Riverside University HEALTH SYSTEM
Public Health

Regional Patterns in Fentanyl-Involved Overdose Deaths

Unintentional Fentanyl Overdose Deaths in Riverside County, CA

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INTRODUCTION

Fentanyl is a synthetic opioid, meaning it is manufactured in a laboratory rather than derived from natural sources. Across the nation, fentanyl-involved overdose deaths—primarily driven by illicit drug use—pose an ongoing threat to public health. Riverside county's first reported fentanyl-involved overdose death occurred in 2011, marking the beginning of a local epidemic that would increase after 2018. As synthetic opioids like fentanyl become widespread, the impact on communities continued to escalate.

Between 2019 and 2023, unintentional overdose deaths in Riverside County doubled—from 429 to 841 fatalities. Opioid-related overdoses were the main driver, making up 67% of all overdose deaths during this period. Of these opioid-related fatalities, 81% involved fentanyl, underscoring its central role in the county's overdose crisis.

This brief provides a geographical evaluation of the impact of unintentional fentanyl-involved overdose deaths on populations living in Eastern Riverside County with those in Western Riverside County by examining differences in social determinants of health like race/ethnicity and educational attainment. The West region includes more populated areas with concentrated resources, while the East is characterized by more developing communities and limited access to services. This division helps highlight regional inequities that may be masked in overall county data.

RIVERSIDE COUNTY KEY FINDINGS / 2019-2023

There were a total of **1,957** unintentional fentanyl – involved overdose fatalities between 2019-2023.

Residents aged **25-44** make up more than half (51%) of unintentional fatal fentanyl overdose deaths (n=1,001).

Residents with an educational attainment of a high school diploma or GED had the highest fentanyl overdose death rate (**190** per 100,000) surpassing all other education attainments

Black/African American residents had the highest age-adjusted fentanyl overdose death rate (13.8 per 100,000 population).

Regional Trends

Riverside County experienced a steady rise in unintentional overdose deaths, particularly those involving fentanyl, over the past several years. From 2019 to 2023, the age-adjusted mortality rate for fentanyl-involved overdoses increased by 333% (from 5.5 to 22.1 per 100,000). In comparison, the overall unintentional drug overdose death rate increased by 104% (from 15.6 to 31.8 per 100,000) during the same period (Figure1).

Figure 1. Unintentional Fentanyl, Methamphetamine and All Drug Overdose Deaths Among Riverside County Residents, 2019-2023

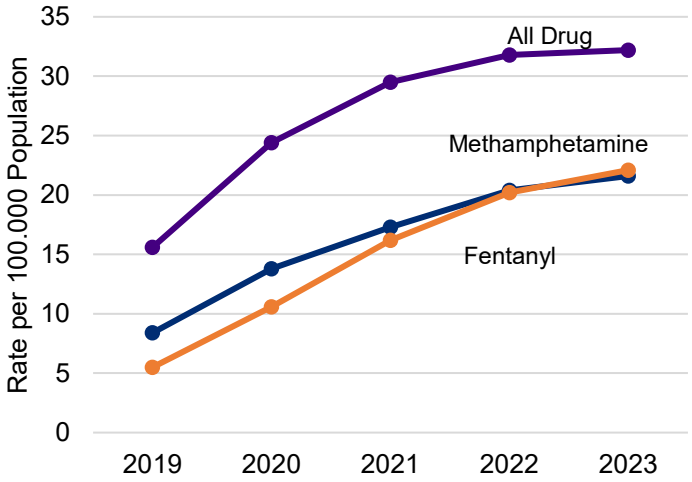
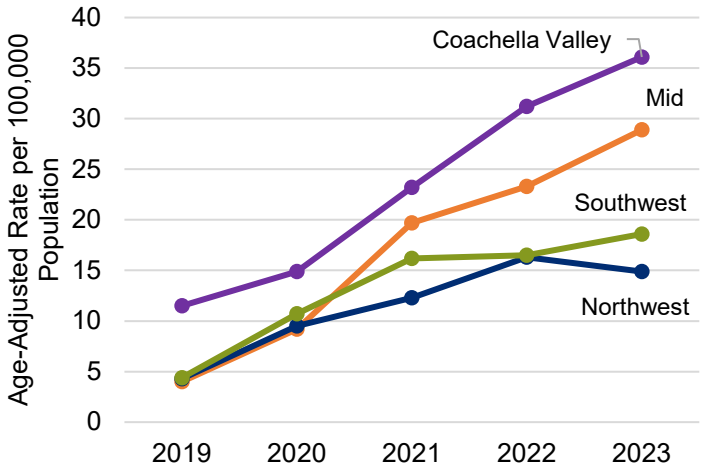


Figure 2. Unintentional Fentanyl Overdose Deaths by Region, Riverside County, CA 2019-2023



Fatal Fentanyl Overdose Trends by Geographical Region, 2019–2023

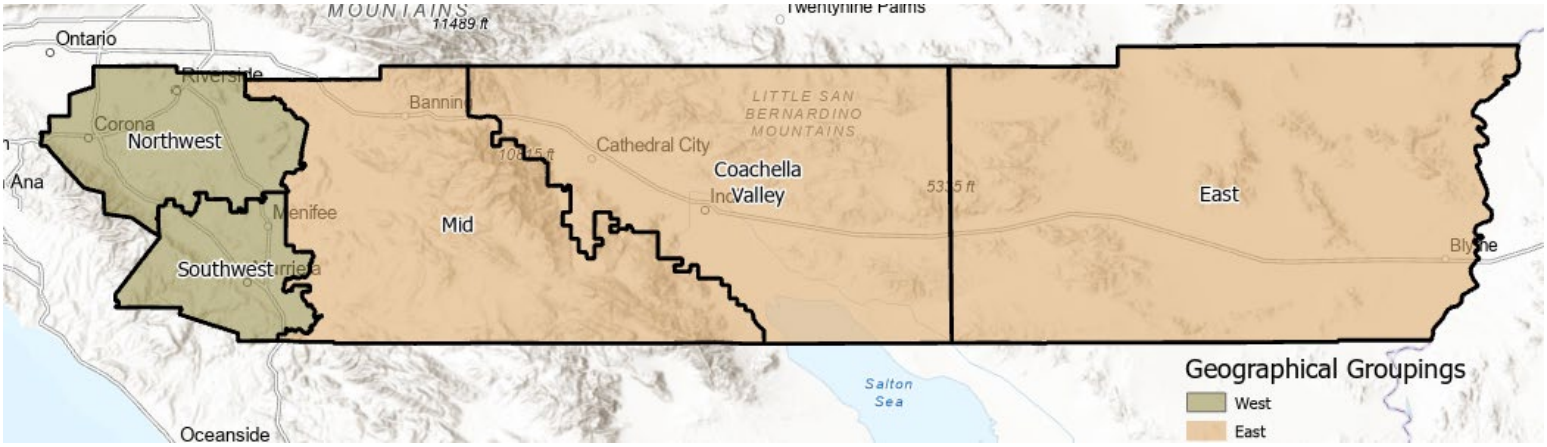
Riverside County established five public health regions in 2020 to allow for an easy way to compare geographies across multiple agencies (Figure 3). Each region follows established Census Designated Places borders and allowed for data to be shared at a city level, without splitting communities up. For this brief, the Northwest and Southwest, public health regions were combined to create a western geographical area and the Mid, Coachella Valley and East public health regions were combined to create an eastern geographical area (Figure 3). Merging the public health regions in this manner allowed overdose cases to be split to similar populations, allowed for more urbanized geographies to be compared to more rural communities, and grouped those with higher overdose rates together compared to those with lower overdose rates (Figure 2).

In 2023, the Coachella Valley region had 36.1 fentanyl-involved deaths per 100,000 population, 95% CI [30.5,42.5], and Mid County region had 28.9 fentanyl-involved deaths per 100,000, 95% CI [23.5,35.0]. It is important to note that although the East public health region has a large area, the population is very small, so rates in this area are unstable. Overall, the eastern geographical area had a five-year age adjusted rate of 20.5 per 100,000 population, 95% CI [19.1,21.9], (n=855) from 2019-2023.

Regional Trends

In 2023, the rates for Northwest was 14.9 per 100,000 population, 95% CI [12.8,17.3] and those for Southwest were 18.6 per 100,000 population, 95% CI [15.1,22.7]. Overall, the western geographical area had a five-year age adjusted rate of 12.0 per 100,000 population, 95% CI [11.2,12.7], (n=1,069) form 2019-2023.

Figure 3. Geographical Groupings for Comparing Fatal Fentanyl Overdoses, Riverside County, 2019-2023



*See notes section for a list of cities that pertain to each region.

Fentanyl Mortality by Race/Ethnicity and Educational Attainment

Table 1. Race/Ethnicity and Educational Attainment for Riverside County Residents Overdose Deaths Involving Fentanyl, 2019-2023

	Riverside County n (%)	West n (%)	East n (%)
Race/Ethnicity			
Hispanic (any race)	781 (40.6%)	441 (41.2%)	340 (39.8%)
NH American Indian/Alaska Native	14 (0.7%)	3 (0.3%)	11 (1.3%)
NH Asian	15 (0.8%)	11 (1.0%)	4 (0.5%)
NH Black/African American	156 (8.1%)	95 (8.9%)	61 (7.1%)
NH Multiple Race	67 (3.5%)	44 (4.1%)	23 (2.7%)
NH Native Hawaiian/Other Pacific Islander	7 (0.4%)	3 (0.3%)	4 (0.5%)
NH Unknown	26 (1.4%)	12 (1.1%)	14 (1.6%)
NH White	859 (44.6%)	461 (43.1%)	398 (46.5%)
Educational Attainment (Ages 25+)			
Bachelors or Higher	98 (5.4%)	47 (4.6%)	51 (6.4%)
Associate or Some College	380 (20.9%)	225 (22.1%)	155 (19.5%)
High School Diploma/GED	955 (52.6%)	534 (52.4%)	421 (52.9%)
No High School Diploma	383 (21.1%)	214 (21.0%)	169 (21.2%)

*Note: NH= Non-Hispanic. Totals may not add up to total number of fentanyl cases due to missing data.

Fentanyl Mortality by Race/Ethnicity

From 2019 to 2023, Non-Hispanic White residents accounted for the highest number of unintentional fentanyl overdose deaths in Riverside County, totaling 859; 461 in the West and 398 in the East. This represented about two-fifths of all fentanyl-involved deaths. Hispanic residents made up roughly another two-fifths, with death counts closely trailing those of White residents (Table 1). However, when considering rates, which show the relative impact across groups, a different pattern emerges. Hispanic residents across the county had lower fentanyl-related mortality rates. Residents on the eastern side of Riverside County had higher fentanyl-related fentanyl rates by race/ethnicity than those on the western side. Even though rates by race/ethnicity varied by geography, it is important to note that the mortality rates between White and Black/African American groups did not differ significantly within each respective geographical grouping (i.e. Table 2 shows White mortality rates in the western end of the County were 15.9 per 100,000 compared to 15.5 per 100,000 for Black/African Americans in the same geographical area).

Notably, the fentanyl overdose mortality rate among Hispanic residents was nearly half that of White residents in both eastern and western geographical groupings (West: SRR 0.6 [95% CI, 0.5–0.8); East: SRR 0.6 [95% CI, 0.4,0.7]). Although this follows a general pattern for overall fentanyl-involved mortality rates in the United States, there is limited research available to explain differences in outcomes across racial groups (Garnett & Miniño, 2026). Cano et.al. found that foreign-born racial/ethnic groups had lower overdose fatality rates (Cano, 2022). Given the fact that Riverside County has a relatively large foreign-born community, 21.9% compared to 14.1% in the United States, it would be beneficial to study this group along with first-born generations to determine what protective factors may exist (U.S. Census Bureau, n.d.).

Table 2. Age-Adjusted Mortality Rates and Standardized Rate Ratios for Overdose Deaths Involving Fentanyl by Race/Ethnicity, Riverside County, 2019–2023.

	Riverside County		West		East	
	Age-Adjusted Rate Per 100,000 (95% CI)	Adjusted Rate Ratio (95% CI)	Age-Adjusted Rate Per 100,000 (95% CI)	Adjusted Rate Ratio (95% CI)	Age-Adjusted Rate Per 100,000 (95% CI)	Adjusted Rate Ratio (95% CI)
White	19.5 (18.2,20.9)	1.0 (0.9,1.1)	15.9 (14.4,17.4)	1.0 (0.9,1.1)	27.2 (24.4,30.2)	1.0 (0.9,1.1)
Black or African American	19.3 (16.3,22.6)	1.0 (0.8 , 1.2)	15.5 (12.5,19.1)	1.0 (0.8,1.2)	30.9 (23.5,40.0)	1.1 (0.9,1.4)
Hispanic	11.7 (10.9,12.6)	0.6 (0.5, 0.7)	9.9 (9.0,10.9)	0.6 (0.5,0.8)	15.3 (13.7,17.1)	0.6 (0.4,0.7)

*Note: Rates for other racial and ethnic groups are not shown due to small numbers that produce unstable estimates.

Fentanyl Mortality by Educational Attainment

Due to limitations in population data by age group, age-adjusted rates were not calculated for education-level comparisons. However, a distinct pattern emerged when examining crude overdose death rates by educational attainment across Riverside County. Individuals residing in the West region experienced higher crude rates across all educational levels compared to those in the East. Countywide, crude overdose death rates were inversely related to educational attainment except for those with no high school diploma or GED Those with only a high school diploma or GED had the highest crude mortality rate—more than seven times greater than individuals with a bachelor's degree or higher. Relative to those with a bachelor's degree or higher, the fentanyl overdose mortality rate was more than eight times as high for those that had a high school diploma/GED in the West (SRR 8.2 [95% CI, 6.0-11.1]) compared to seven times as high in the East (SRR 7.1 [95% CI, 5.3-9.6]) (Table 3).

Findings for educational attainment of a high school diploma or GED up to Bachelors or higher align with prior research linking lower educational attainment to increased risk of overdose mortality. However, for those that did not attain a high school diploma or GED, the rate was lower, suggesting that other factors present among this group may have a protective effect. Literature on lower education and its correlation higher overdose deaths relates to economic insecurity, limited job opportunities, and heightened financial stress—all of which may increase vulnerability to substance use and overdose (Cano et al, 2023). Differences in drug markets across regions may also influence this pattern. While educational attainment is only one aspect of socioeconomic status, these results highlight its critical role in overdose vulnerability and point to the need for targeted outreach to individuals with mid-level education and limited economic opportunity.

Table 3. Fentanyl-involved Overdose Death Rates and Rate Ratios Among those aged 25+, by Educational Attainment, Riverside County, 2019–2023.

	Riverside County		West		East	
	Age-Specific Rate Per 100,000 (95% CI)	Rate Ratio (95% CI)	Age-Specific Rate Per 100,000 (95% CI)	Rate Ratio (95% CI)	Age-Specific Rate Per 100,000 (95% CI)	Rate Ratio (95% CI)
Bachelors or Higher	24.8 (19.8 , 29.7)	1.0 (Reference)	34.4 (24.4 , 44.3)	1.0 (Reference)	19.6 (14.1 , 25.1)	1.0 (Reference)
Associate or Some College	62.0 (55.2 , 66.8)	2.5 (2.0 , 3.1)	102.0 (87.2 , 116.9)	3.0 (2.1 , 4.1)	40.7 (33.9 , 47.6)	2.1 (1.5, 2.9)
High School diploma/GED	190.9 (177.8 , 204.0)	7.7 (6.2 , 9.5)	280.8 (254.5 , 307.2)	8.2 (6.0 , 11.1)	139.3 (125.3 , 153.4)	7.1 (5.3 , 9.6)
No High School Diploma	16.4 (14.5 , 18.2)	0.7 (0.5 , 0.8)	24.9 (21.1 , 28.6)	0.7 (0.5 , 1.0)	11.5 (9.6 , 13.5)	0.6 (0.4 , 0.8)

CONCLUSION

Unintentional fentanyl overdose deaths in Riverside County disproportionately impact certain populations. Differences in unintentional overdose death rates by race and ethnicity were observed between the East and West of Riverside County with the East having higher rates than the West. More research needs to be done to understand whether the observed differences in rates may be due to systemic disparities. This brief highlights that the Hispanic population in Riverside County have much lower rates, suggesting a protective effect among this group. This highlights the need to assess cultural differences that may be influencing this phenomenon.

This brief also highlighted that individuals whose highest level of education was a high school diploma represented the largest share of fentanyl overdose fatalities. Interestingly, those without a high school diploma show lower reported rates of overdose deaths. This pattern warrants further investigation, including an examination of how many individuals in this group may be foreign-born, which generally have lower educational attainment, which could influence exposure, risk, or reporting (U.S. Census 2023 & U.S. Census 2024).

Geographic variation within the county, particularly between the eastern and western groupings, further underscores how social determinants of health and disparities in regional resources shape overdose outcomes. Public health responses must be targeted, equitable, and community-driven, with a focus on culturally relevant prevention strategies, expanding treatment access, and improving educational outreach in high-burden groups.

NOTES

- Fatal overdose deaths are reported by date of death.
- Data Source: Cal-IVRS, death certificate data (2019-2023). Riverside County, California. Extracted 10/23/2025.
- Current data sources only provide gender as binary; RUHS – Public Health fully supports the collection, analysis, and display of gender identity data. We continue to work with partners and advocate for the collection of this data for future reporting.
- ESRI Business Analyst, 2024, was used to estimate regional population data. Extracted 10/27/2025.
- Census Bureau Benchmark Comparisons-2022 population age 25+ with doctorate degree (ACS 5-year estimates) were used for estimating educational attainment.
- Reference group for race/ethnicity and education were chosen due to utility of the groups.
- Confidence Interval (CI) is a range of values that likely contains the true result, rather than just giving a single estimate. For example, a 95% confidence interval means researches are very confident the real value falls within that range based on the data that was collected.

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SUGGESTED CITATION

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