

Fentanyl Toxicology Testing Rates Increased Most for Adolescents and for Patients in Urban Areas Since 2021

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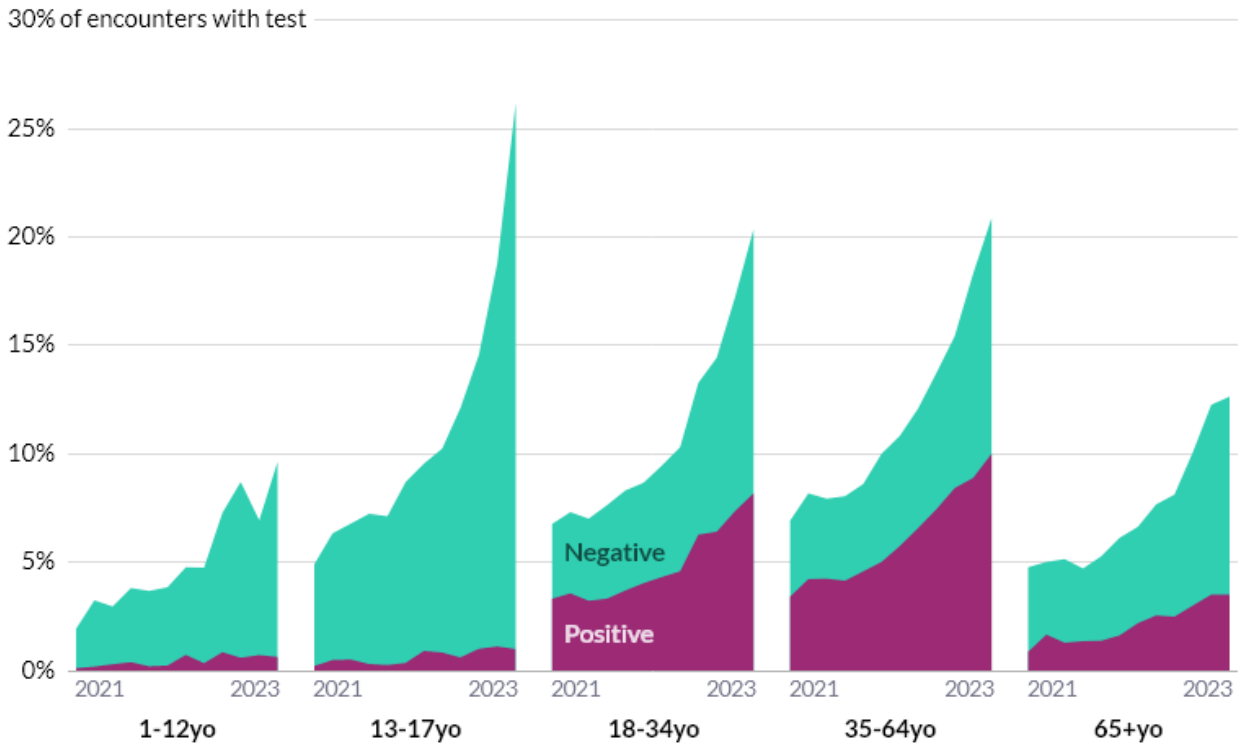
Key Findings:

- Fentanyl toxicology testing in overdose ED encounters has more than tripled for most age groups since 2021. Patients aged 13 to 17 experienced the greatest increase in testing rates, going from 5% of encounters to 26% of encounters.
- Fentanyl positivity rates have remained steady over the same period. Patients aged 35 to 64 had the highest fentanyl positivity rates, followed by those aged 18 to 34.
- Patients living in urban areas were twice as likely to be tested for fentanyl compared to those who live in rural areas, though positivity rates are similar between both groups.

We [previously published](#) a study showing that fentanyl toxicology testing rates were low and fentanyl positivity rates were high for ED overdose encounters.¹ Since that publication, California, Maryland, and Pennsylvania have enacted laws to require fentanyl testing in patients who have a urine drug screen performed in an acute hospital encounter.^{2,3,4} Additionally, our data tracker has demonstrated an increase in fentanyl testing over time for patients aged 18 and older.⁵ While we are encouraged by these improvements, we sought to further understand whether these changes have been similar across age groups and for patients who live in rural or urban areas.

We found that fentanyl testing rates in ED overdose encounters have risen across all age groups, tripling for most between Q1 2021 and Q4 2023, as seen in Figure 1. Patients aged 13 to 17 experienced the greatest increase in testing rates during this period, going from 5% of overdose encounters having a fentanyl screening to 26%. Patients aged 35 to 64 had the highest fentanyl positivity rate in all quarters, closely followed by those aged 18 to 34.

Fentanyl Testing Rates by Age Over Time

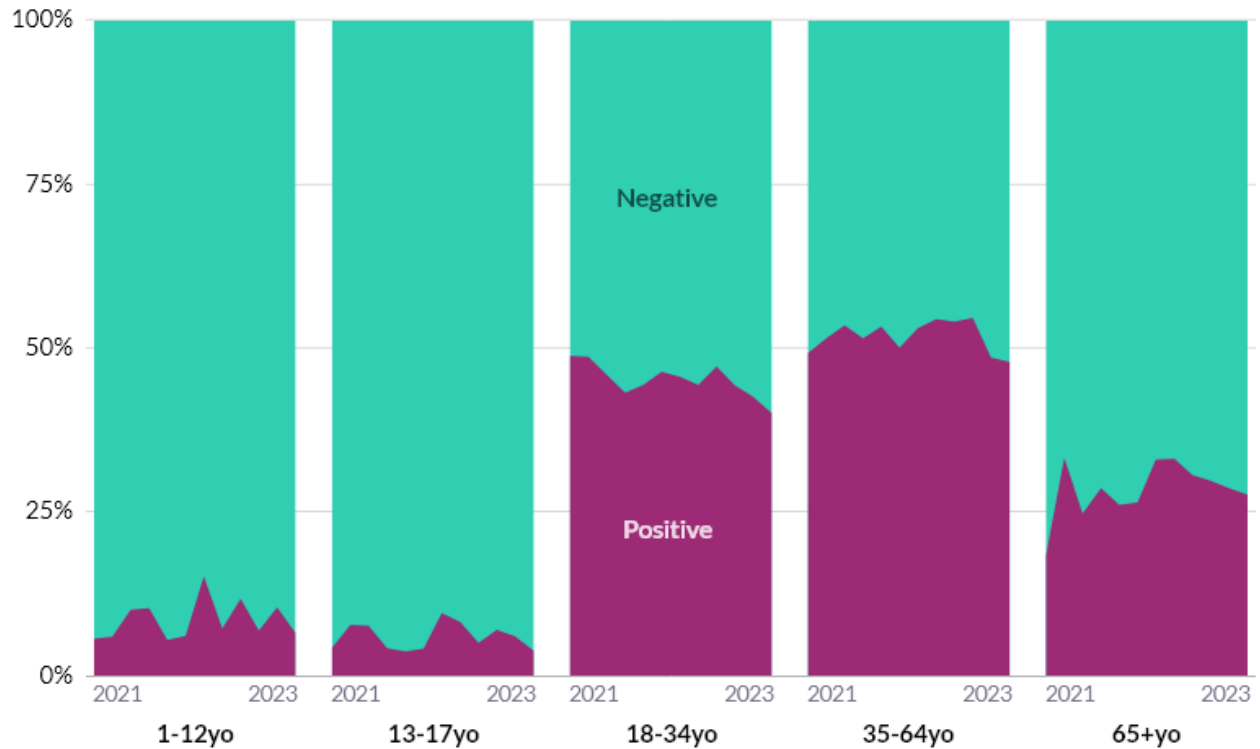


N=347,228 encounters

"Fentanyl Testing Rates by Age Over Time," 2024. EpicResearch.org

Figure 1a. Quarterly fentanyl toxicology testing rates by age over time.

Fentanyl Result Rates by Age Over Time



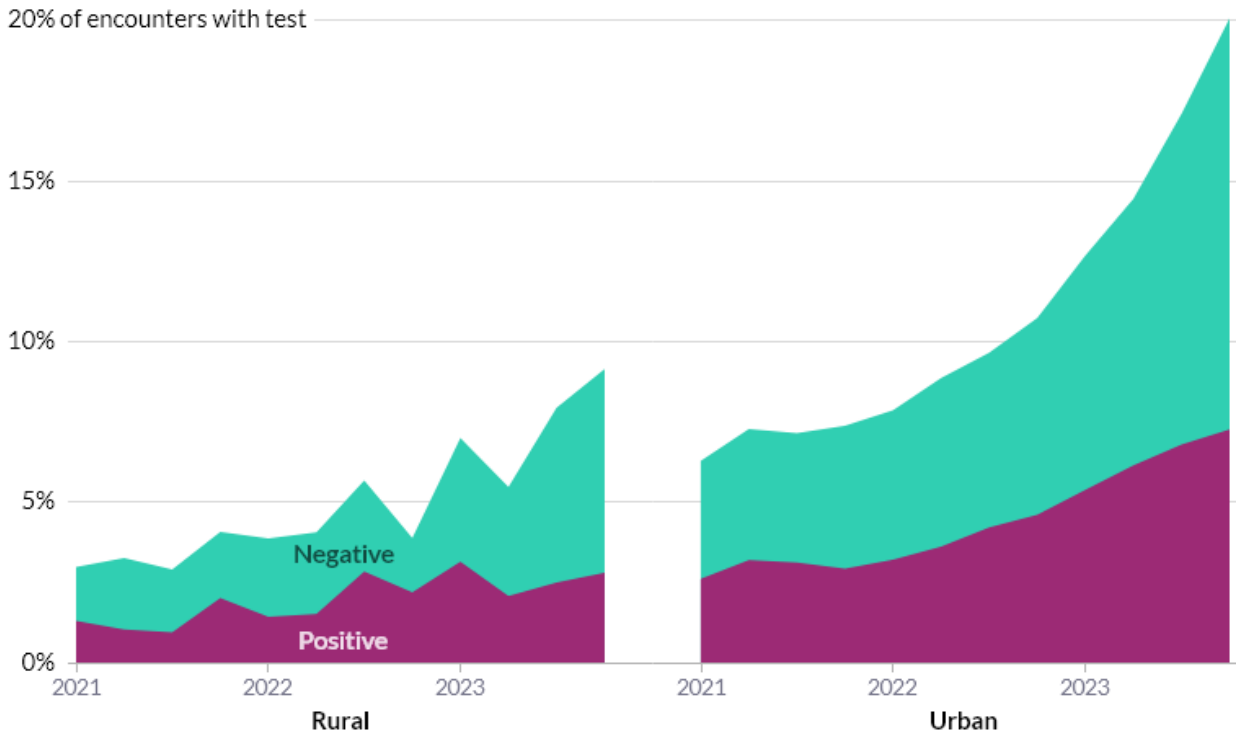
N=347,228 encounters

"Fentanyl Result Rates by Age Over Time," 2024. EpicResearch.org

Figure 1b. Quarterly fentanyl result rates by age over time.

We also evaluated fentanyl toxicology testing and positivity by the patient's rural-urban classification (RUCA). We found that fentanyl testing in urban areas occurred twice as often compared to rural areas in most quarters studied, with patients living in rural areas being tested for fentanyl in 9% of overdose encounters in Q4 2023 and patients living in urban areas being tested 20% of the time. However, the positivity rate for patients living in urban and rural areas has remained similar over the years.

Fentanyl Testing Rates by Rural-Urban Classification Over Time

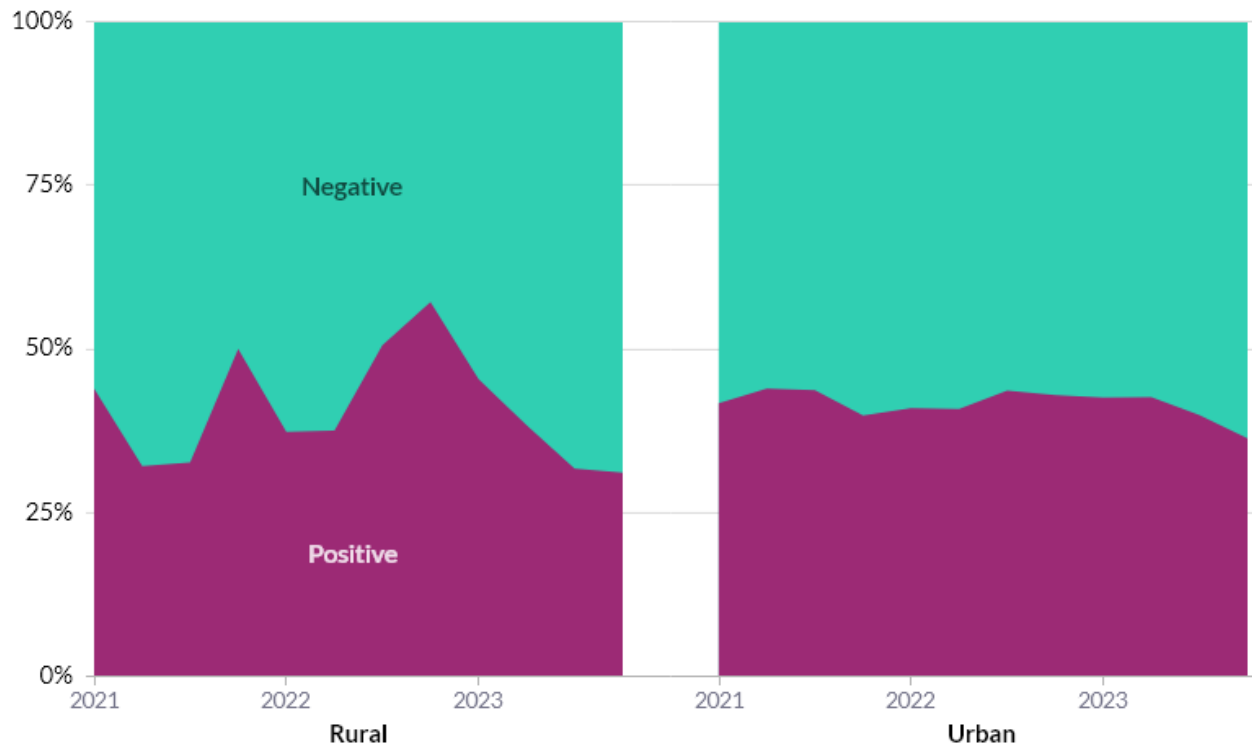


N=344,453 encounters

"Fentanyl Testing Rates by Rural-Urban Classification Over Time," 2024. EpicResearch.org

Figure 2a. Quarterly fentanyl testing rates by rural-urban classification over time.

Fentanyl Result Rates by Rural-Urban Classification Over Time



N=344,453 encounters

"Fentanyl Result Rates by Rural-Urban Classification Over Time," 2024. EpicResearch.org

Figure 2b. Quarterly fentanyl result rates by rural-urban classification over time.

Even with the increase in testing rates over recent years, positivity rates have remained fairly steady, indicating that the additional testing now is catching positive cases that could have been missed in the past.

These data come from Cosmos, a collaboration of Epic health systems representing more than 238 million patient records from 1,371 hospitals and more than 31,000 clinics from all 50 states and Lebanon. This study was completed by two teams that worked independently, each composed of a clinician and research scientists. The two teams came to similar conclusions. The two teams came to similar conclusions. Graphics by Brian Olson.

References

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2. Bill Text - SB-864 General acute care hospitals: drug screening. Legislature.ca.gov. https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220SB864.. Accessed February 5, 2024
3. Legislation - SB0914. Maryland.gov. <https://mgaleg.maryland.gov/mgaweb/Legislation/Details/sb0914?ys=2023RS>. Accessed February 5, 2024.

4. 2023 Act 43. Pennsylvania General Assembly.
<https://www.legis.state.pa.us/cfdocs/legis/li/uconsCheck.cfm?yr=2023&sessInd=0&act=43>. Accessed February 5, 2024.
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<https://www.epicresearch.org/data-tracker/fentanyl-and-opiate-toxicology>. Accessed March 6, 2024.

Data Definitions

Term	Definition
Study period	1/1/2021 – 12/1/2023
Study population	Encounters where a patient was diagnosed with an overdose in an emergency department setting.
Overdose	An encounter or billing diagnosis with ICD-10-CM code T36.9*, T37.9*, T39.9*, T41.4*, T42.7*, T43.9*, T45.9*, T47.9*, or T49.9* where the second digit following the decimal place is 1, 2, or 4; or T36*, T37*, T38*, T39*, T40*, T41*, T42*, T43*, T44*, T45*, T46*, T47*, T48*, T49*, or T50* where the third and fourth digits after the decimal place are 1A, 2A, or 4A.
Fentanyl testing	Lab components mapped to LOINC code 11235-9, 40839-3, 43199-9, 43200-5, 58379-9, 59673-4, 66129-8, 74810-3, or 95797-7.

Table 1: Fentanyl Testing and Positivity by Age

Age	Period	Encounters	Fentanyl		
			Tested	Positive	Tested*Pos
[1-13)	2021-Q1	1,934	1.9%	5.6%	0.1%
	2021-Q2	2,104	3.2%	5.9%	0.2%
	2021-Q3	2,034	2.9%	10.0%	0.3%
	2021-Q4	2,055	3.8%	10.3%	0.4%
	2022-Q1	2,012	3.7%	5.4%	0.2%
	2022-Q2	2,165	3.8%	6.0%	0.2%
	2022-Q3	2,100	4.8%	15.2%	0.7%
	2022-Q4	2,064	4.7%	7.1%	0.3%
	2023-Q1	2,122	7.3%	11.7%	0.8%
	2023-Q2	2,186	8.7%	6.8%	0.6%
[13-18)	2021-Q1	3,021	4.9%	4.2%	0.2%
	2021-Q2	3,305	6.3%	7.7%	0.5%
	2021-Q3	2,910	6.8%	7.6%	0.5%
	2021-Q4	3,336	7.2%	4.1%	0.3%
	2022-Q1	3,460	7.1%	3.7%	0.3%
	2022-Q2	3,079	8.7%	4.1%	0.4%
	2022-Q3	2,756	9.5%	9.5%	0.9%
	2022-Q4	2,997	10.2%	8.1%	0.8%
	2023-Q1	3,506	12.1%	5.0%	0.6%

	2023-Q2	2,882	14.5%	6.9%	1.0%
	2023-Q3	2,518	18.8%	5.9%	1.1%
	2023-Q4	2,035	26.1%	3.8%	1.0%
	2021-Q1	9,272	6.8%	48.9%	3.3%
	2021-Q2	10,489	7.3%	48.8%	3.6%
	2021-Q3	10,163	7.0%	46.1%	3.2%
	2021-Q4	9,323	7.6%	43.3%	3.3%
	2022-Q1	8,926	8.3%	44.4%	3.7%
	2022-Q2	9,281	8.7%	46.5%	4.0%
	2022-Q3	9,469	9.4%	45.7%	4.3%
	2022-Q4	8,749	10.3%	44.5%	4.6%
	2023-Q1	8,888	13.3%	47.3%	6.3%
	2023-Q2	9,089	14.4%	44.4%	6.4%
	2023-Q3	8,958	17.2%	42.7%	7.4%
[18-35)	2023-Q4	5,732	20.3%	40.2%	8.2%
	2021-Q1	10,490	6.9%	49.3%	3.4%
	2021-Q2	12,631	8.2%	51.5%	4.2%
	2021-Q3	12,832	7.9%	53.6%	4.2%
	2021-Q4	11,410	8.0%	51.5%	4.1%
	2022-Q1	10,738	8.6%	53.3%	4.6%
	2022-Q2	11,999	10.0%	50.1%	5.0%
	2022-Q3	12,795	10.8%	53.1%	5.7%
	2022-Q4	11,854	12.1%	54.4%	6.6%
	2023-Q1	11,948	13.7%	54.1%	7.4%
	2023-Q2	12,978	15.4%	54.6%	8.4%
	2023-Q3	12,885	18.3%	48.6%	8.9%
[35-65)	2023-Q4	8,160	20.8%	47.9%	10.0%
	2021-Q1	2,687	4.8%	18.4%	0.9%
	2021-Q2	3,275	5.0%	33.3%	1.7%
	2021-Q3	3,134	5.1%	24.8%	1.3%
	2021-Q4	3,065	4.7%	28.7%	1.3%
	2022-Q1	2,981	5.3%	26.1%	1.4%
	2022-Q2	3,268	6.1%	26.5%	1.6%
	2022-Q3	3,342	6.6%	33.0%	2.2%
	2022-Q4	3,385	7.7%	33.2%	2.5%
	2023-Q1	3,267	8.1%	30.7%	2.5%
	2023-Q2	3,474	10.0%	29.8%	3.0%
	2023-Q3	3,620	12.2%	28.7%	3.5%
65+	2023-Q4	2,402	12.6%	27.7%	3.5%

Table 2: Fentanyl Testing and Positivity by Rurality

RUCA	Period	Encounters	Fentanyl		
			Tested	Positive	Tested*Pos
Rural	2021-Q1	1,447	3.0%	43.9%	1.3%
	2021-Q2	1,627	3.3%	32.1%	1.0%
	2021-Q3	1,588	2.9%	32.6%	0.9%
	2021-Q4	1,574	4.1%	50.0%	2.0%
	2022-Q1	1,528	3.9%	37.3%	1.4%
	2022-Q2	1,577	4.1%	37.5%	1.5%
	2022-Q3	1,606	5.7%	50.5%	2.9%
	2022-Q4	1,446	3.9%	57.1%	2.2%
	2023-Q1	1,561	7.0%	45.4%	3.2%
	2023-Q2	1,482	5.5%	38.3%	2.1%
	2023-Q3	1,550	7.9%	31.7%	2.5%
	2023-Q4	1,095	9.1%	31.0%	2.8%
Urban	2021-Q1	25,750	6.3%	41.8%	2.6%
	2021-Q2	29,986	7.3%	44.0%	3.2%
	2021-Q3	29,239	7.2%	43.7%	3.1%
	2021-Q4	27,414	7.4%	39.9%	2.9%
	2022-Q1	26,386	7.9%	41.0%	3.2%
	2022-Q2	28,001	8.9%	40.9%	3.6%
	2022-Q3	28,599	9.7%	43.7%	4.2%
	2022-Q4	27,322	10.8%	43.0%	4.6%
	2023-Q1	27,931	12.7%	42.6%	5.4%
	2023-Q2	28,893	14.5%	42.7%	6.2%
	2023-Q3	28,224	17.1%	39.9%	6.8%
	2023-Q4	18,627	20.1%	36.4%	7.3%