Only 5% of Overdose Patients Tested for Fentanyl, #1 Killer of Americans 18-45

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Key Findings:

- Since 2017, patients visiting the emergency department for an overdose have been tested for opiates in 45-50% of cases, and the positivity rate of these tests has gradually decreased to less than 14%. However, opiate screenings do not detect fentanyl.
- While testing for fentanyl during overdose visits has become more common in recent quarters, the testing rate remains low at 5%, despite more than 56,000 overdose deaths involving synthetic opioids, like fentanyl, in 2020.[1] When testing occurs, positivity rates for fentanyl are approaching 50%, more than three times the positivity rate of opiates.
- Identification of fentanyl during overdose visits is important to appropriately identify treatment needs and inform public health interventions for illicit drug use, which can save additional lives.

When a patient comes to the emergency department for a drug overdose or poisoning, toxicology testing panels are used to identify which drugs are in a patient's system. These tests can inform treatment and track public health trends related to illicit drug use. Common substances typically included in routine toxicology screens are amphetamines, barbiturates, benzodiazepines, cocaine, cannabis, phencyclidine, and opiates, such as morphine. However, in recent years, there has been an 18-fold increase in overdose deaths related to synthetic opioids, like fentanyl, which is 100 times stronger than morphine.[1] Because fentanyl is a synthetic opioid, it is not usually detected in routine toxicology screenings and typically must be ordered separately.[2,3]

We sought to better understand how often toxicology screenings are performed during overdose and poisoning ED visits and which drugs are included in those screenings. We looked at lab test results for 15 drug categories from 2017 to present day and found that opiates are consistently tested nearly half the time, with 152,845 tests done during 315,467 overdose visits. In addition, the positivity rate has decreased dramatically from 25.2% in 2018 to 13.5% in 2022. The declining trend of opiate positives, as shown in Figure 1, may reflect a transition in drug composition from heroin to fentanyl.

Opiate Testing in the ED

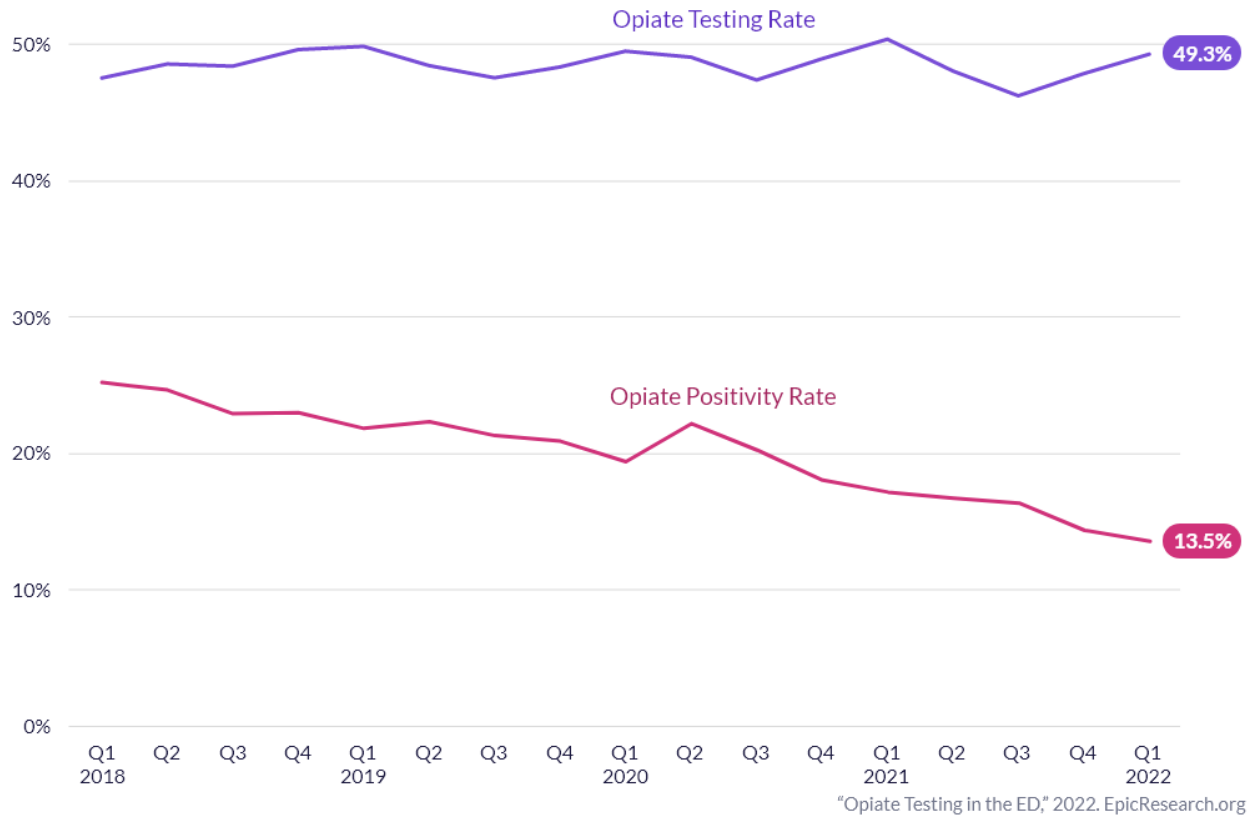

Figure 1. Testing and positivity rates for opiates in ED overdose encounters. The testing rate for opiates has remained steady while the positivity rate has decreased. Testing rates in 2017 followed a similar trend.

We have seen an increase in fentanyl testing in the past five years, but the drug is still only tested for in 5.1% of overdose ED visits, much less frequently than opiates. This is likely due to the exclusion of fentanyl testing in routine ED toxicology screening panels. As of the first quarter of 2022, the positivity rate of fentanyl is more than three times greater than opiates: 41.7% compared to 13.5%.

Fentanyl Testing in the ED

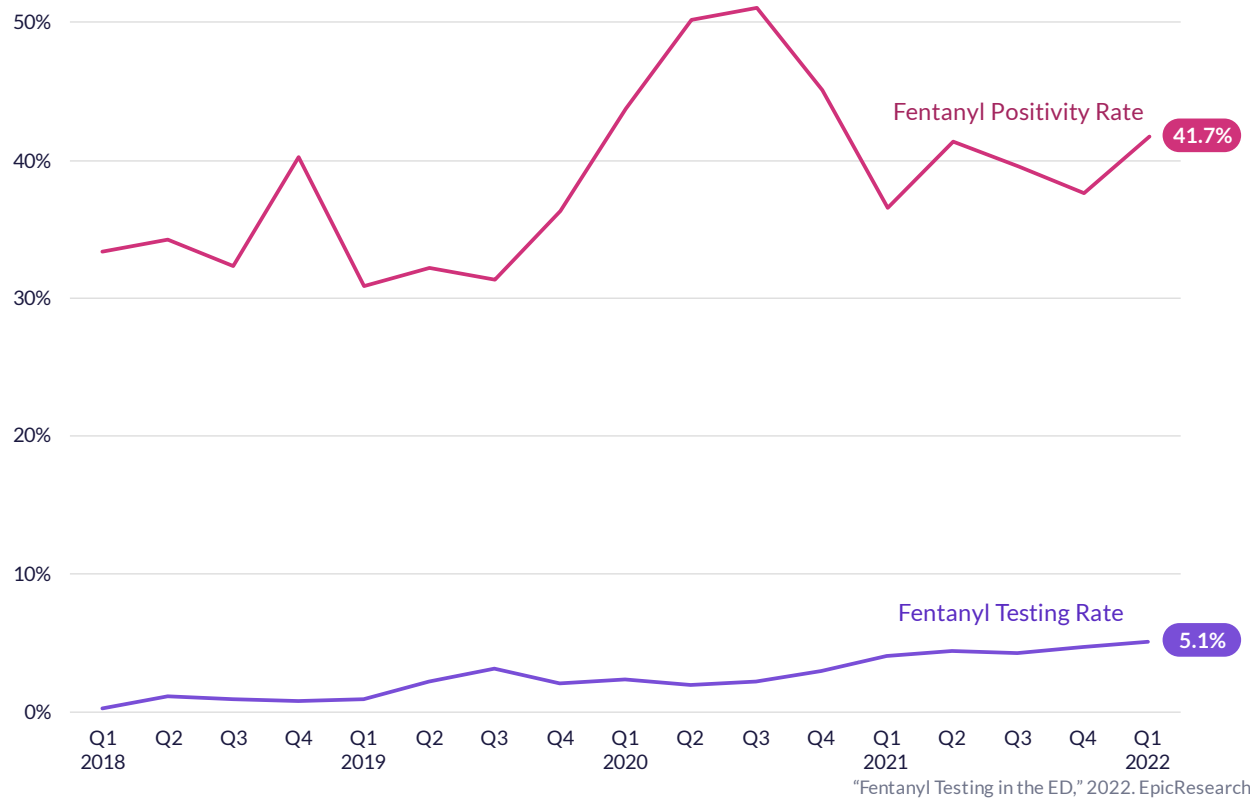

Figure 2. Testing and positivity rates for fentanyl, a synthetic opioid, in ED overdose encounters. Fentanyl is rarely tested in ED overdose visits, but when it is, the positivity rate is over 40 percent. Testing rates in 2017 showed fentanyl test volume was negligible that year.

To improve tracking of drug use trends, increase identification of fentanyl use, and better support targeted drug-related treatment, emergency departments should review standard drug testing panels and consider including fentanyl testing in toxicology screening.

These data come from Cosmos, a HIPAA-defined Limited Data Set of more than 149 million patients from 172 Epic organizations including 1,041 hospitals and more than 21,000 clinics, serving patients in all 50 states. This study was completed as a collaboration between Epic Research and the Center for Substance Abuse Research (CESAR) at the University of Maryland, College Park.

References

1. Centers for Disease Control and Prevention. Fentanyl. https://www.cdc.gov/opioids/basics/fentanyl.html. Accessed August 1, 2022.
2. Dezman, Z., Schwartz, B., Billing, A., Massey, E., Artigiani, E., Factor, J., and Wish, E. (2020). Notes from the Field: High Prevalence of Fentanyl Detected by the Maryland Emergency Department Drug Surveillance System – Baltimore, Maryland, 2019. MMWR Morb Mortal Wkly Rep 2020;69:724-726. DOI: http://dx.doi.org/10.15585/mmwr.mm6923a3
3. Dezman, Z., Lemkin, D., Tracy, K., Wish, E., Billing, A., Factor, J., Massey, E., and Artigiani, E. (2019). A Pilot Study Using Electronic Health Records from Hospital Emergency Departments to Monitor Drug Use Trends in Overdose Patients in the Baltimore Area, January 2016-December 2018. University of Maryland Medical System. https://cesar.umd.edu/sites/cesar.umd.edu/files/pubs/EDDS-EHR-MD-Baltimore-Report-2016-2018.pdf

Data Definitions

Term	Definition
Emergency Encounter	An emergency department visit started between January 1, 2017, and March 31, 2022, within an organization using Epic's clinical emergency department, billing, and lab applications on the encounter date.
Overdose Emergency Encounter	An Emergency Encounter with an encounter or billing diagnosis mapped to one of the following ICD-10-CM code patterns: [1] T36.9*, T37.9*, T39.9*, T41.4*, T42.7*, T43.9*, T45.9*, T47.9*, or T49.9* with the second digit following the decimal place of 1, 2, or 4 [2] T36*, T37*, T38*, T39*, T40*, T41*, T42*, T43*, T44*, T45*, T46*, T47*, T48*, T49*, or T50* with a third and fourth digits after the decimal place of 1A, 2A, or 4A
Amphetamines	Lab components mapped to LOINC code 19343-3, 3349-8, 19261-7, 14308-1, 40419-4, 43983-6, 76492-8, 19344-1, 16369-1, 19268-2, 8149-7, 19262-5, 3348-0, 51690-6, 8146-3, 40799-9, 29530-3, 8155-4, 8145-5, 8144-8, 8148-9, 8156-2, 74680-0, 75644-5, 66127-2, 40420-2, 40421-0, or 74681-8
Barbiturates	Lab components mapped to LOINC code 19270-8, 3377-9, 70155-7, 70139-1, 16429-3, 3376-1, 19271-6, 20421-4, 72627-3, 21091-4, 34578-5, 40412-9, 12358-8, 61067-5, 19278-1, 10363-0, 61096-4, or 19277-3
Benzodiazepines	Lab components mapped to LOINC code 14316-4, 3390-2, 70141-7, 70142-5, 42235-2, 16195-0, 42662-7, 3389-4, 19279-9, 46976-7, 43828-3, 72633-1, 31081-3, 72456-7, 38441-2, 40414-5, or 90890-5

Buprenorphine	Lab components mapped to LOINC code 3414-0, 58359-1, 82371-6, 93494-3, 58362-5, 16208-1, 38373-7, 89305-7, 73942-5, 77205-3, 82375-7, 79139-2, 82373-2, 79138-4, 69033-9, or 66131-4
Cannabinoids	Lab components mapped to LOINC code 18282-4, 3427-2, 14312-3, 70145-8, 3426-4, 19415-9, 21557-4, 3435-5, 21556-6, 70144-1, 19416-7, 19381-3, 19289-8, 19382-1, 67126-3, 78754-9, 8175-2, 3425-6, 8172-9, 19287-2, 19293-0, 72461-7, 42492-9, 48943-5, 40801-3, 42491-1, 8167-9, 8171-1, 31080-5, 72379-1, 8169-5, 61063-4, 49746-1, 72478-1, 57924-3, 8179-4, 74157-9, 74678-4, 88023-7, 42630-4, 88022-9, 87495-8, 87492-5, 87484-2, 73914-4, 73918-5, 72474-0, 87487-5, 87486-7, 72471-6, 87494-1, 87493-3, 87491-7, 87485-9, 87490-9, 87489-1, 87488-3, 8178-6, 26743-5, 72460-9, 73917-7, 72470-8, 43834-1, 72472-4, 73952-4, 73925-0, 73943-3, 19288-0, 73949-0, 73920-1, 73923-5, 73953-2, 73921-9, 73926-8, 73927-6, 73948-2, 73956-5, 73946-6, 73924-3, 73950-8, 73929-2, 73928-4, 73947-4, 73954-0, 73944-1, 73919-3, 73951-6, 73930-0, 73922-7, 73945-8, 73955-7, or 73957-3
Cocaine	Lab components mapped to LOINC code 14314-9, 3397-7, 19359-9, 3393-6, 43985-1, 43984-4, 8192-7, 42241-0, 19360-7, 14315-6, 82723-8, 8190-1, 8191-9, 3391-0, 3395-1, 49747-9, 72407-0, 73823-7, 40802-1, 40625-6, 40609-0, 8187-7, 8189-3, 40527-4, 41037-3, 48947-6, 8197-6, 74671-9, 16446-7, 41036-5, 74679-2, or 74670-1
Fentanyl	Lab components mapped to LOINC code 59673-4, 11235-9, 58379-9, 66129-8, 40839-3, 43200-5, 43199-9, 74810-3, 61042-8, 29356-3, 87815-7, 67822-7, 73936-7, 66130-6, or 61052-7
Methylenedioxymethamphetamine (MDMA) / Methylenedioxyethylamphetamine (MDEA) / Methylenedioxyamphetamine (MDA)	Lab components mapped to LOINC code 19568-5, 73971-4, 14267-9, 59844-1, 42253-5, 19566-9, 19569-3, 19565-1, 40481-4, 61046-9, 61049-3, 61048-5, 87810-8, 91034-9, 75648-6, 61045-1, 61047-7, 40493-9, 74648-7, 74650-3, or 74653-7
Methadone	Lab components mapped to LOINC code 19550-3, 3773-9, 70149-0, 41858-2, 42251-9, 16199-2, 58428-4, 93495-0, 59705-4, 32093-7, 3771-3, 72626-5, 43595-8, 41860-8, 72400-5, 41859-0, 47411-4, 72386-6, 72387-4, or 45022-1
Methamphetamine	Lab components mapped to LOINC code 19554-5, 3779-6, 19555-2, 40419-4, 76492-8, 3777-0, 40381-6, 91034-9, 40804-7, 75644-5, 29286-2, 40420-2, 40421-0, or 74646-1

Opiates (for example, morphine or codeine)	Lab components mapped to LOINC code 19295-5, 3879-4, 70151-6, 21431-2, 18390-5, 19296-3, 8219-8, 3878-6, 51691-4, 34177-6, 40806-2, 8214-9, 8216-4, 8218-0, 8226-3, 5706-7, or 8215-6
Oxycodone	Lab components mapped to LOINC code 19642-8, 10998-3, 58430-0, 19643-6, 61424-8, 89303-2, 61197-0, 13576-4, 77732-6, 32101-8, 72402-1, 77731-8, 71430-3, 91053-9, 73996-1, 97290-1, or 69356-4
Oxymorphone	Lab components mapped to LOINC code 18325-1, 11247-4, 19646-9, 89301-6, 58430-0, 89302-4, 77732-6, 77731-8, 61197-0, 71430-3, 91053-9, 74659-4, 12342-2, 78874-5, or 97296-8
Phencyclidine	Lab components mapped to LOINC code 19659-2, 3936-2, 14310-7, 18392-1, 8236-2, 3935-4, 51692-2, 40808-8, 8232-1, 32107-5, 8234-7, 8233-9, 8242-0, 74660-2, 8235-4, or 58042-3
Tricyclic Antidepressants	Lab components mapped to LOINC code 19312-8, 11004-9, 6799-1, 19315-1, 78889-3, 4073-3, 19319-3, 80148-0, 19313-6, or 80146-4