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Intimate Partner Violence and Pregnancy and Infant Health Outcomes — Pregnancy Risk Assessment Monitoring System, Nine U.S. Jurisdictions, 2016–2022

Megan Steele-Baser, PhD[1]; Alyssa L. Brown, PhD[2,3]; Denise V. D'Angelo, MPH[1]; Kathleen C. Basile, PhD[1]; Rosalyn D. Lee, PhD[1]; Antoinette T. Nguyen, MD[2]; Cynthia H. Cassell, PhD[2]

Abstract

Intimate partner violence (IPV) can include emotional, physical, or sexual violence. IPV during pregnancy is a preventable cause of injury and death with negative short- and long-term impacts for pregnant women, infants, and families. Using data from the 2016–2022 Pregnancy Risk Assessment Monitoring System in nine U.S. jurisdictions, CDC examined associations between IPV during pregnancy among women with a recent live birth and the following outcomes: prenatal care initiation, health conditions during pregnancy (gestational diabetes, pregnancy-related hypertension, and depression), substance use during pregnancy, and infant birth outcomes. Overall, 5.4% of women reported IPV during pregnancy. Emotional IPV was most prevalent (5.2%), followed by physical (1.5%) and sexual (1.0%) IPV. All types were associated with delayed or no prenatal care; depression during pregnancy; cigarette smoking, alcohol use, marijuana or illicit substance use during pregnancy; and having an infant with low birth weight. Physical, sexual, and any IPV were associated with having a preterm birth. Physical IPV was associated with pregnancy-related hypertension. Evidence-based prevention and intervention strategies that address multiple types of IPV are important for supporting healthy parents and families because they might reduce pregnancy complications, depression and substance use during pregnancy, and adverse infant outcomes.

Introduction

Intimate partner violence (IPV) during pregnancy can cause maternal orthopedic and head injuries, obstetric complications, and fetal injury or death (*1*). Approximately 40% of homicides among persons known to be pregnant or within a year of pregnancy are related to IPV (*2*). IPV during pregnancy is also associated with delayed prenatal care (*3*), depression and posttraumatic stress disorder, substance use, and adverse birth outcomes (*4*). Some demographic groups experience a disproportionate prevalence of IPV during pregnancy, including Black or African American, American Indian or Alaska Native, multiracial, and younger women (*5*). Although studies have examined maternal mortality from violence, less is known about maternal morbidity from IPV (*6*). Similarly, the effects of emotional or sexual IPV during pregnancy are not as well understood as those resulting from physical violence (*3*,*6*). IPV can affect pregnancy health through physiologic responses to stress (*6*,*7*) and by influencing health-related behaviors, including use of prenatal care (*3*). This report examines associations

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between emotional, physical, sexual, or any IPV type during pregnancy and initiation of prenatal care, health conditions and substance use during pregnancy, and infant birth outcomes.

Methods

Data Source

The Pregnancy Risk Assessment Monitoring System (PRAMS) is a collaboration between CDC and 50 participating U.S. jurisdictions to conduct jurisdiction-specific, population-based surveillance on experiences before, during, and after pregnancy among women with a recent live birth. Participants are surveyed by mail or telephone 2–6 months postpartum (*8*). This report used 2016–2022 data from nine jurisdictions* that had data available for at least 1 study year and that included questions about emotional, physical, and sexual IPV during pregnancy. PRAMS data are weighted annually by jurisdiction to adjust for sample design, nonresponse, and noncoverage.† The aggregate weighted data in this report represent the total population of women with a live birth in the included jurisdictions and years.

Measures

Respondents were asked about experiencing emotional, physical, and sexual violence from their husband or partner during pregnancy§ (Supplementary Box, https://stacks.cdc.gov/view/cdc/170631). A dichotomous measure for any type of IPV was created by combining "yes" responses to one or more types of IPV-related experiences. Respondents also answered questions about initiation of prenatal care,¶ health conditions during pregnancy (gestational diabetes, pregnancy-related hypertension,** and depression), and substance use during pregnancy (cigarette smoking during the last 3 months of pregnancy, alcohol use during the last 3 months of pregnancy, and marijuana or illicit substance use any time during

* Data from nine jurisdictions that met the response rate threshold for each year during the respective period (≥55% for 2016–2017 and ≥50% for 2018–2022): Arkansas (2016 and 2018–2021), District of Columbia (2018–2022), Indiana (2018), Kansas (2017–2022), Mississippi (2018–2021), Pennsylvania (2016–2022), South Dakota (2017–2022), Washington (2016–2022), and Wisconsin (2016–2022).

† Each participating jurisdiction selects a monthly stratified sample of women from birth certificate records. Data were weighted by jurisdiction annually to adjust for sample design, noncoverage, and nonresponse and to represent the total population of women with a live birth in each jurisdiction in that year. PRAMS aggregate data are not weighted to provide national estimates. https://www.cdc.gov/prams/php/methodology/index.html

§ Questions for emotional and sexual IPV during pregnancy asked only about violence by a husband or partner. Although the question for physical IPV during pregnancy has a response option for "ex-husband or ex-partner," only physical IPV by a husband or partner was included to align with emotional and sexual IPV questions. https://www.cdc.gov/prams/php/questionnaires/

¶ Prenatal care initiation was based on respondent self-report of how many weeks or months pregnant they were at their first prenatal care visit. Delayed or no prenatal care was defined as entry into prenatal care after the first trimester or report of no prenatal care.

** Pregnancy-related hypertension was based on respondent self-report of having high blood pressure that started during their most recent pregnancy or having preeclampsia or eclampsia during their most recent pregnancy.

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pregnancy).[††] Information on infant birth outcomes, including low birth weight, preterm birth, small for gestational age, and large for gestational age, were obtained from linked birth certificate data.[§§]

Data Analysis

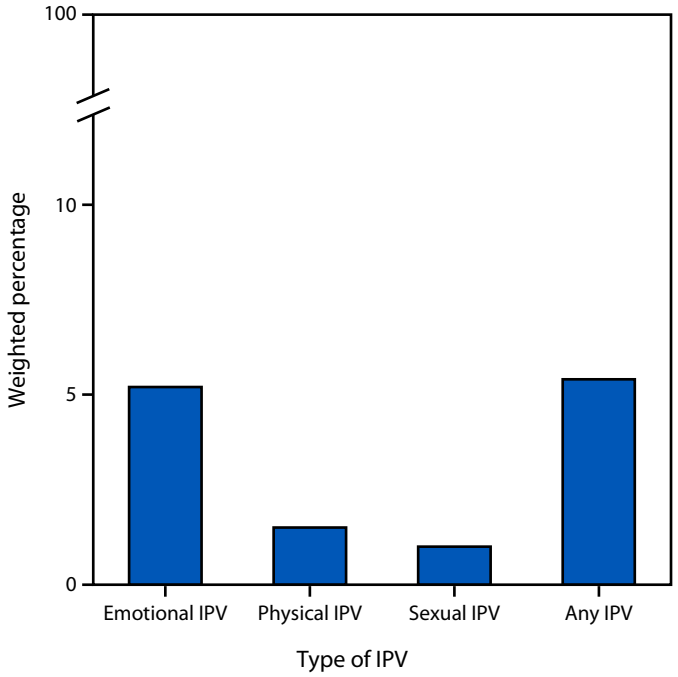
The analysis includes 47,796 respondents from nine U.S. jurisdictions that collected information on emotional, physical, and sexual IPV during pregnancy. Weighted prevalence was estimated for each IPV type. Multivariable logistic regression was used to calculate adjusted prevalence ratios and 95% CIs for initiation of prenatal care, conditions during pregnancy, substance use during pregnancy, and birth outcomes by each IPV type experienced during pregnancy. Analyses for birth outcomes were restricted to singleton births.[¶¶] All models were adjusted for respondent's age, race and ethnicity, education, health insurance at delivery, and number of previous live births.[***] In addition, models examining gestational diabetes, pregnancy-related hypertension, and birth outcomes were adjusted for prepregnancy body mass index.[†††] These characteristics were selected a priori as potential confounders based on previous research (*1*,*3*–*6*). Statistical significance was determined by whether CIs overlapped the null of 1.0. Analyses were conducted using SAS-callable SUDAAN (version 11.0.4; RTI International) to account for complex survey design. This study was reviewed and approved by the Institutional Review Boards of CDC and participating jurisdictions.[§§§]

Results

Overall, 5.4% of women reported any type of IPV during pregnancy: emotional (5.2%), physical (1.5%), and sexual (1.0%) (Figure). The adjusted prevalence of depression, cigarette smoking, and marijuana or illicit substance use during pregnancy among women who reported emotional, physical, sexual, or any IPV type during pregnancy was approximately twice that of women who did not report each respective IPV type (Table 1). Higher prevalences of delayed or no prenatal care and alcohol use during pregnancy were also found among women who reported emotional, physical, sexual, or any IPV type during pregnancy compared with women who did not report these IPV types. The prevalence of pregnancy-related hypertension among women who reported physical IPV during pregnancy was 1.30 times as high as that among those who did not, whereas the prevalence of gestational diabetes was 0.39 times lower than that among those not reporting physical IPV.

The prevalence of having an infant with low birth weight was higher among women who reported emotional, physical, sexual, or any IPV type than among those who did not report these IPV types (Table 2). The prevalence of having a preterm birth was higher among women who reported physical, sexual, or any IPV type than it was among those who did not report these IPV types.

FIGURE. Prevalence of types of intimate partner violence during pregnancy among women with a recent live birth — Pregnancy Risk Assessment Monitoring System, nine U.S. jurisdictions, 2016–2022*,†



Abbreviation: IPV = intimate partner violence.

* A total of 47,796 respondents were included in this analysis. Data from nine jurisdictions that met the response rate threshold for each year during the respective period (≥55% for 2016–2017 and ≥50% for 2018–2022): Arkansas (2016 and 2018–2021), District of Columbia (2018–2022), Indiana (2018), Kansas (2017–2022), Mississippi (2018–2021), Pennsylvania (2016–2022), South Dakota (2017–2022), Washington (2016–2022), and Wisconsin (2016–2022).

† Each participating jurisdiction selects a monthly stratified sample of women from birth certificate records. Data were weighted by jurisdiction annually to adjust for sample design, noncoverage, and nonresponse and to represent the total population of women with a live birth in each jurisdiction in that year. The aggregate weighted data represent the total population of women with a live birth in the included jurisdictions and years.

[††] Data on alcohol use during pregnancy were available from four jurisdictions: Mississippi, Pennsylvania, South Dakota, and Washington. Data on marijuana or illicit drug use during pregnancy were available from five jurisdictions: District of Columbia, Indiana, Kansas, South Dakota, and Wisconsin.

[§§] Low birth weight was defined as a birth weight of <5.5 lbs (<2,500 g), preterm birth was defined as birth at a gestational age of <37 weeks, small for gestational age was defined as a birth weight <10th percentile for gestational age, and large for gestational age was defined as a birth weight >90th percentile for gestational age.

[¶¶] For infant birth outcomes, analyses were restricted to singleton births because measures were based on singleton growth and birth weight references.

[***] Information on respondent age, race and ethnicity, education, health insurance at delivery, and number of previous live births was obtained from linked birth certificate data.

[†††] Prepregnancy body mass index was calculated from prepregnancy height and weight self-reported on the PRAMS questionnaire. https://www.cdc.gov/bmi/about/index.html

[§§§] 45 C.F.R. part 46, 21 C.F.R. part 56.

TABLE 1. Association of types of intimate partner violence with prenatal care initiation, health conditions during pregnancy, and substance use among women with a recent live birth — Pregnancy Risk Assessment Monitoring System, nine U.S. jurisdictions, 2016–2022*

	Prenatal care†	Health conditions during pregnancy†			Substance use†		
Type of IPV	Delayed or no prenatal care§ aPR††† (95% CI)	Gestational diabetes¶ aPR§§§ (95% CI)	Pregnancy-related hypertension** aPR§§§ (95% CI)	Depression†† aPR††† (95% CI)	Cigarette smoking during the last 3 months of pregnancy§§ aPR††† (95% CI)	Any alcohol use during the last 3 months of pregnancy¶¶ aPR††† (95% CI)	Marijuana or illicit substance use during pregnancy*** aPR††† (95% CI)
Emotional IPV during pregnancy¶¶¶							
Yes	1.38 (1.21–1.58)****	0.91 (0.72–1.15)	1.09 (0.94–1.26)	2.72 (2.50–2.96)****	2.32 (2.04–2.63)****	1.50 (1.15–1.97)****	2.71 (2.18–3.38)****
No	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Physical IPV during pregnancy††††							
Yes	1.59 (1.30–1.94)****	0.61 (0.43–0.88)****	1.30 (1.03–1.64)****	2.57 (2.25–2.95)****	2.45 (2.01–3.00)****	1.96 (1.28–3.00)****	2.71 (1.95–3.75)****
No	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Sexual IPV during pregnancy§§§§							
Yes	1.60 (1.24–2.07)****	0.90 (0.57–1.41)	0.79 (0.54–1.14)	2.67 (2.24–3.17)****	2.00 (1.51–2.64)****	1.99 (1.14–3.46)****	2.85 (1.94–4.18)****
No	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Any type of IPV during pregnancy¶¶¶¶							
Yes	**1.43 (1.26–1.62)****	**0.90 (0.72–1.13)**	**1.11 (0.97–1.28)**	**2.71 (2.50–2.95)****	**2.34 (2.07–2.65)****	**1.48 (1.14–1.93)****	**2.86 (2.31–3.54)****
No	**Ref**	**Ref**	**Ref**	**Ref**	**Ref**	**Ref**	**Ref**

Abbreviations: aPR = adjusted prevalence ratio; IPV = intimate partner violence; Ref = referent group.

* Data from nine jurisdictions that met the response rate threshold for each year during the respective period (≥55% for 2016–2017 and ≥50% for 2018–2022): Arkansas (2016 and 2018–2021), District of Columbia (2018–2022), Indiana (2018), Kansas (2017–2022), Mississippi (2018–2021), Pennsylvania (2016–2022), South Dakota (2017–2022), Washington (2016–2022), and Wisconsin (2016–2022).

† All analyses were restricted to respondents with complete data on the respective outcome and demographic covariates: delayed or no prenatal care (45,446); gestational diabetes (44,251); pregnancy-related hypertension (44,179); depression during pregnancy (45,936); cigarette smoking during the last 3 months of pregnancy (46,281); any alcohol use during the last 3 months of pregnancy (25,189); and marijuana or illicit drug use during pregnancy (22,516). For alcohol use during pregnancy, the sample was restricted to respondents in four jurisdictions with available data: Mississippi, Pennsylvania, South Dakota, and Washington. For marijuana or illicit drug use during pregnancy, the sample was restricted to respondents in five jurisdictions with available data: District of Columbia, Indiana, Kansas, South Dakota, and Wisconsin.

§ Entry into prenatal care after first trimester or no prenatal care.

¶ Self-report of having gestational diabetes that started during their most recent pregnancy.

** Self-report of having high blood pressure that started during their most recent pregnancy or having preeclampsia or eclampsia during their most recent pregnancy.

†† Self-report of having depression during their most recent pregnancy.

§§ Smoked any cigarettes on an average day during the last 3 months of pregnancy.

¶¶ Had any alcoholic drinks in an average week during the last 3 months of pregnancy.

*** Used any of the following substances during their most recent pregnancy: marijuana or hash, heroin, amphetamines, cocaine, tranquilizers, or hallucinogens.

††† Adjusted for respondent age, race and ethnicity, education, health insurance at delivery, and number of previous live births.

§§§ Adjusted for respondent age, race and ethnicity, education, health insurance at delivery, number of previous live births, and prepregnancy body mass index.

¶¶¶ Defined as husband or partner doing any of the following things to the respondent: threatened or made them feel unsafe in some way, made them frightened for their safety or their family's safety because of the partner's anger or threats, or tried to control their daily activities (e.g., controlling who they could talk to or where they could go).

**** Statistically significant; 95% CIs do not cross the null of 1.0.

†††† Defined as being pushed, hit, slapped, kicked, choked, or physically hurt in any way by their husband or partner.

§§§§ Defined as being forced to take part in touching or any sexual activity by their husband or partner when they did not want to.

¶¶¶¶ Any combination of physical, emotional, or sexual IPV by their husband or partner.

Discussion

This analysis found that 5.4% of women with a live birth in nine U.S. jurisdictions during 2016–2022 experienced IPV while pregnant; emotional IPV was more commonly reported than physical and sexual IPV. Estimates of IPV during pregnancy vary across previous studies and might not include or differentiate between IPV types (*4*). Although studies have shown associations between maternal and infant outcomes and physical or combined IPV measures, research demonstrating their associations with emotional and sexual IPV is limited (*1*,*3*–*6*). This study found that all IPV types were associated with delayed or no prenatal care, depression and substance use during pregnancy, and infant low birth weight. Sexual, physical, and any IPV type also were associated with preterm birth. Depression and substance use during pregnancy can have cascading effects for the infant and family after birth.¶¶¶,**** Mental health-related deaths, including deaths by manner of suicide, overdose or poisoning related to substance use disorder, and other deaths determined to be related to a mental health condition, are the leading cause of pregnancy-related deaths.††††

In this analysis, physical IPV was associated with pregnancy-related hypertension, a risk factor for low birth weight, preterm

¶¶¶ https://www.cdc.gov/maternal-infant-health/pregnancy-substance-abuse/index.html

**** https://www.aap.org/en/patient-care/perinatal-mental-health-and-social-support/

†††† https://www.cdc.gov/maternal-mortality/php/data-research/index.html

TABLE 2. Association of types of intimate partner violence during pregnancy with infant birth outcomes among women with a recent live birth — Pregnancy Risk Assessment Monitoring System, nine U.S. jurisdictions, 2016–2022*

	Infant birth outcomes†			
	Low birth weight§	Preterm birth¶	Small for gestational age**	Large for gestational age††
Type of IPV	aPR§§ (95% CI)	aPR§§ (95% CI)	aPR§§ (95% CI)	aPR§§ (95% CI)
Emotional IPV during pregnancy¶¶				
Yes	1.30 (1.11–1.51)***	1.18 (1.00–1.41)	1.04 (0.87–1.26)	1.04 (0.83–1.31)
No	Ref	Ref	Ref	Ref
Physical IPV during pregnancy†††				
Yes	1.32 (1.03–1.69)***	1.50 (1.13–1.98)***	1.08 (0.79–1.49)	1.07 (0.74–1.55)
No	Ref	Ref	Ref	Ref
Sexual IPV during pregnancy§§§				
Yes	1.47 (1.02–2.12)***	1.54 (1.07–2.21)***	1.10 (0.73–1.67)	1.16 (0.74–1.82)
No	Ref	Ref	Ref	Ref
Any type of IPV during pregnancy¶¶¶				
Yes	**1.29 (1.11–1.50)*** **	**1.24 (1.05–1.47)*** **	**1.06 (0.88–1.26)**	**1.05 (0.84–1.30)**
No	**Ref**	**Ref**	**Ref**	**Ref**

Abbreviations: aPR = adjusted prevalence ratio; IPV = intimate partner violence; Ref = referent group.

* Data from nine jurisdictions that met the response rate threshold for each year during the respective period (≥55% for 2016–2017 and ≥50% for 2018–2022): Arkansas (2016 and 2018–2021), District of Columbia (2018–2022), Indiana (2018), Kansas (2017–2022), Mississippi (2018–2021), Pennsylvania (2016–2022), South Dakota (2017–2022), Washington (2016–2022), and Wisconsin (2016–2022).

† All analyses were restricted to respondents with singleton births and complete data on the respective outcome and demographic covariates: low birth weight (42,832); preterm birth (42,873); small for gestational age (42,755); and large for gestational age (42,755).

§ Infant birth weight of <5.5 lbs (<2,500 g).

¶ Birth occurred at <37 weeks' gestation.

** Infant birth weight <10th percentile for gestational age.

†† Infant birth weight >90th percentile for gestational age.

§§ Adjusted for respondent age, race and ethnicity, education, health insurance at delivery, number of previous live births, and prepregnancy body mass index.

¶¶ Defined as husband or partner doing any of the following things to the respondent: threatened or made them feel unsafe in some way, made them frightened for their safety or their family's safety because of the partner's anger or threats, or tried to control their daily activities (e.g., controlling who they could talk to or where they could go).

*** Statistically significant; 95% CIs do not cross the null of 1.0.

††† Defined as being pushed, hit, slapped, kicked, choked, or physically hurt in any way by their husband or partner.

§§§ Defined as being forced to take part in touching or any sexual activity by their husband or partner when they did not want to.

¶¶¶ Any combination of physical, emotional, or sexual IPV by their husband or partner.

Summary

What is already known about this topic?

Intimate partner violence (IPV) during pregnancy is a preventable cause of injury and death with negative short- and long-term impacts for pregnant women, infants, and families.

What is added by this report?

During 2016–2022, among women with a live birth in nine jurisdictions, 5.4% experienced IPV during pregnancy. Emotional IPV (5.2%) was more common than physical (1.5%) and sexual (1.0%) IPV. All IPV types were associated with delayed or no prenatal care, depression and substance use during pregnancy, and low infant birth weight.

What are the implications for public health practice?

Addressing multiple IPV types through comprehensive prevention efforts is critical to supporting maternal and infant health.

birth, and stroke.[§§§§] Physical IPV was also associated with a lower prevalence of gestational diabetes. The limited research evaluating this relationship has found no association or a higher prevalence (*7*); additional research is needed to clarify this association.

Limitations

The findings in this report are subject to at least five limitations. First, findings can only be generalized to women with live births during 2016–2022 in the U.S. jurisdictions included in this report; for some indicators, such as alcohol use during pregnancy, only a subset of included jurisdictions collected this information. Findings for birth outcomes can only be generalized to women with a live singleton birth. Second, information regarding experiences during pregnancy is self-reported in the postpartum period and subject to recall and social desirability biases (e.g., respondents might underreport sensitive experiences such as IPV or substance use). Third, IPV estimates were based on respondents' reports of acts by a husband or partner and did not include acts by ex-partners. Thus, findings likely underestimated the prevalence of IPV during pregnancy. Fourth, the IPV measures do not reflect the frequency or severity of violence or combinations of IPV types, all of which could affect the strength of associations between IPV and outcomes. Finally, reference groups for IPV

§§§§ https://www.cdc.gov/maternal-infant-health/pregnancy-complications/

measures differed by the type of IPV examined, with each reference group representing the absence of that specific IPV type. As a result, associations between different IPV types and outcomes cannot be directly compared.

Implications for Public Health Practice

This report reinforces the importance of recognizing emotional, physical, and sexual IPV during pregnancy as a serious public health concern. Prevention strategies work best when they operate across the social-ecological model, addressing factors at personal, relationship, community, and societal levels (*9*). Primary prevention strategies such as teaching healthy relationship skills and strengthening economic support for families might reduce IPV (*9*). Screening and referral by health care providers can also connect patients with services. This report highlights the need to assess multiple IPV types and provide interventions and resources. The U.S. Preventive Services Task Force recommends that health care providers screen women of reproductive age for IPV and refer those with indication of IPV to ongoing support services (*10*). IPV screening is a covered preventive service provided at no cost to patients.¶¶¶¶ Universal prevention education and information about community resources (e.g., mental health services, crisis hotlines, and shelters) can be provided to all persons regardless of IPV disclosure (*9*). Because pregnant women experiencing IPV are less likely to receive timely prenatal care, prevention education and intervention in other program models, such as home visitation programs, can be considered (*9*). By implementing comprehensive screening and intervention measures, combined with evidence-based primary prevention strategies (*9*), experiences of IPV could be reduced. Increasing awareness about the negative impacts of IPV during pregnancy and implementing effective strategies are critical for promoting the health of pregnant women, infants, and families.

¶¶¶¶ https://www.hrsa.gov/womens-guidelines

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Corresponding author: Megan Steele-Baser, MSteele-Baser@cdc.gov.

[1]Division of Violence Prevention, National Center for Injury Prevention and Control, CDC; [2]Division of Reproductive Health, National Center for Chronic Disease and Health Promotion, CDC; [3]Oak Ridge Institute for Science and Education, Oak Ridge, Tennessee.

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Detection of Illegally Manufactured Fentanyls and Carfentanil in Drug Overdose Deaths — United States, 2021–2024

Lauren J. Tanz, ScD[1]; Andrea Stewart, PhD[1]; R. Matt Gladden, PhD[1]; Jean Y. Ko, PhD[1]; Lauren Owens, MPH[1]; Julie O'Donnell, PhD[1]

Abstract

During 2023, approximately 72,000, or nearly seven in 10, drug overdose deaths in the United States were estimated to involve illegally manufactured fentanyls (IMFs). Carfentanil, a fentanyl analog 100 times more potent than fentanyl, has reemerged in the U.S. drug supply. Using CDC's State Unintentional Drug Overdose Reporting System data, this report describes trends in overdose deaths during January 2021–June 2024, overall and with IMFs detected, by U.S. Census Bureau region, and in deaths with carfentanil detected, in 45 states and the District of Columbia (DC). Numbers of deaths with carfentanil detected by state during January 2023–June 2024 in 49 states and DC are also reported. The number of overdose deaths with IMFs detected declined from 2022 to 2023 in the Northeast (3.2% decline), Midwest (7.8%), and South (2.8%) regions; deaths in the West increased 33.9%. The percentage of deaths with IMFs detected was steady at approximately 70%–80% in the Northeast, Midwest, and South. In contrast, the percentage of deaths with IMFs detected in the West increased from 48.5% during January–March 2021 to 66.5% during April–June 2024. Overdose deaths with carfentanil detected increased approximately sevenfold, from 29 during January–June 2023 to 238 during January–June 2024; during January 2023–June 2024, overdose deaths with carfentanil detected were reported in 37 states. Overdose prevention efforts that address the widespread presence of IMFs, including carfentanil, and can rapidly adapt to other potent opioids in the drug supply might result in lasting reductions in overdose deaths across the entire United States.

Introduction

In 2013, illegally manufactured fentanyl and fentanyl analogs (IMFs) entered the U.S. illegal drug supply as adulterants of or replacements for white powder heroin in the Northeast and have now replaced heroin as the dominant opioid in the United States (*1*). Introduction of IMFs led to a sharp rise in overdose deaths, likely because of their high potency and rapid onset of effects (*2*,*3*). In 2023, approximately 72,000 drug overdose deaths, or nearly seven in 10, were estimated to involve fentanyl, which is primarily illegally manufactured.*,† Provisional data project a decrease in overdose deaths in 2023 compared with the number in 2022, the first decline since 2018; the decrease appears to have continued into 2024.§ However, recent reemergence of carfentanil,¶ a fentanyl analog 100 times more potent than fentanyl (*4*), which had largely disappeared after carfentanil-involved overdose death outbreaks during 2016–2017 (*5*,*6*), might threaten this progress. Data from CDC's State Unintentional Drug Overdose Reporting System (SUDORS) were analyzed to describe recent trends in detection of IMFs and carfentanil among overdose deaths in the United States.

Methods

Data Source

Data on unintentional and undetermined intent drug overdose deaths obtained from death certificates, coroner and medical examiner reports, and postmortem toxicology reports were entered into SUDORS.** These data were entered by 49 states and the District of Columbia (DC) (jurisdictions) funded through the Overdose Data to Action in States cooperative agreement.††

Statistical Analyses

Numbers of all overdose deaths and numbers and percentages of overdose deaths with IMFs§§ detected that occurred during January 2021–June 2024 were calculated overall and by quarter (Q1 = January–March, Q2 = April–June, Q3 = July–September, and Q4 = October–December) for all jurisdictions

* https://www.cdc.gov/nchs/nvss/vsrr/prov-drug-involved-mortality.htm (Accessed September 13, 2024).

† https://www.cdc.gov/overdose-prevention/data-research/facts-stats/sudors-dashboard-fatal-overdose-data.html

§ https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm (Accessed September 13, 2024).

¶ https://www.health.ny.gov/diseases/aids/consumers/prevention/oduh/docs/2024-06-07_health_alert.pdf; https://www.ohioattorneygeneral.gov/Media/News-Releases/September-2023/Warning-Issued-for-Reemerging-Synthetic-Opioid-in; https://www.millenniumhealth.com/signalsalert/carfentanil2024/

** https://www.cdc.gov/overdose-prevention/data-research/facts-stats/about-sudors.html

†† https://www.cdc.gov/overdose-prevention/php/od2a/state.html

§§ Fentanyl was classified as likely illegally manufactured using toxicology, scene, and witness evidence. For the 9.9% of deaths with fentanyl detected that had insufficient evidence for classification as illegal or prescription, fentanyl was classified as illegal because the majority of fentanyl overdose deaths involve illegal fentanyl. All fentanyl analogs except pharmaceutical analogs (i.e., alfentanil, remifentanil, and sufentanil) were included as IMFs. Among deaths with IMFs detected, 98.4% had IMFs listed as a cause of death.

combined and for each U.S. Census Bureau region.[¶¶] Because data for January–June 2024 are preliminary, incomplete, and have not undergone full quality control measures,[***] only percentages of overdose deaths with IMFs detected are presented for this period.[†††] Numbers of overdose deaths with carfentanil detected overall, and with carfentanil co-detected with illegally manufactured fentanyl (IMF; excluding fentanyl analogs),[§§§] during January 2021–June 2024 were tabulated by 6-month period. All trend analyses included 46 jurisdictions (45 states and DC).[¶¶¶] The number of overdose deaths with carfentanil detected during January 2023–June 2024 was tabulated by state among 50 jurisdictions (49 states and DC).[****] Analyses were performed using SAS software (version 9.4; SAS Institute). This activity was reviewed by CDC, deemed not research, and was conducted consistent with applicable federal law and CDC policy.[††††]

[¶¶] U.S. Census Bureau regions were used to stratify jurisdictions into geographic regions (https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf). Region analysis included nine of nine jurisdictions in the Northeast Region, 10 of 12 jurisdictions in the Midwest Region, 16 of 17 jurisdictions in the South Region, and 11 of 13 jurisdictions in the West Region.

[***] Overdose deaths during January–June 2024 are required to be entered into SUDORS by January 24, 2025; thus, data are incomplete because not all deaths that occurred during this time frame were entered at the time of analysis. These data have not undergone extensive quality-control checks implemented after the reporting deadline. However, two independent analysts conducted appropriate data quality checks on IMFs and carfentanil. Preliminary data were downloaded from SUDORS on November 26, 2024.

[†††] Because not all overdose deaths that occurred during January–June 2024 have been entered into SUDORS, numbers of deaths overall and with IMFs detected during this time frame are underestimated and not presented. Percentages with IMFs detected during this time frame are restricted to deaths with toxicology information entered; these are expected to be accurate estimates of the percentages of all overdose deaths with IMFs detected.

[§§§] For analyses of carfentanil co-detected with IMF, IMF includes illegally manufactured fentanyl, but does not include illegally manufactured fentanyl analogs. Carfentanil itself is an illegally manufactured fentanyl analog.

[¶¶¶] Alabama, Alaska, Arizona, Arkansas, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Vermont, Virginia, Washington, and West Virginia. For inclusion, jurisdictions were required to report ≥75% of deaths in their jurisdiction in each 6-month period during January 2021–December 2023.

[****] Jurisdictions were included if they reported any drug overdose deaths to SUDORS during January 2023–June 2024. North Dakota was not included because it is not funded for SUDORS. For January–December 2023, all jurisdictions except one reported ≥90% of drug overdose deaths in their jurisdiction. For January–June 2024, the percentage of overdose deaths reported by jurisdiction was not calculated because data are preliminary and incomplete. Texas and Wyoming only include data on deaths during January–June 2024 per funding agreement.

[††††] 45 C.F.R. part 46.102(l)(2), 21 C.F.R. part 56; 42 U.S.C. Sect. 241(d); 5 U.S.C. Sect. 552a; 44 U.S.C. Sect. 3501 et seq.

Results

Overdose Deaths with IMFs Detected

During January 2021–December 2023, a total of 251,089 unintentional and undetermined intent drug overdose deaths occurred in 46 jurisdictions, including 188,082 (74.9%) with IMFs detected. Overdose deaths with IMFs detected increased 4.9%, from 60,674 in 2021 to 63,674 in 2022 and were stable from 2022 to 2023 (63,734) (Figure 1). However, during 2023, overdose deaths with IMFs detected peaked in Q2 at 16,814, declined 4.7% in Q3 to 16,019, and declined another 11.2% in Q4 to 14,229. The number of deaths with IMFs detected was 7.8% lower during the second half of 2023 (30,248) than during the second half of 2022 (32,802). Overall fatal drug overdose trends were similar to trends in deaths with IMFs detected during 2021–2023; during 2023, overdose deaths peaked in Q2 and declined thereafter.

Overdose Deaths with IMFs Detected, by U.S. Census Bureau Region

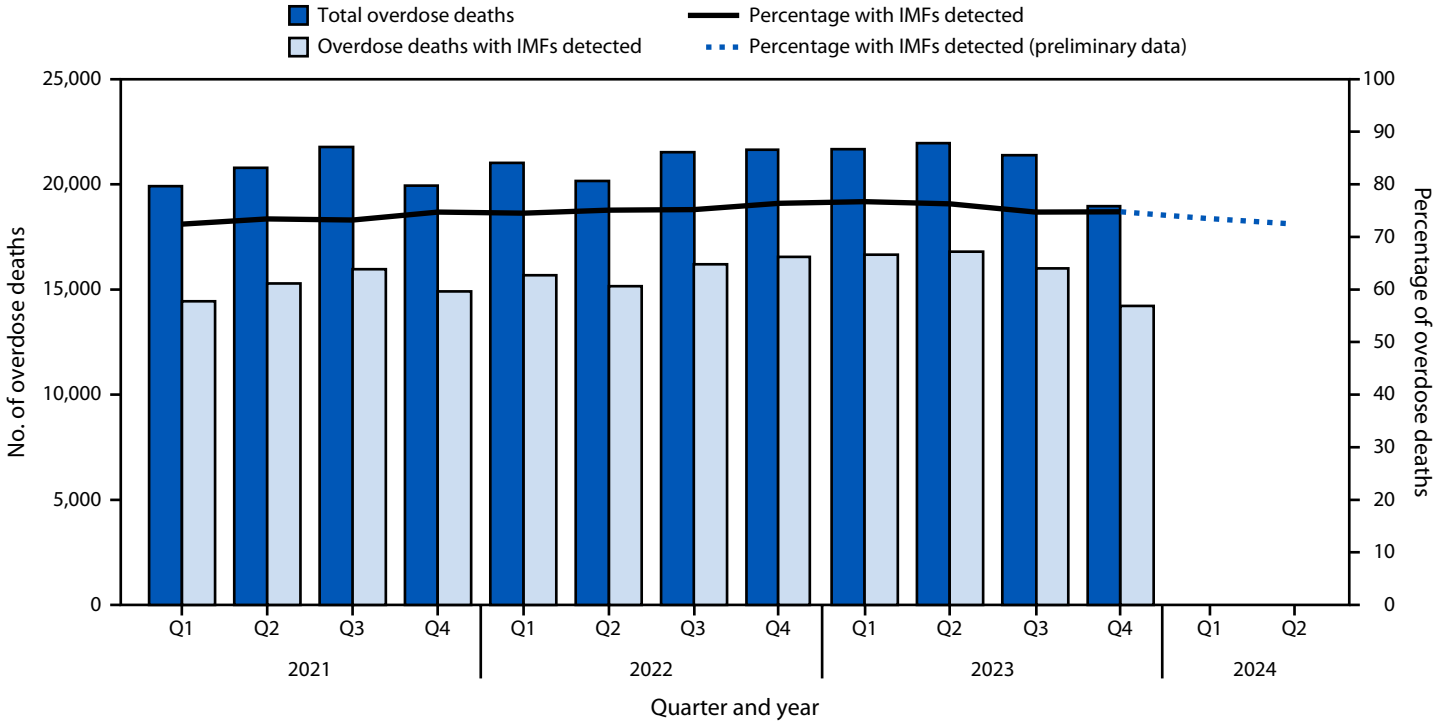
Northeast, Midwest, and South. During January 2021–June 2024, IMFs were detected in 81.5% of overdose deaths in the Northeast, 75.4% in the Midwest, and 74.9% in the South regions; percentages of overdose deaths with IMFs detected were stable throughout the time frame (Figure 2). From 2021 to 2022, the number of deaths with IMFs detected increased 4.1% in the Northeast (from 15,269 to 15,900), 2.1% in the Midwest (from 13,825 to 14,119), and 3.6% in the South (from 25,631 to 26,543). Subsequently, from 2022 to 2023, the number of deaths with IMFs detected decreased 3.2% in the Northeast (to 15,397), 7.8% in the Midwest (to 13,022), and 2.8% in the South (to 25,789). Declines were sharpest in the second half of 2023: compared with the second half of 2022, deaths with IMFs detected decreased 11.2% in the Northeast (8,245 to 7,323), 16.1% in the Midwest (7,160 to 6,008), and 10.5% in the South (13,492 to 12,077).

West. In the West Region, the percentage of overdose deaths with IMFs detected increased from 48.5% during Q1 2021 to 66.5% during Q2 2024. The number of overdose deaths with IMFs detected increased 19.5% from 2021 (5,949) to 2022 (7,112) and increased 33.9% from 2022 to 2023 (9,526), representing a 60.1% increase from 2021 to 2023. However, the number of deaths with IMFs detected decreased 13.0% in late 2023, from 2,588 in Q3 to 2,252 in Q4.

Overdose Deaths with Carfentanil Detected

Carfentanil was detected in 513 overdose deaths during January 2021–June 2024 (Figure 3). The number of overdose deaths with carfentanil detected was low during January 2021–June 2023 (≤30 per 6-month period). However,

FIGURE 1. Number of drug overdose deaths overall* and number and percentage of overdose deaths with illegally manufactured fentanyls† detected, by quarter of death§ — State Unintentional Drug Overdose Reporting System, United States,¶ January 2021–June 2024**



Abbreviations: IMFs = illegally manufactured fentanyls; Q = quarter; SUDORS = State Unintentional Drug Overdose Reporting System.

* A total of 251,089 overdose deaths occurred during January 2021–December 2023. Because not all overdose deaths that occurred during January–June 2024 have been entered into SUDORS, numbers of deaths overall and with IMFs detected during this time frame are underestimated and not presented. Percentages with IMFs detected during this time frame are restricted to deaths with toxicology information entered; these are expected to be accurate estimates of the percentages of overdose deaths with IMFs detected.

† Fentanyl was classified as likely illegally manufactured using toxicology, scene, and witness evidence. For the 9.9% of deaths with fentanyl detected that had insufficient evidence for classification as illegal or prescription, fentanyl was classified as illegal because the majority of fentanyl overdose deaths involve illegal fentanyl. All fentanyl analogs except pharmaceutical analogs (i.e., alfentanil, remifentanil, and sufentanil) were included as IMFs. Among deaths with IMFs detected, 98.4% had IMFs listed as a cause of death.

§ Q1: January–March; Q2: April–June; Q3: July–September, Q4: October–December.

¶ Forty-six jurisdictions: Alabama, Alaska, Arizona, Arkansas, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Vermont, Virginia, Washington, and West Virginia. For inclusion, jurisdictions were required to report ≥75% of deaths in their jurisdiction in each 6-month period during January 2021–December 2023.

** Preliminary data were downloaded from SUDORS on November 26, 2024; 2024 data in this figure were restricted to deaths with toxicology information entered and represent approximately 55% of expected overdose deaths.

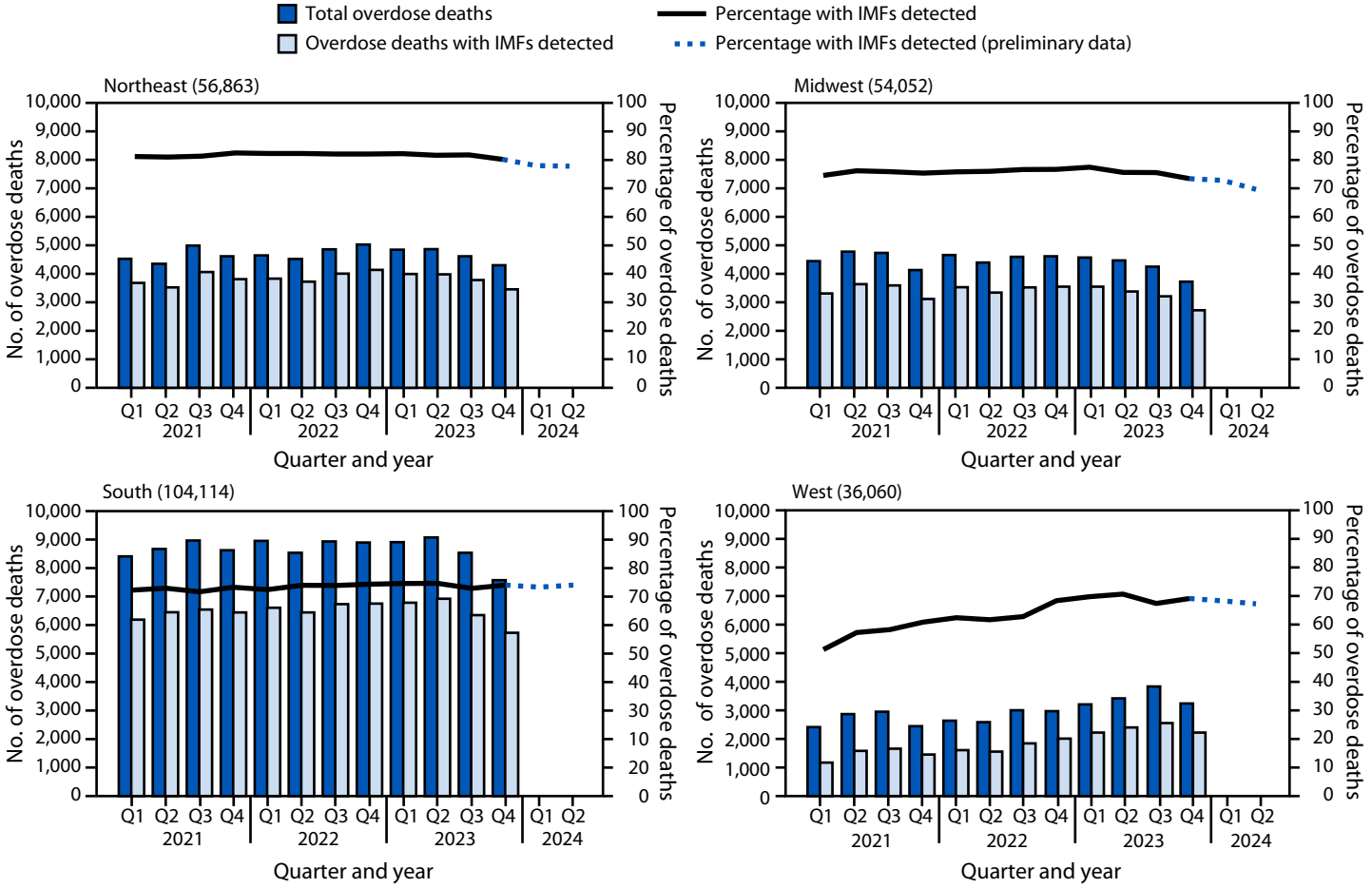
deaths with carfentanil detected increased 503.4% from 29 during January–June 2023 to 175 during July–December 2023, and increased at least another 36.0% to at least 238 during January–June 2024,§§§§ representing a total increase of 720.7% from the first half of 2023 to the first half of 2024. The average number of deaths with carfentanil detected sharply increased from 3.3 per month during January 2021–June 2023 to 34.4 per month during July 2023–June 2024. Among deaths with carfentanil detected during July 2023–June 2024, 86.9% had IMF co-detected. During January 2023–June 2024, carfentanil was detected in at least one overdose death in 37 states and at least 20 deaths in eight states, all east of the Mississippi River (Figure 3).

§§§§ The increase in the number of deaths with carfentanil detected from July–December 2023 to January–June 2024 is at least 36.0%. The actual increase is likely larger because not all overdose deaths that occurred during January–June 2024 had been entered in SUDORS at the time of publication.

Discussion

Although both the number of drug overdose deaths overall and the number with IMFs detected began to decline across the United States in late 2023, overdose deaths remain high. Percentages of overdose deaths with IMFs detected were stable (approximately 70%–80%) during 2021–2024, except in the West, where percentages increased from 48.5% to 66.5%. Despite declines, recent sharp increases in overdose deaths with carfentanil detected, although rare, highlight the ever-changing illegal drug supply and threaten progress in reducing overdose deaths.

FIGURE 2. Number of drug overdose deaths overall*,† and number and percentage of overdose deaths with illegally manufactured fentanyls§ detected, by U.S. Census Bureau region¶ and quarter of death — State Unintentional Drug Overdose Reporting System, United States,†† January 2021–June 2024§§**



Abbreviations: IMFs = illegally manufactured fentanyls; Q = quarter; SUDORS = State Unintentional Drug Overdose Reporting System.

* A total of 251,089 drug overdose deaths occurred during January 2021–December 2023. Sample sizes provided in each panel represent the number of overdose deaths in that region during January 2021–December 2023. The number of deaths should not be compared across regions because population size varies by region and not all jurisdictions in each region were included in the analysis.

† Because not all overdose deaths that occurred during January–June 2024 have been entered into SUDORS, numbers of deaths overall and with IMFs detected during this time frame are underestimated and not presented. Percentages with IMFs detected during this time frame are restricted to deaths with toxicology information entered; these are expected to be accurate estimates of the percentages of overdose deaths with IMFs detected.

§ Fentanyl was classified as likely illegally manufactured using toxicology, scene, and witness evidence. For the 9.9% of deaths with fentanyl detected that had insufficient evidence for classification as illegal or prescription, fentanyl was classified as illegal because the majority of fentanyl overdose deaths involve illegal fentanyl. All fentanyl analogs except pharmaceutical analogs (i.e., alfentanil, remifentanil, and sufentanil) were included as IMFs. Among deaths with IMFs detected, 98.4% had IMFs listed as a cause of death.

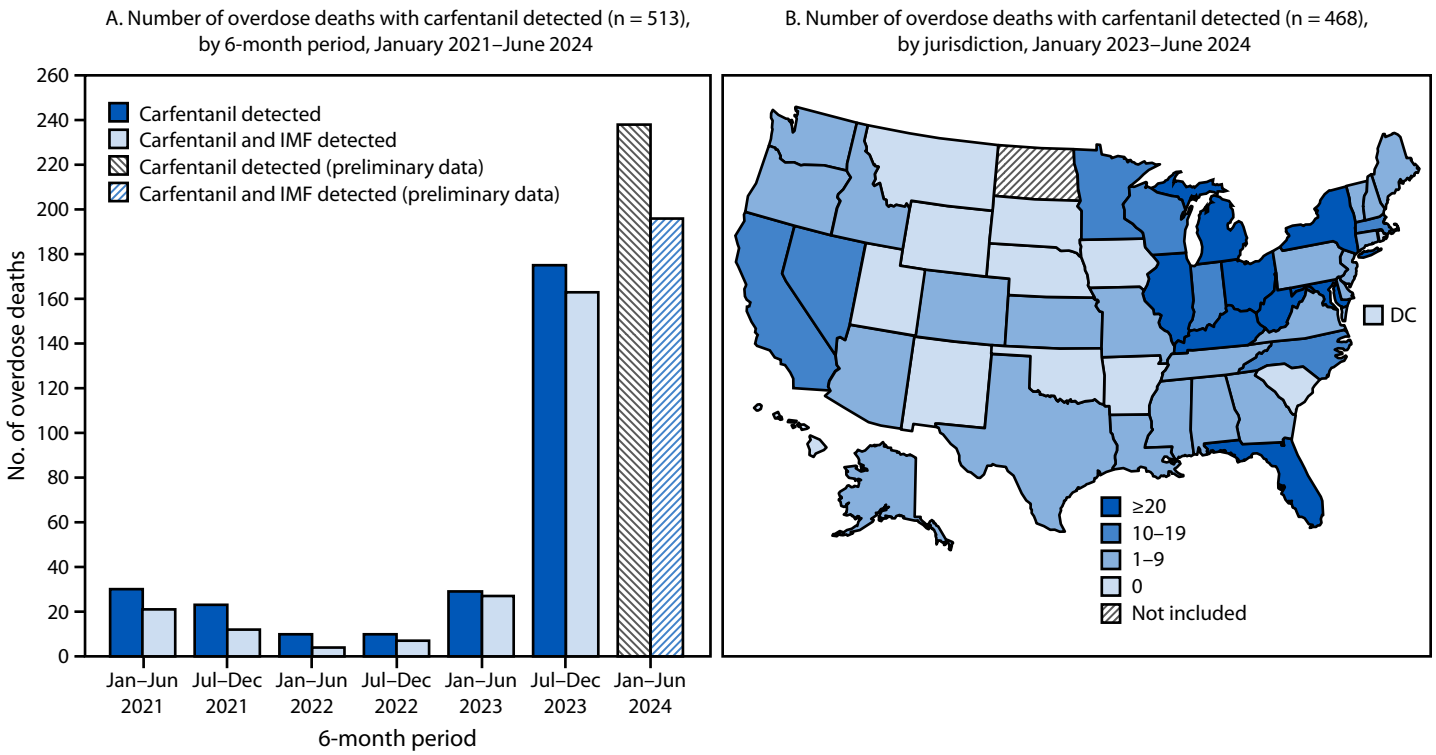
¶ https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf

** Q1: January–March, Q2: April–June, Q3: July–September, Q4: October–December.

†† Forty-six jurisdictions were included. *Northeast Region*: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. *Midwest Region*: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, Ohio, and South Dakota. *South Region*: Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Virginia, and West Virginia. *West Region*: Alaska, Arizona, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, and Washington. For inclusion, jurisdictions were required to report ≥75% of deaths in their jurisdiction in each 6-month period during January 2021–December 2023.

§§ Preliminary data were downloaded from SUDORS on November 26, 2024; 2024 data in this figure were restricted to deaths with toxicology information entered and represent approximately 55% of expected overdose deaths.

FIGURE 3. Number of drug overdose deaths with carfentanil detected,* by 6-month period of death (A)†,§ and jurisdiction (B)¶ — State Unintentional Drug Overdose Reporting System, United States, January 2021–June 2024,††**



Abbreviations: DC = District of Columbia; IMF = illegally manufactured fentanyl; SUDORS = State Unintentional Drug Overdose Reporting System.

* IMF includes illegally manufactured fentanyl but does not include illegally manufactured fentanyl analogs.

† For inclusion, jurisdictions were required to report ≥75% of overdose deaths in their jurisdiction in each 6-month period from January 2021 through December 2023. The percentage of overdose deaths reported for January–June 2024 was not calculated because data are preliminary and incomplete.

§ Forty-six jurisdictions: Alabama, Alaska, Arizona, Arkansas, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Vermont, Virginia, Washington, and West Virginia.

¶ Jurisdictions were included if they reported any drug overdose deaths to SUDORS during January 2023–June 2024. North Dakota was not included because it is not funded for SUDORS. For January–December 2023, all jurisdictions except one reported ≥90% of drug overdose deaths in their jurisdiction. For January–June 2024, the percentage of overdose deaths reported by jurisdiction was not calculated because data are preliminary and incomplete. Texas and Wyoming only include data on deaths during January–June 2024 per funding agreement.

** Data on drug overdose deaths that occurred in 2023 are final. Carfentanil was detected in overdose deaths in 25 states in 2023, totaling 210 deaths. Two states (Florida and West Virginia) reported ≥20 deaths, seven (Illinois, Indiana, Kentucky, Maryland, Michigan, New York, and Ohio) reported 10–19 deaths, and 16 (Alabama, California, Colorado, Connecticut, Georgia, Louisiana, Maine, Massachusetts, Minnesota, New Jersey, North Carolina, Pennsylvania, Tennessee, Virginia, Washington, and Wisconsin) reported one–nine deaths.

†† Overdose deaths that occurred during January–June 2024 are preliminary and incomplete because not all deaths that occurred during this time frame were entered at the time of analysis; these data are required to be reported into SUDORS by January 24, 2025. Preliminary data were downloaded from SUDORS on November 26, 2024, and represent approximately 85% of expected overdose deaths.

In the Northeast, Midwest, and South regions, the percentages of overdose deaths with IMFs detected was high (approximately 70%–80%) and stable from 2021 to June 2024, suggesting that IMFs have saturated the illegal drug supply (i.e., IMFs have become the dominant illegal opioid and have stabilized at a high level in the supply). Over the previous decade, the proliferation of potent rapid-acting IMFs that substantially increased fatal overdose risk and resulted in sharp rises in overdose deaths might have outpaced the impact of large-scale national, state, and local efforts to reduce drug overdoses (*1*–*3*). However, saturation of the drug supply with IMFs resulting in a more stable supply might now lead to lower overdose risk as persons using drugs might have increased tolerance¶¶¶¶ and might also be more aware that products contain IMFs. In addition, recent mixing of non-opioid drugs (e.g., xylazine) into the fentanyl supply might reduce fentanyl purity, thereby potentially decreasing overdose risk***** (*7*). In this context of suggested saturation of the drug supply

¶¶¶¶ https://nida.nih.gov/publications/drugfacts/understanding-drug-use-addiction

***** https://www.cfsre.org/images/content/reports/drug_checking/Fentanyl_Purity_Potency_and_Synthesis_August_2022.pdf

Summary

What is already known about this topic?

Approximately 70% of U.S. overdose deaths in 2023 were estimated to involve illegally manufactured fentanyls (IMFs). Local reports indicate reemergence of carfentanil, a fentanyl analog.

What is added by this report?

Overdose deaths overall and with IMFs detected began declining in 2023. Percentages of overdose deaths with IMFs detected were stable (approximately 70%–80%) during 2021–2024, except in the West where the percentage increased from 48.5% to 66.5%. Although rare, deaths with carfentanil detected increased approximately sevenfold, from 29 during January–June 2023 to 238 during January–June 2024; 37 states reported carfentanil detection.

What are the implications for public health practice?

Overdose prevention efforts that address widespread presence of IMFs, including carfentanil, and can rapidly adapt to other potent opioids in the drug supply, might result in lasting reductions in overdose deaths across the United States.

with IMFs and the potential for reduced overdose risk, more persons might be able to avoid or survive overdose and subsequently benefit from overdose prevention programs that have been implemented; this could be partially responsible for the decline in overdose deaths starting in late 2023. Continued and expanded implementation of these programs, including naloxone distribution and increasing access to treatments for substance use disorders,[†††††] might result in sustained and continued declines in drug overdose deaths. However, the potential for increases in overdoses remains if drugs more potent than fentanyl, including carfentanil, continue to adulterate the supply.

IMFs entered western U.S. drug markets later than other regions, likely because of challenges mixing fentanyl into the black tar heroin that was more common in the West (*1*). Recent increases in counterfeit pills containing IMFs, particularly in the West, have helped IMFs infiltrate the market, increasing overdose risk (*8*). Consistent with more recent proliferation into western markets, the West experienced recent large increases in the number and percentage of deaths with IMFs detected, approaching 70% in early 2024. If the West is similar to other regions where deaths plateaued when ≥70% of overdose deaths had IMFs detected, this region might soon experience a lasting plateau or decrease in overdose deaths as the drug supply approaches potential saturation with IMFs.

Although still rare, overdose deaths with carfentanil detected increased approximately sevenfold starting in mid-2023. Because carfentanil is 100 times more potent than fentanyl (*4*), overdose deaths could substantially increase if carfentanil further infiltrates the drug supply, as evidenced by previous outbreaks (*5*,*6*). The geographic spread (37 states) and substantial codetection with IMF (87%) are markedly different from what was observed during the emergence of carfentanil in overdose deaths during 2016–2017, in which outbreaks were localized, and <25% of deaths had fentanyl co-detected (*5*,*6*). The potential mixing of carfentanil into fentanyl products as an adulterant raises concern that its presence might be unknown to persons using drugs, reminiscent of the way that fentanyl was first introduced as an adulterant of heroin (*1*). Rigorous monitoring of carfentanil and other opioids more potent than fentanyl, such as some nitazene analogs that are currently rare but persistent in overdose deaths,[§§§§§] is warranted because of increased fatal overdose risk that could threaten recent progress in reducing overdose deaths.

To sustain reductions in overdose deaths, implementation of prevention efforts focused on the risks of IMFs, including carfentanil, is critical. These efforts include education about the risks of substance use and dangers of using pills that are not prescribed because they could be counterfeit and contain IMFs; drug checking services to help persons know what their drugs contain; increased access to naloxone for persons who use drugs and other laypersons, to ensure timely administration to reverse opioid overdoses; and messaging about additional risk reduction approaches (e.g., not using drugs while alone).[¶¶¶¶¶] In addition, fentanyl test strips can help persons who use drugs identify products that contain fentanyl but cannot distinguish carfentanil from fentanyl (*9*). Because carfentanil is a fentanyl analog, prevention efforts focused on IMFs overall will also be effective for reducing overdoses specifically involving carfentanil. However, given carfentanil's high potency, more doses of naloxone and faster overdose response might be required to prevent death (*10*). Combining these risk reduction efforts with efforts to reduce drug use, both through preventing drug use initiation and increasing access to treatments for substance use disorders (e.g., medications for opioid use disorder),[******] could lead to lasting decreases in overdose deaths that could withstand changes in the drug supply.

[†††††] https://www.hhs.gov/overdose-prevention/; https://www.cdc.gov/overdose-prevention/php/od2a/about.html; https://aspe.hhs.gov/sites/default/files/documents/facbce1704035fded1034192d148304d/buprenorphine-practice-guideline-early-impacts.pdf; https://www.cdc.gov/overdose-prevention/media/pdfs/OD2A-Case-Studies-State-and-Local-Integration-508.pdf

[§§§§§] https://www.cfsre.org/nps-discovery/trend-reports/nps-opioids/report/49?trend_type_id = 2; https://www.cdc.gov/overdose-prevention/data-research/facts-stats/sudors-dashboard-fatal-overdose-data.html

[¶¶¶¶¶] https://www.cdc.gov/overdose-prevention/prevention/index.html

[******] https://www.cdc.gov/overdose-prevention/treatment/index.html

Limitations

The findings in this report are subject to at least three limitations. First, depending on the analysis, 46 or 50 jurisdictions were included; thus, results might not be generalizable to the entire United States. Second, postmortem toxicology testing lacks standardization across and within jurisdictions and might result in differential carfentanil detection. Finally, 2024 data are preliminary; not all overdose deaths that occurred have been reported to SUDORS yet. These limitations likely underestimate overdose deaths with carfentanil detected. Therefore, the increases in deaths with carfentanil detected are likely larger than those presented in this report.

Implications for Public Health Practice

Reductions in unintentional and undetermined intent drug overdose deaths overall and with IMFs detected described in this report coincide with provisional estimates showing projected decreases in overdose deaths nationally in 2023 and into 2024. †††††† Importantly, most overdose deaths in the United States still have IMFs detected. In the West, deaths increased into 2023 as the percentage with IMFs detected approached levels similar to those seen in the rest of the country. Efforts focused on preventing deaths involving IMFs, including carfentanil and other analogs, such as maintaining and improving distribution of risk reduction tools, increasing access to and retention in treatment for substance use disorders, and preventing drug use initiation, might result in sustained decreases in overdose deaths. Finally, educational and response efforts that can rapidly adapt to the potential for increased distribution of drugs more potent than fentanyl, such as carfentanil, are needed and might avert or mitigate new increases in overdose deaths.

†††††† Inferences drawn from provisional data should be made with caution because the data are not final, and reported trends are subject to change.

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Corresponding author: Lauren J. Tanz, ltanz@cdc.gov.

[1]Division of Overdose Prevention, National Center for Injury Prevention and Control, CDC.

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Updated Recommendation for Universal Hepatitis B Vaccination in Adults Aged 19–59 Years — United States, 2024

Amy L. Sandul, DHSc[1]; Karina Rapposelli, MPH[1]; Melissa Nyendak, MD[1]; Min Kim, MD[1]

Summary

What is already known about this topic?

Vaccination is the principal means for preventing hepatitis B virus infection. Hepatitis B (HepB) vaccines are safe and effective. Advisory Committee on Immunization Practices recommendations include HepB vaccination of all adults aged 19–59 years, including pregnant persons. Pregnant persons may receive any HepB vaccine licensed for adults for which data are sufficient to evaluate vaccine-associated risks in pregnancy.

What is added by this report?

On September 11, 2024, the Food and Drug Administration approved updates to the package insert for Heplisav-B [HepB vaccine (recombinant), adjuvanted], Section 8.1 (Pregnancy) to include human data that do not suggest an increased risk for both major birth defects and miscarriage.

What are the implications for public health practice?

Providers can now administer Engerix-B, Heplisav-B, Recombivax HB, or Twinrix to pregnant persons needing HepB vaccination.

Hepatitis B (HepB) vaccines have demonstrated safety, immunogenicity, and efficacy during the past 4 decades (*1*,*2*). The Advisory Committee on Immunization Practices recommends universal HepB vaccination for adults aged 19–59 years, including pregnant persons, and adults aged ≥60 years with risk factors for hepatitis B. Adults aged ≥60 years without known risk factors for hepatitis B may also receive HepB vaccines (*2*).

On September 11, 2024, the Food and Drug Administration approved a request to update the labeling for Heplisav-B vaccine with new indications for use among pregnant persons (*3*,*4*). A postlicensure observational retrospective cohort study (DV2-HBV-28)* included 75 pregnancies with known outcomes, including 10 among persons who received Heplisav-B twice during the period from 28 days before conception through the end of pregnancy. Among 75 pregnant persons with exposure to Heplisav-B before or during pregnancy, 44 received Heplisav-B during the 28 days before conception, 24 during the first trimester, six during the second trimester, and one during the third trimester. No major birth defects were identified, and the risk for miscarriage was below the estimated background risk. These available data, primarily for persons who received 1 dose of Heplisav-B during the 28 days before conception, or during pregnancy, do not suggest an increased risk for both major birth defects and miscarriage. Approval by the Food and Drug Administration under section 351(a) of the Public Health Service Act† for Hepatitis B Vaccine (Recombinant), Adjuvanted (HEPLISAV-B), to update the package insert to include data from study DV2-HBV-28, allows for use of Heplisav-B to vaccinate pregnant persons needing HepB vaccination (*3*,*4*).

Recommendation

Providers should vaccinate pregnant persons needing HepB vaccination with Engerix-B,§ Heplisav-B,¶ Recombivax HB,** or Twinrix.††

* https://catalogues.ema.europa.eu/node/4205/methodological-aspects

† https://uscode.house.gov/view.xhtml?req=(title:42%20section:262%20edition:prelim)

§ https://www.fda.gov/media/119403/download

¶ https://www.fda.gov/media/108745/download

** https://www.fda.gov/files/vaccines%2C%20blood%20%26%20biologics/published/package-insert-recombivax-hb.pdf

†† https://gskpro.com/content/dam/global/hcpportal/en_US/Prescribing_Information/Twinrix/pdf/TWINRIX.PDF

Corresponding author: Amy L. Sandul, ASandul@cdc.gov.

[1]Division of Viral Hepatitis, National Center for HIV, Viral Hepatitis, STD, and TB Prevention, CDC.

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Notes from the Field

Rollout of Nirsevimab to Protect Infants and Young Children During the Respiratory Syncytial Virus Season — New York City, 2023–2024

Melanie S. Askari, PhD[1,2]; Kristin Oliver, MD[1]; Denise Benkel, MD[1]; Melissa Mickle-Hope, MPH[1]; Vincent Tam, MPH[1]; Marisa Langdon-Embry, MSc[1]; Georgia Elysee, MPH[1]; Bindy Crouch, MD[1]

Respiratory syncytial virus (RSV) infection is the leading cause of infant hospitalizations in the United States (*1*). During the 2023–24 RSV season, nirsevimab, a new, long-acting injectable human recombinant monoclonal antibody that prevents severe RSV infection in infants and young children became available. In August 2023, the Advisory Committee on Immunization Practices recommended administration of nirsevimab to infants aged 0–7 months and to infants and children aged 8–19 months with risk factors for severe RSV disease, shortly before the RSV season, or within the first week of life if born during October–March in most of the United States (*2*,*3*).

A nationwide shortage of nirsevimab in October 2023 affected the commercial market and the federally funded Vaccines for Children (VFC) program*,†; in response to the shortage, CDC issued a health advisory recommending prioritization of available nirsevimab doses for infants at highest risk for severe RSV disease, which necessitated a revised VFC allocation strategy (*4*). In New York City (NYC), approximately 75% of children are eligible for public, no-cost immunizations distributed by the NYC Health Department's VFC program. During the 2023–24 RSV season, approximately two thirds of NYC birthing hospitals§ were enrolled in VFC (26 of 38 birthing hospitals).

This analysis examined reported administration of nirsevimab doses, stratified by VFC eligibility status, to determine whether reported doses aligned with NYC's 2023–24 RSV season nirsevimab VFC distribution strategy. This strategy prioritized reaching VFC-eligible infants during the first week of life at birthing hospitals.

Investigation and Outcomes

Nirsevimab doses (15,521) administered during October 1, 2023–March 31, 2024, to infants and children aged 0–19 months, and reported to the NYC Citywide Immunization Registry, which serves as the immunization information system (IIS) for NYC, were characterized. Distribution of doses by patient demographic characteristics, period of administration in relation to the shortage, and facility setting was determined overall and by VFC eligibility status. Among those infants who were born during the recommended nirsevimab administration period for the 2023–24 RSV season (October 1, 2023–March 31, 2024) and who reportedly received nirsevimab, the proportions of infants and children who received nirsevimab within and after the first 7 days of life were determined overall and by VFC eligibility status. VFC eligibility status was determined based on IIS-reported insurance status; infants and children were considered VFC-eligible if they were enrolled in Medicaid, were covered by Child Health Plus B insurance or Section 317 Immunization Program funding, were uninsured or underinsured, or were Native American or Alaskan Native.¶ This activity was reviewed by CDC, deemed not research, and was conducted consistent with applicable federal law and CDC policy.**

Overall, 15,521 nirsevimab doses were administered to infants and children aged 0–19 months and reported to IIS in NYC shortly before or during the 2023–24 RSV season (Table). Among the subset of infants who were born during the recommended administration period for the 2023–24 RSV season (October 1, 2023–March 31, 2024) and who received nirsevimab (13,812), 45% received nirsevimab within the first 7 days of life, including 37% of VFC-eligible infants, 45% of non–VFC-eligible infants and children, and 61% of infants whose VFC eligibility was missing or unknown. Among VFC-eligible infants and children aged 0–19 months who received nirsevimab, 18% received nirsevimab at their birthing hospital, compared with 8% of non–VFC-eligible infants and children and 38% of those with missing or unknown VFC eligibility.

Preliminary Conclusions and Actions

NYC IIS data reflect administration of approximately 15,500 nirsevimab doses shortly before or during the 2023–24 RSV season, indicating that many infants and children aged 0–19 months were protected from severe RSV with this highly effective new RSV immunization (*5*). Approximately one half of nearly 14,000 nirsevimab doses reported to the NYC IIS administered to infants born shortly before or during the RSV season were administered within the first week of life. Entering the 2024–25 RSV season, an adequate supply of nirsevimab will be important to continue to protect infants and children.

* Since 1994, the VFC program, a federal entitlement program, has provided vaccines to eligible uninsured or underinsured persons aged ≤18 years.
† Although nirsevimab is not an active immunizing agent, it is authorized for administration as an immunization under the VFC program.
§ Birthing hospitals are defined as hospitals with labor and delivery units.
¶ https://www.cdc.gov/vaccines-for-children/hcp/program-eligibility/index.html
** 45 C.F.R. part 46, 21 C.F.R. part 56; 42 U.S.C. Sect. 241(d); 5 U.S.C. Sect. 552a; 44 U.S.C. Sect. 3501 et seq.

TABLE. Characteristics of infants and children aged 0–19 months who received nirsevimab immunizations and had their doses reported to the immunization information system, by Vaccines for Children program eligibility status — New York City,*,† 2023–24 respiratory syncytial virus season

Characteristic	No. (column %)			
	Overall N = 15,521	VFC-eligible n = 7,000	Non–VFC-eligible n = 5,678	VFC eligibility missing or unknown§ n = 2,843
Patient age, days				
Mean (SD)	**60.4 (82.5)**	72.5 (88.4)	58.4 (80.0)	34.7 (64.4)
Median (range)	**23.0 (0–605)**	36.0 (0–603)	21.0 (0–605)	3.0 (0–571)
Early life nirsevimab administration¶ (n = 13,812)				
Within first 7 days of life	**6,161 (44.6)**	2,231 (36.8)	2,276 (45.0)	1,654 (61.3)
After first 7 days of life	**7,651 (55.4)**	3,825 (63.2)	2,782 (55.0)	1,044 (38.7)
Age at administration, mos				
0–7	**15,123 (97.4)**	6,767 (96.7)	5,561 (97.9)	2,795 (98.3)
8–19	**398 (2.6)**	233 (3.3)	117 (2.1)	48 (1.7)
Period of administration**				
Before shortage	**471 (3.0)**	65 (0.9)	356 (6.3)	50 (1.8)
After shortage	**8,540 (55.0)**	3,359 (48.0)	3,621 (63.8)	1,560 (54.9)
Return to routine eligibility	**6,510 (41.9)**	3,576 (51.1)	1,701 (30.0)	1,233 (43.4)
Race and ethnicity††				
Asian or Pacific Islander	**2,539 (16.4)**	1,268 (18.1)	920 (16.2)	351 (12.3)
Black or African American	**1,964 (12.7)**	1,031 (14.7)	504 (8.9)	429 (15.1)
White	**5,053 (32.6)**	1,167 (16.7)	2,919 (51.4)	967 (34.0)
Hispanic or Latino	**5,048 (32.5)**	3,228 (46.1)	964 (17.0)	856 (30.1)
Other or unknown	**785 (5.1)**	273 (3.9)	307 (5.4)	205 (7.2)
Multiracial	**132 (0.9)**	33 (0.5)	64 (1.1)	35 (1.2)
Neighborhood poverty level				
<10% FPL, low poverty	**3,108 (20.0)**	731 (10.4)	1,783 (31.4)	594 (20.9)
≥10% to <20% FPL	**6,334 (40.8)**	2,951 (42.2)	2,333 (41.1)	1,050 (36.9)
≥20% to <30% FPL	**2,767 (17.8)**	1,598 (22.8)	711 (12.5)	458 (16.1)
≥30% to 100% FPL, very high poverty	**2,121 (13.7)**	1,330 (19.0)	325 (5.7)	466 (16.4)
Missing	**1,191 (7.7)**	390 (5.6)	526 (9.3)	275 (9.7)
Nirsevimab dose				
50 mg	**11,033 (71.1)**	4,486 (64.1)	4,109 (72.4)	2,438 (85.8)
100 mg	**4,488 (28.9)**	2,514 (35.9)	1,569 (27.6)	405 (14.2)
Facility setting				
FQHC or FQHC look-alike§§	**1,535 (9.9)**	1,279 (18.3)	149 (2.6)	107 (3.8)
Private ambulatory	**4,860 (31.3)**	1,461 (20.9)	2,647 (46.6)	752 (26.5)
Hospital ambulatory	**2,576 (16.6)**	1,667 (23.8)	690 (12.2)	219 (7.7)
Birthing hospital	**2,820 (18.2)**	1,269 (18.1)	470 (8.3)	1,081 (38.0)
Hospital pediatric ward, nonbirthing hospital	**357 (2.3)**	185 (2.6)	84 (1.5)	88 (3.1)
Hospital, other	**89 (0.6)**	79 (1.1)	8 (0.1)	2 (0.1)
Other nonprofit ambulatory	**86 (0.6)**	71 (1.0)	2 (0)	13 (0.5)
Hospital unknown, potential setting reporting error¶¶	**3,188 (20.5)**	979 (14.0)	1,628 (28.7)	581 (20.4)
Outside New York City	**10 (0.1)**	10 (0.1)	0 (—)	0 (—)

Abbreviations: FPL = federal poverty level; FQHC = federally qualified health center; RSV = respiratory syncytial virus; VFC = Vaccines for Children program.

* This study is a patient-level analysis. Analyses represent first doses only. In total, 181 nirsevimab second doses were not included.

† A total of 87 nirsevimab doses reported as administered to patients aged >19 months were excluded from this analysis, which was restricted to the age eligibility criteria recommended for nirsevimab by the Advisory Committee on Immunization Practices.

§ The substantial proportion of infants immunized in birthing hospitals with missing or unknown VFC eligibility might reflect uncertainty of newborn VFC eligibility status in these settings.

¶ Among infants born during the recommended nirsevimab administration period for the 2023–24 RSV season (i.e., October 1, 2023–March 31, 2024).

** Shortage periods were defined based on CDC notifications. Before shortage = October 1–22, 2023; after shortage = October 23, 2023–January 11, 2024; and return to routine eligibility = January 12–March 31, 2024.

†† Persons of Hispanic or Latino (Hispanic) origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

§§ An FQHC look-alike meets the FQHC program requirements but does not receive FQHC program funding.

¶¶ "Hospital unknown, potential setting reporting error" included adult settings or employee health and setting was likely misreported for these doses.

Summary

What is already known about this topic?

Nirsevimab, a monoclonal antibody that protects infants and young children against severe respiratory syncytial virus (RSV) infection through passive immunization, was approved for U.S. use during the 2023–24 RSV season.

What is added by this report?

Among New York City infants who were born during the recommended nirsevimab administration period for the 2023–24 RSV season (October 1, 2023–March 31, 2024) and who reportedly received nirsevimab, 37% of Vaccines for Children (VFC)–eligible and 45% of non–VFC-eligible infants received it within the first 7 days of life.

What are the implications for public health practice?

Ensuring birthing hospital VFC enrollment and establishing protocols to offer nirsevimab to eligible infants before hospital discharge might increase nirsevimab administration within the first week of life.

Further, the NYC Health Department continues to prioritize VFC enrollment for the remaining few birthing hospitals not currently enrolled. As of November 2024, a majority of NYC birthing hospitals were enrolled in VFC (31 of 38 birthing hospitals). Ensuring birthing hospital VFC enrollment and establishing protocols to offer nirsevimab to eligible infants before hospital discharge might increase nirsevimab administration within the first week of life.

Corresponding author: Melanie S. Askari, MAskari@cdc.gov.

[1]New York City Health Department, New York, New York; [2]Epidemic Intelligence Service, CDC.

All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. Bindy Crouch reports participation on the Advisory Committee on Immunization Practices' work group on respiratory syncytial virus vaccines for adult populations. No other potential conflicts of interest were disclosed.

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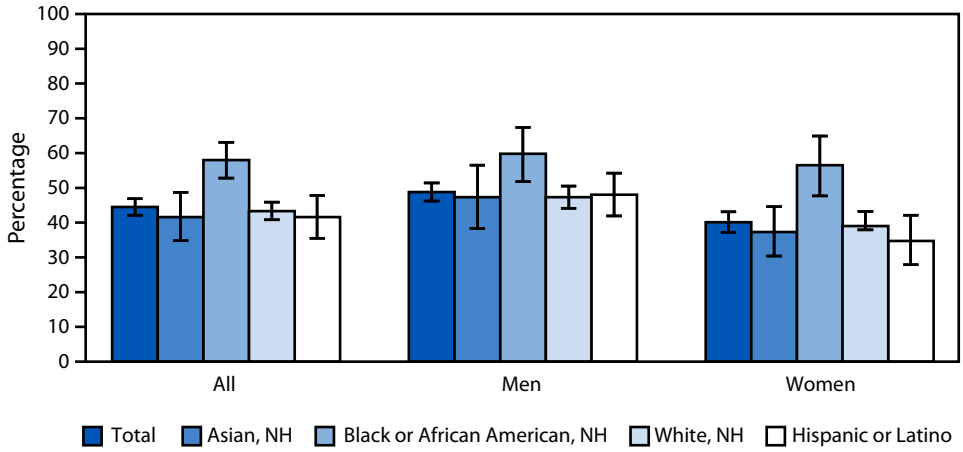
QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Age-Adjusted Percentage* of Adults Aged ≥18 Years with Hypertension,† by Sex and Race and Ethnicity — United States, August 2021–August 2023



Abbreviation: NH = non-Hispanic.
* Age-adjusted percentages are based on the 2000 U.S. Census Bureau standard population, using age groups 18–39, 40–59, and ≥60 years, with 95% CIs indicated by error bars.
† Hypertension is defined as systolic blood pressure ≥130 mm Hg or diastolic blood pressure ≥80 mm Hg, or currently taking medication to lower blood pressure.

During August 2021–August 2023, the age-adjusted percentage of adults with hypertension was 44.5% and was highest among non-Hispanic Black or African American (Black) adults (58.0%). Hypertension was also highest for Black adults among both men and women. In addition, hypertension was higher among non-Hispanic Asian, non-Hispanic White, and Hispanic or Latino men compared with women.

Supplementary Table: https://stacks.cdc.gov/view/cdc/170362

Source: National Center for Health Statistics, National Health and Nutrition Examination Survey, August 2021–August 2023. https://www.cdc.gov/nchs/nhanes/index.htm

Reported by: Cheryl D. Fryar, MSPH, clf9@cdc.gov; Brian K. Kit, MD.

For more information on this topic, CDC recommends the following link: https://www.cdc.gov/high-blood-pressure/about/index.html

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