

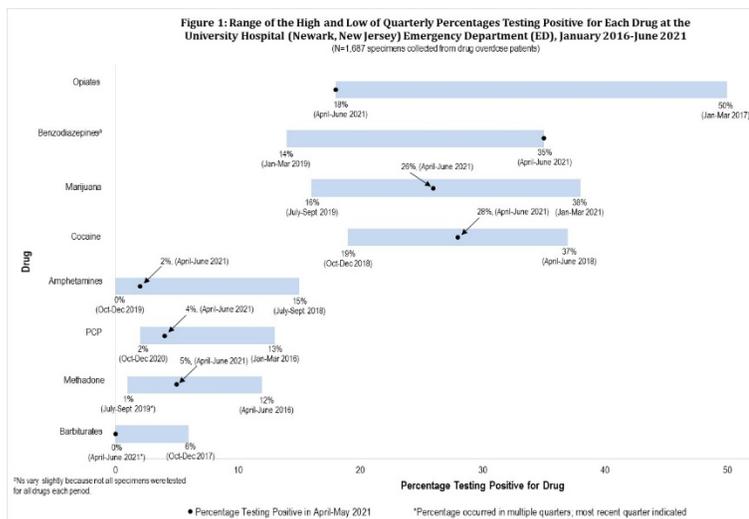
First Electronic Health Records from University Hospital (Newark, NJ) for January 2016-June 2021 Reveal that Benzodiazepines are at Six-Year High and Opiates are at Six-Year Low, but EDDS Expanded Re-testing Detects Fentanyl

Method

University Hospital, located in Newark, NJ, submitted electronic health records (EHRs) containing urinalysis results for 1,687 specimens tested between January 2016 and June 2021 that met the study eligibility criteria. The EDDS EHR results apply only to the subset of patients presenting to the emergency department (ED) with a drug-related complaint who received urine drug tests. The hospital screens specimens for eight drugs: amphetamines, barbiturates, benzodiazepines, cannabinoids, cocaine, methadone, opiates, and PCP. De-identified EHRs were obtained for patients 18 years or older presenting to the ED with 1) an ICD-10-CM T36-T50 diagnosis code (any intent or encounter type) AND a complaint of "drug overdose"; or 2) an ICD-10-CM T36-T50 initial encounter diagnosis code of poisoning with accidental (unintentional), intentional self-harm, or undetermined intent that had urine drug test results available. See the EDDS website for additional information about EDDS methods.

EHR Quarterly Results¹

Figure 1 shows that benzodiazepine positives reached their highest (35%) level in six years in April-June 2021. Opiates,



amphetamines, PCP and barbiturates were at/near the bottom of their six-year ranges. Opiate positives peaked at 50% in January-March 2017 and reached their lowest level (18%) in the most recent quarter. Benzodiazepines have been increasing since their low of 14% reached in January-March 2019. Amphetamines, barbiturates, methadone, and PCP were the least detected drugs.

Combined analyses of submitted results from all patients in January 2016-June 2021 showed that patients testing positive for barbiturates, opiates, and cocaine were oldest (median ages of 52.5, 52, and 50, respectively), while patients testing positive for PCP (37), amphetamines (34.5), and marijuana (34) were the youngest. Specimens positive for methadone contained the greatest total number of drugs (mean=2.69). Opiates were detected in 68% of cocaine-positive specimens, 50% of benzodiazepine-positive specimens, and 50% of methadone-positive specimens. Opiate positive specimens were most likely to contain cocaine (49%), benzodiazepines (33%), or marijuana (19%).

EDDS Expanded Re-testing Results

The EDDS laboratory received from the hospital 102 specimens that had tested positive for any drug in their 8-drug screen excluding ethanol (hospital positives), and 51 specimens that had tested negative for all drugs including ethanol (hospital negatives). EDDS re-tested them for approximately 500 drugs. The specimens were sampled from consecutive patients seen in April and May, 2021.* Notable results from the expanded re-testing include:

- Fentanyl, a drug not included in the hospital's screen, was detected in 28% of the hospital positive specimens and in 10% of the hospital negative specimens.
- Non-fentanyl opioids were detected in 38% of the hospital positive specimens and 14% of the hospital negative specimens.
- Marijuana and benzodiazepines were each detected in more than half of the hospital positive specimens.
- Other drugs detected in the hospital negative specimens included lorazepam, diphenhydramine, and gabapentin, drugs which might have been taken under medical supervision.**

*These specimens were not selected according to the eligibility criteria for selecting the EHRs and represent a smaller time period. These results are therefore not directly comparable to those from the hospital's EHRs.

**The EDDS cutoff levels were more sensitive than those used by the hospital's laboratory and may have contributed to EDDS detecting more drugs.

¹All tables and figures are available online at: <https://cesar.umd.edu/landingtopic/edds-hospitals-data>

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Implications

In recent years, there has been an increase in the adulteration of the heroin supply with synthetic drugs such as fentanyl, xylazine, or other sedative-hypnotics. The urine drug screen used at University Hospital detects opiates, which is sensitive to morphine (the primary metabolite of heroin) and codeine, but may have some cross-reactivity with hydrocodone and/or hydromorphone. Fentanyl is not detected by the opiate assay. From January to March 2017, there was a peak (50%) in opiate positive results, with a steady decline since then. This decline is likely due to the fact that the hospital screen does not detect fentanyl, a common finding in other EDDS studies.² EDDS expanded testing detected fentanyl in specimens that screened both positive (28%) and negative (10%) for drugs by the hospital laboratory. The hospital is currently working to add fentanyl to their routine test screen. It is not possible to determine from the EDDS results whether the presence of benzodiazepines or any prescribed drugs were due to illicit use, unintentional exposure, or administration by a physician.

EDDS Overview

EDDS provides the nation with a new tool to display near real-time trends in a hospital's urine drug test results and to discover emerging drugs that may not be included in a hospital's routine urinalysis screens. This information is vital to ensuring that hospitals and localities are better prepared to understand the local drug problems they and their patients face. EDDS obtains quarterly exports of de-identified test results from emergency department patients' electronic health records (EHRs) and annually re-tests 150 de-identified urine specimens for almost 500 drugs. This model was pilot tested in seven Maryland hospitals and is now being launched in other states. An *EDDS Bulletin* will be published to announce the release of each hospital's detailed findings.

Go here for all EDDS publications and current data: <https://cesar.umd.edu/landing/EDDS>.

²Dezman, Z., Schwartz, B., Billing, A., Massey, E., Artigiani, E. 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*, 69(23): 734-726. DOI: <http://dx.doi.org/10.15585/mmwr.mm6923a3>