# Letters

#### **RESEARCH LETTER**

## Trends in Drug Overdose Deaths Among US Adolescents, January 2010 to June 2021

The illicit drug supply has increasingly become contaminated with illicitly manufactured fentanyls and other synthetic opioid and benzodiazepine analogues.<sup>1</sup> Adolescent drug use rates remained generally stable between 2010 and 2020,

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Supplemental content

with 30.2% and 30.4%, respectively, of 10th-graders reporting any illicit drug use in

the past 12 months, which declined to 18.7% of 10th-graders in 2021.<sup>2</sup> However, given the increase in illicit fentanyls and potential associated risks, we assessed shifts in overdose deaths among adolescents.

**Methods** | We calculated drug overdose deaths per 100 000 population for adolescents (aged 14-18 years), compared with the overall population, from January 2010 to June 2021, using data from the Centers for Disease Control and Prevention WON-DER (Wide-Ranging Online Data for Epidemiologic Research) database,<sup>3</sup> containing records on all US deaths for which drug overdose was listed as the underlying cause of death. Values for January to June 2021 were provisional and annualized by proportional scaling. Descriptive trends by specific substance involvement were assessed using International Statistical Classification of Diseases and Related Health Problems, Tenth Revision multiple cause of death codes (eAppendix in the Supplement) and by ethnicity (Latinx) and race (American Indian or Alaska Native, Black or African American, White) as categorized in the underlying records. Rationale for assessment of race and ethnicity is described in footnote c of the Table. Analyses were conducted using R version 4.0.3. This study was deemed exempt from review and informed consent by the University of California, Los Angeles institutional review board.

**Results** | There were 518 deaths among adolescents (2.40 per 100 000 population) in 2010, with rates remaining stable through 2019 with 492 deaths (2.36 per 100 000). Deaths increased to 954 (4.57 per 100 000) in 2020 and to 1146 (5.49 per 100 000) in 2021. Between 2019 and 2020, overdose mortality increased by 94.03% and from 2020 to 2021 by 20.05%.

In the overall population, numbers of overdose deaths were higher and rates increased steadily from 2010 (n = 38329; 12.4 per 100 000) to 2020 (n = 91799; 27.86 per 100 000) and 2021 (n = 101954; 31.06 per 100 000). The percent change was 29.48% from 2019 to 2020 and 11.48% from 2020 to 2021 (Table).

Table.	Characteristics of	Adolescent Overdos	se Deaths, 2010, 2019, 202	20, and 2021ª
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	2010		2019		2020			2021 <sup>b</sup>		
Characteristics	Deaths, No.	Rate	Deaths, No.	Rate	Deaths, No.	Rate	Change, %	Deaths, No.	Rate	Change, %
Total among overall population	38 329	12.41	70630	21.52	91799	27.86	29.48	101 954	31.06	11.48
Total among adolescents	518	2.40	492	2.36	954	4.57	94.03	1146	5.49	20.05
Substance										
Benzodiazepines	83	0.38	71	0.34	142	0.68	100.13	152	0.73	6.97
Cocaine	22	0.10	53	0.25	84	0.40	58.59	84	0.40	-0.07
Heroin	52	0.24	37	0.18	40	0.19	8.18	26	0.12	-35.04
Illicit fentanyls and synthetics	38	0.18	253	1.21	680	3.26	168.95	884	4.23	29.91
Methamphetamine	38	0.18	80	0.38	104	0.50	30.09	112	0.54	7.62
Prescription opioids	159	0.74	52	0.25	74	0.35	42.40	66	0.32	-10.87
Race and ethnicity <sup>c</sup>										
American Indian or Alaska Native, non-Hispanic	11	4.86	14	6.88	16	7.87	14.37	24	11.79	49.89
Black or African American, non-Hispanic	24	0.70	46	1.49	114	3.69	148.22	96	3.10	-15.92
Latinx	62	1.38	136	2.68	276	5.35	99.44	354	6.98	30.51
White, non-Hispanic	412	3.32	281	2.50	521	4.67	87.02	604	5.36	14.93

<sup>a</sup> Drug overdose deaths among high school-aged adolescents (14-18 years), shown as counts, and rates per 100 000 population for 2010, 2019, 2020, and 2021, compared with values for the all-age US population. Data for adolescents are also stratified by substance involved and race and ethnicity. Year-to-year percentage increases are shown for 2020 (relative to 2019) and 2021 (relative to 2020). annualized.

<sup>c</sup> Race and ethnicity were assessed in this study, as categorized in the underlying records, because recent data have suggested that racial and ethnic inequalities in overdose are increasing among the general population and may also be a concern among the adolescent population assessed herein.<sup>5</sup> Trends among Asian individuals were not included because of differences between the representation of this group in the preliminary and final databases used.

<sup>b</sup> 2021 refers to January to June 2021, and rates and counts have been

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#### Figure. Adolescent Overdose Deaths, 2010-2021



Drug overdose rates per 100 000 adolescents are shown by (A) substance involved and (B) race and ethnicity. The year 2021 refers to January to June 2021, and rates have been annualized. The vertical dashed lines delineate the prepandemic and pandemic periods of observed data.

Among adolescents, fentanyl-involved fatalities increased from 253 (1.21 per 100 000) in 2019 to 680 (3.26 per 100 000) in 2020 and to 884 (4.23 per 100 000) in 2021 (Figure, A). In 2021, fentanyls were identified in 77.14% of adolescent overdose deaths, compared with 13.26% for benzodiazepines, 9.77% for methamphetamine, 7.33% for cocaine, 5.76% for prescription opioids, and 2.27% for heroin.

American Indian and Alaska Native adolescents experienced the highest overdose rate in 2021 (n = 24; 11.79 per 100 000), followed by Latinx adolescents (n = 354; 6.98 per 100 000) (Figure, B).

**Discussion** | Beginning in 2020, adolescents experienced a greater relative increase in overdose mortality than the overall population, attributable in large part to fatalities involving fentanyls. In the context of decreasing adolescent drug use rates nationally,<sup>2</sup> these shifts suggest heightened risk from illicit fentanyls, which have variable and high potency.<sup>1</sup> Since 2015, fentanyls have been increasingly added to counterfeit pills resembling prescription opioids, benzodiazepines, and other drugs, which adolescents may not identify as dangerous and which may be playing a key role in these shifts.<sup>1,4</sup>

The highest rates of overdose deaths were among American Indian and Alaska Native adolescents, which have also been reported among adults in this population in 2020.<sup>5</sup> High rates among Latinx adolescents contrast with relatively lower rates among Latinx adults.<sup>5</sup> These adolescent trends fit a wider pattern of increasing racial and ethnic inequalities in overdose that deserve further investigation and intervention efforts.<sup>5</sup>

Study limitations include the observational design that cannot establish causality, that race and ethnicity may be incorrectly assigned in some death investigations, that results from 2021 were provisional and include proportionally scaled values from January to June, and small numbers in some subgroups. In addition, the contribution of factors unique to the COVID-19 pandemic, such as suicidal ideation, mental illness, social isolation, and disruptions to illicit drug markets, cannot be discerned.<sup>6</sup>

Increasing adolescent overdose deaths, in the context of increasing availability of illicit fentanyls, highlight the need for accurate harm-reduction education for adolescents and greater access to naloxone and services for mental health and substance use behaviors.

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Acquisition, analysis, or interpretation of data: Friedman, Shover, Gone, Schriger. Drafting of the manuscript: Friedman, Godvin, Schriger.

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