep this all under consideration in light of the job loss and increase in drug use<sup>39</sup> that has been seen during the COVID-19 pandemic.

An ideal recovery-supportive workplace understands the nature of SUDs and recovery, as well as the factors that support the initiation of treatment and maintenance of recovery, with the intent of reducing stigma at work. It encourages employees to seek treatment and initiate recovery early in their disorder and provides access to evidence-based supportive resources for treatment and recovery. On the *Workplace Supported Recovery* webpage, NIOSH outlines specific considerations and activities for workplaces aiming to support workers with SUDs, with a particular emphasis on the importance of stigma reduction. Individuals with a SUD, as well

as those in recovery, may experience extreme levels of stigmatization. This can lead to prejudice, discrimination, social exclusion, and limited opportunities to participate fully in employment and other life roles. Visible and accessible educational materials, as well as consistent discussions of the actual nature of SUDs, treatment, and recovery, may help reduce stigma and encourage entry into treatment and recovery. Materials and discussions should emphasize that an SUD is an illness, not a moral failing, and recovery *is* possible. Workplaces can engage in the following activities to help reduce stigma in the workplace and create a safe atmosphere to encourage conversation around substance misuse, treatment, and recovery:

- provide training to managers and workers to overcome misunderstanding and bias against individuals with an SUD;
- adopt health-promoting policies in the workplace to raise awareness and support workers and their family members struggling with an SUD;
- eliminate imprecise and pejorative terms from workplace language and instead adopt language that reflects a health perspective and is consistent with terms used to describe other health conditions (e.g., “person with SUD”); and
- ensure that all substance use policies are informed by science and supported by data.

*Workplace Supported Recovery* programs are not a one-size-fits-all approach to supporting workers in treatment and/or recovery from a SUD. Risk analysis is a critical piece of evaluating job roles in the context of any health challenges faced by the worker occupying the role. Workers along the arc of recovery may require customized approaches to employment and *Workplace Supported Recovery*, particularly those with safety-sensitive jobs. Qualified occupational healthcare providers can help make case-by-case determinations about specific and necessary restrictions or job limits, and reasonable accommodations should be considered and implemented by the employer when appropriate.

The basic tenets of *Workplace Supported Recovery*—education, support, provision of resources, stigma reduction—can be applied to other occupational safety and health concerns, such as supporting worker mental health. As we move forward in the midst of the COVID-19 pandemic, particularly with evolving work arrangements, increasing occupational stress, and a blurring of the lines between home and work environments, *Workplace Supported Recovery* resources will be tailored to meet employers and workers where they’re at. NIOSH also acknowledges the need for and will pursue additional ongoing research surrounding work, impairment, and treatment for workers along the arc of recovery.



## Conclusion: Prevention Is Critical, Recovery Is Possible

Certain aspects of work, like work injury or working conditions that lead to stress or pain, may predispose a worker to initiate use of opioids, and a small number may misuse opioids or develop an OUD. Yet the workplace can also represent a critical point of support and a source of recovery capital for workers seeking treatment and pursuing sustained recovery. Like any other chronic disease, OUD is treatable and manageable, and recovery is possible. Employers and workplaces have a unique opportunity to combat the opioid crisis by focusing on prevention, actively reducing stigma, providing information and resources, and lowering the barriers for employees seeking care and support.


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## References

1. Hedegaard H, Miniño AM and Warner M. *Drug overdose deaths in the United States, 1999–2019. NCHS data brief, no 394*. Hyattsville, MD: National Center for Health Statistics, 2020. [www.cdc.gov/nchs/data/databriefs/db394-H.pdf](https://www.cdc.gov/nchs/data/databriefs/db394-H.pdf)
2. Mattson CL, Tanz LJ, Quinn K, et al. Trends and geographic patterns in drug and synthetic opioid overdose deaths—United States, 2013–2019. *MMWR Morb Mortal Wkly Rep* 2021; 70: 202–207.
3. Substance Abuse and Mental Health Services Administration. Public online data analysis system (PDAS). National Survey on Drug Use and Health: Concatenated Public Use File (2002 to 2019), [https://pdas.samhsa.gov/#/survey/NSDUH-2002-2019-DS0001/crosstab/?results\\_received=true](https://pdas.samhsa.gov/#/survey/NSDUH-2002-2019-DS0001/crosstab/?results_received=true) (accessed 10 August 2021).
4. Center for Behavioral Health Statistics and Quality. *Results from the 2019 national survey on drug use and health: detailed tables*. Rockville, MD: SAMHSA, 2019. [www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSec1pe2019.htm](https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSec1pe2019.htm)
5. U.S. Department of Labor, Bureau of Labor Statistics. *News release: national census of fatal occupational injuries in 2019. USDL-20-2265*. Washington, DC: U.S. Department of Labor, Bureau of Labor Statistics, 16 December 2020. [www.bls.gov/news.release/pdf/cfoi.pdf](https://www.bls.gov/news.release/pdf/cfoi.pdf)
6. Morano LH, Steege AL and Luckhaupt SE. Occupational patterns in unintentional and undetermined drug-involved and opioid-involved overdose deaths—United States, 2007–2012. *MMWR Morb Mortal Wkly Rep* 2018; 67: 925–930.
7. Kowalski-McGraw M, Green-McKenzie J, Pandalai SP, et al. Characterizing the interrelationships of prescription opioid and benzodiazepine drugs with worker health and workplace hazards. *J Occup Environ Med* 2017; 59: 1114–1126.
8. Choi B. Opioid use disorder, job strain, and high physical job demands in US workers. *Int Arch Occup Environ Health* 2020; 93: 577–588.
9. Drug Enforcement Administration. *2017 national drug threat assessment summary*. Washington, DC: US Department of Justice, Drug Enforcement Administration, 2017. [www.dea.gov/sites/default/files/2018-07/DIR-040-17\\_2017-NDTA.pdf](https://www.dea.gov/sites/default/files/2018-07/DIR-040-17_2017-NDTA.pdf)
10. Osborne J, Chosewood C and Howard J. The COVID-19 pandemic and the opioid overdose epidemic: a perfect storm for workers? <https://blogs.cdc.gov/niosh-science-blog/2020/09/14/covid-19-and-oud/> (14 September 2020, accessed 10 August 2021).
11. American Medical Association. Issue brief: reports of increases in opioid- and other drug-related overdose and other concerns during COVID pandemic, [www.ama-assn.org/system/files/2020-12/issue-brief-increases-in-opioid-related-overdose.pdf](https://www.ama-assn.org/system/files/2020-12/issue-brief-increases-in-opioid-related-overdose.pdf) (accessed 10 August 2021).
12. Kuhl E. SAMHSA disaster helpline sees increase in COVID-19 related outreach. *Psychiatric News*. <https://psychnews.psychiatryonline.org/doi/10.1176/appi.pn.2020.5b29>
13. Davis CS and Samuels EA. Opioid policy changes during the COVID-19 pandemic—and beyond. *J Addict Med* 2020; 14: e4–5. DOI: 10.1097/ADM.0000000000000679.
14. D’Onofrio G, Venkatesh A and Hawk K. The adverse impact of Covid-19 on individuals with OUD highlights the urgent need for reform to leverage emergency department-based treatment. *N Engl J Med Catal* 2020; 10: 1056. DOI: 10.1056/CAT.20.0190. <https://catalyst.nejm.org/doi/full/10.1056/CAT.20.0190>
15. Jenkins WD, Bolinski R, Bresett J, et al. COVID-19 during the opioid epidemic—exacerbation of stigma and vulnerabilities. *J Rural Health* 2020; 37: 172–174.
16. National Institute on Drug Abuse. COVID-19 and substance use disorder, [www.drugabuse.gov/drug-topics/comorbidity/covid-19-substance-use](https://www.drugabuse.gov/drug-topics/comorbidity/covid-19-substance-use) (accessed 10 August 2021).
17. Centers for Disease Control and Prevention. People with certain medical conditions, [www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html](https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html) (accessed 10 August 2021).
18. Khatri UG and Perrone J. Opioid use disorder and COVID-19: crashing of the crises [published online ahead of print, 2020 May 12]. *J Addict Med* 2020; 14: e6–e7.
19. Mukherjee TI and El-Bassel N. The perfect storm: COVID-19, mass incarceration and the opioid epidemic. *Int J Drug Policy* 2020; 83: 102819.

20. Sun Y, Bao Y, Kosten T, et al. Editorial: challenges to opioid use disorders during COVID-19. *Am J Addict* 2020; 29: 174–175. doi:10.1111/ajad.13031
21. Silva MJ and Kelly Z. The escalation of the opioid epidemic due to COVID-19 and resulting lessons about treatment alternatives. *Am J Manag Care* 2020; 26: e202–e204.
22. Henry BF, Mandavia AD, Paschen-Wolff MM, et al. COVID-19, mental health, and opioid use disorder: old and new public health crises intertwine. *Psychol Trauma* 2020; 12: S111–S112.
23. Granfield R and Cloud W. *Coming clean: overcoming addiction without treatment*. New York: New York University Press, 1999.
24. Cloud W and Granfield R. A life course perspective on exiting addiction: the relevance of recovery capital in treatment. *NAD Publication (Nordic Council for Alcohol and Drug Research)* 2004; 44: 185–202.
25. National Safety Council. National employer survey 2019: opioid usage in the workplace, [www.nsc.org/getmedia/d7221a2a-a6a5-4348-a092-02ed41e9d251/ppw-survey-methodology.pdf](http://www.nsc.org/getmedia/d7221a2a-a6a5-4348-a092-02ed41e9d251/ppw-survey-methodology.pdf) (2019, accessed 10 August 2021).
26. National Safety Council. New analysis: employers can save average of \$8,500 for supporting each employee in recovery from substance use disorder, [www.nsc.org/newsroom/new-analysis-employers-stand-to-save-an-average-of](http://www.nsc.org/newsroom/new-analysis-employers-stand-to-save-an-average-of) (2 December 2020, accessed 10 August 2021).
27. National Institute for Occupational Safety and Health. About NIOSH, [www.cdc.gov/niosh/about/default.html](http://www.cdc.gov/niosh/about/default.html) (28 March 2018, accessed 10 August 2021).
28. National Institute for Occupational Safety and Health. Opioids in the workplace: NIOSH confronts the opioid crisis, [www.cdc.gov/niosh/topics/opioids/framework.html](http://www.cdc.gov/niosh/topics/opioids/framework.html) (15 June 2018, accessed 10 August 2021).
29. National Institute for Occupational Safety and Health. NIOSH Total Worker Health® Program, [www.cdc.gov/niosh/twh/default.html](http://www.cdc.gov/niosh/twh/default.html) (28 July 2020, accessed 10 August 2021).
30. National Institute for Occupational Safety and Health. Using naloxone to reverse opioid overdose in the workplace: information for employers and workers, [www.cdc.gov/niosh/docs/2019-101/default.html](http://www.cdc.gov/niosh/docs/2019-101/default.html) (5 October 2018, accessed 10 August 2021).
31. National Institute for Occupational Safety and Health. Fentanyl: overview, [www.cdc.gov/niosh/topics/fentanyl/default.html](http://www.cdc.gov/niosh/topics/fentanyl/default.html) (15 November 2016, accessed 10 August 2021).
32. National Institute for Occupational Safety and Health. Fentanyl: preventing emergency responders' exposures to illicit drugs, [www.cdc.gov/niosh/topics/fentanyl/risk.html](http://www.cdc.gov/niosh/topics/fentanyl/risk.html) (11 February 2020, accessed 10 August 2021).
33. National Institute for Occupational Safety and Health. Fentanyl: preventing occupational exposure to healthcare personnel in hospital and clinic settings, [www.cdc.gov/niosh/topics/fentanyl/healthcareprevention.html](http://www.cdc.gov/niosh/topics/fentanyl/healthcareprevention.html) (23 April 2018, accessed 10 August 2021).
34. National Institute for Occupational Safety and Health. Fentanyl: illicit drug tool-kit for first responders, [www.cdc.gov/niosh/topics/fentanyl/toolkit.html](http://www.cdc.gov/niosh/topics/fentanyl/toolkit.html) (5 April 2019, accessed 10 August 2021).
35. National Institute for Occupational Safety and Health. Health hazard evaluations (HHEs), [www.cdc.gov/niosh/hhe/default.html](http://www.cdc.gov/niosh/hhe/default.html) (30 September 2019, accessed 10 August 2021).
36. Howard J, Ciminieri L, Evans T, et al. *Medication-assisted treatment for opioid use disorder*. Washington, DC: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No. 2019-133, 2019. <https://doi.org/10.26616/NIOSH-PUB2019133>
37. Office of National Drug Control Policy, Executive Office of the President. The Biden-Harris administration's statement of drug policy priorities for year one, [www.whitehouse.gov/wp-content/uploads/2021/03/BidenHarris-Statement-of-Drug-Policy-Priorities-April-1.pdf](http://www.whitehouse.gov/wp-content/uploads/2021/03/BidenHarris-Statement-of-Drug-Policy-Priorities-April-1.pdf) (accessed 10 August 2021).
38. National Institute for Occupational Safety and Health. Workplace supported recovery, [www.cdc.gov/niosh/topics/opioids/wsrp/default.html](http://www.cdc.gov/niosh/topics/opioids/wsrp/default.html) (27 July 2020, accessed 10 August 2021).
39. Alexander GC, Stoller KB, Haffajee RL, et al. An epidemic in the midst of a pandemic: opioid use disorder and COVID-19. *Ann Intern Med* 2020; 173: 57–58.

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