

## Infant Mortality in the United States, 2023: Data From the Period Linked Birth/Infant Death File

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### Abstract

**Objectives**—This report presents final 2023 infant mortality statistics by age at death, maternal race and Hispanic origin, maternal age, gestational age, leading causes of death, and maternal state of residence. Trends in infant mortality are also examined.

**Methods**—Descriptive tabulations of data are presented and interpreted for infant deaths and infant mortality rates using the 2023 period linked birth/infant death file. The linked birth/infant death file is based on birth and death certificates registered in all 50 states and the District of Columbia.

**Results**—A total of 20,162 infant deaths were reported in the United States in 2023, down 2% from 2022. The U.S. infant mortality rate was 5.61 infant deaths per 1,000 live births, unchanged from the rate in 2022. Changes in the neonatal mortality rate from 3.59 in 2022 to 3.65 in 2023, and in the postneonatal mortality rate from 2.02 to 1.96, were not significant. Changes in mortality rates for infants by maternal race and Hispanic-origin group were not significant; among Hispanic-origin subgroups, rates increased for infants of Mexican women in 2023 compared with 2022. Infants of Black non-Hispanic women had the highest mortality rate (10.93) in 2023, followed by infants of American Indian and Alaska Native non-Hispanic (9.20) and Native Hawaiian or Other Pacific Islander non-Hispanic (8.21), Hispanic (5.03), White non-Hispanic (4.48), and Asian non-Hispanic (3.44) women. The mortality rate decreased from 2022 to 2023 for infants born at 41 weeks of gestation (1.73 to 1.46) but were essentially unchanged for other gestational age categories. The five leading causes of infant death in 2023 were the same as in 2022. Infant mortality rates by state for 2023 ranged from a low of 2.93 in New Hampshire to a high of 8.94 in Mississippi.

**Keywords:** maternal and infant characteristics • vital statistics • National Vital Statistics System

### Introduction

This report presents infant mortality statistics based on data from the 2023 period linked birth/infant death file. Infant mortality and mortality rates are described by age at death, maternal race and Hispanic origin, maternal age, gestational age, leading causes of death, and maternal state of residence. Infant mortality trends are also presented by selected characteristics. In the linked file, information from the death certificate is linked to information from the birth certificate for each infant younger than age 1 year who died in the 50 states, the District of Columbia, Puerto Rico, or Guam during 2023 (1). The purpose of the linkage is to use variables available from the birth certificate to conduct more detailed analyses of infant mortality patterns (2,3). The linked birth/infant death data set also is the preferred source for examining infant mortality by race and Hispanic origin. Infant mortality rates by race and Hispanic origin, based on maternal race and Hispanic origin, are more accurately measured from the birth certificate compared with the death certificate.

For 2023, linked birth/infant death data are not available for American Samoa, Commonwealth of the Northern Marianas, and U.S. Virgin Islands. Some rates calculated from the mortality file differ from those published using the linked file. More details can be found elsewhere (1).

### Methods

Data shown in this report are based on birth and infant death certificates registered in all states, the District of Columbia, Puerto Rico, and Guam. As part of the Vital Statistics Cooperative Program, each state provides matching birth and death certificate numbers for each infant younger than age 1 year who died during 2023 to the National Center for Health Statistics. Further discussion of the process of linking births and deaths occurring in different states and file production can be found in the Methodology section of the “User Guide to the 2023

Period/2022 Cohort Linked Birth/Infant Death Public Use File” (1).

The period linked file for 2017 marked the first data year for which the linked birth data for infant deaths for all 50 states and the District of Columbia were based on the 2003 revision of the U.S. Standard Certificate of Live Birth (4) and, also, the first year for which national data on race and Hispanic-origin categories based on 1997 Office of Management and Budget standards became available (5).

In 2023, 98.8% of all infant death records were successfully linked to their corresponding birth records. These records were weighted to adjust for the 1.2% of infant death records that were not linked to their corresponding birth certificates (1) (Technical Notes).

Information for age and race of mother is imputed if it is not reported on the birth certificate. In 2023, race of mother was imputed for 8.1% of births; mother’s age was imputed for 0.02% of births (2,3).

All race and Hispanic-origin data are based on single-race reporting and are consistent with the 1997 Office of Management and Budget standards and differ from the bridged-race categories shown in previous reports (5). Maternal race and Hispanic-origin categories presented are American Indian and Alaska Native non-Hispanic (subsequently, American Indian and Alaska Native), Asian non-Hispanic (subsequently, Asian), Black non-Hispanic (subsequently, Black), Native Hawaiian or Other Pacific Islander non-Hispanic (subsequently, Native Hawaiian or Other Pacific Islander), White non-Hispanic (subsequently, White), and Hispanic. Race and Hispanic origin are reported separately on the birth certificate. Data are shown in most cases for five specified Hispanic groups: Central and South American, Cuban, Dominican, Mexican, and Puerto Rican. Additional details on Hispanic origin are available elsewhere (3). Comparisons between 2023 and 2022 by race and Hispanic origin are made in this report. The 2003 revision of the U.S. Standard Certificate of Live Birth allows the reporting of five race categories for each parent (6)—either alone, as in single race, or in combination, as in more than one race or multiple races—in accordance with the 1997 revised Office of Management and Budget standards (5). Further details on race reporting are available elsewhere (3).

Cause-of-death statistics are classified in accordance with the *International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD–10)* (7) (Technical Notes).

## Data by maternal and infant characteristics

This report presents descriptive tabulations of infant mortality data by a variety of maternal and infant characteristics. These tabulations are useful for understanding the basic relationships between risk factors and infant mortality, unadjusted for the possible effects of other variables. This report also presents several key risk factors for infant mortality: age at death, maternal race and Hispanic origin, maternal age, gestational age, leading causes of infant death, and maternal state of residence. For brevity, additional selected risk factors (sex, birthweight, plurality, and nativity [mother’s place of birth]) are presented in tables but not discussed in this report.

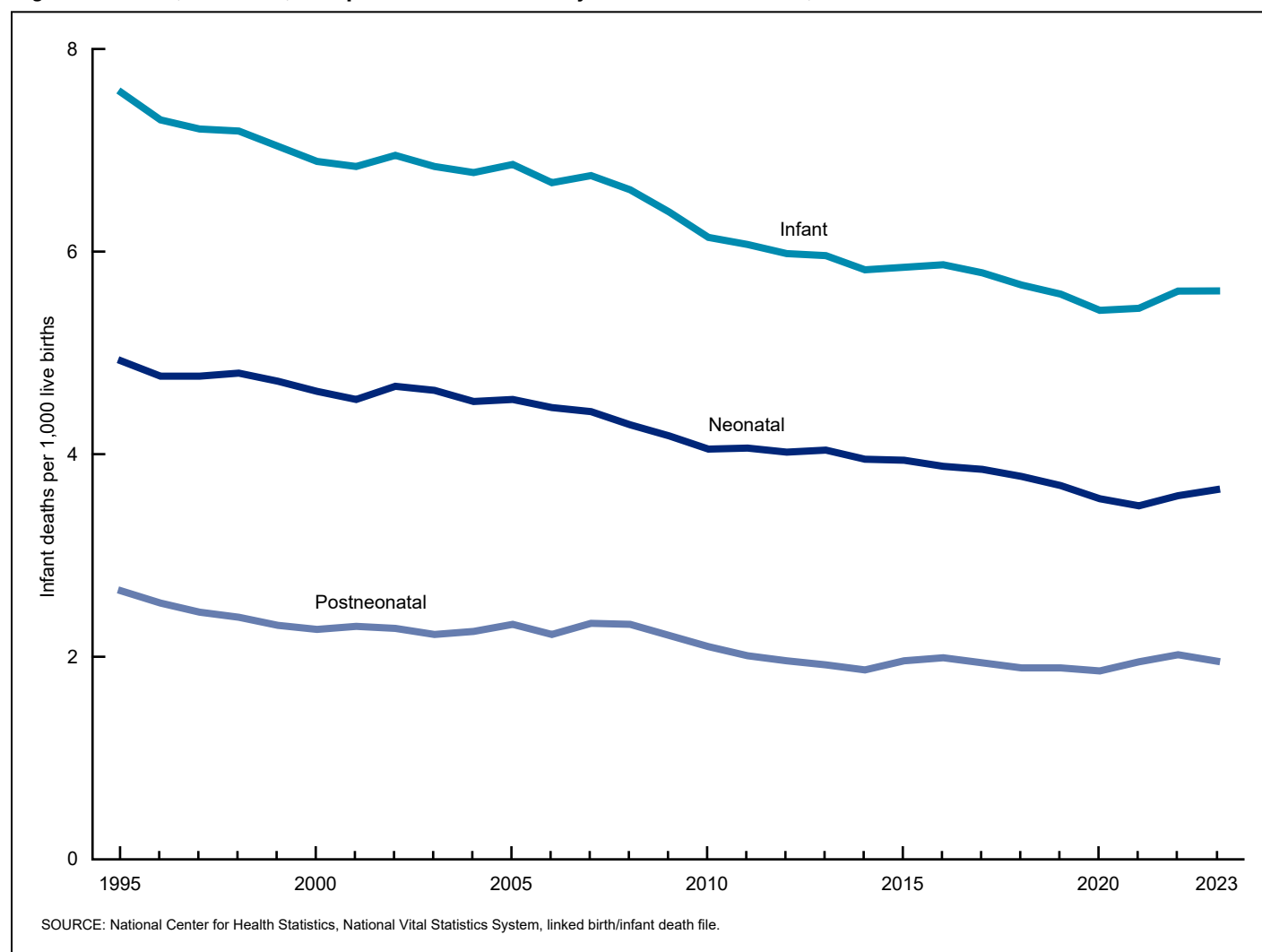
**Race and Hispanic origin**—Infant mortality rates are presented by race and Hispanic origin of the mother. The linked file is useful for computing accurate infant mortality rates by these characteristics because the race and Hispanic origin of the mother from the birth certificate are used in both the numerator and denominator of the infant mortality rate. In contrast, for rates based on the vital statistics mortality file, race information for the denominator is the race of the mother as reported on the birth certificate, while race information for the numerator is the race of the decedent as reported on the death certificate (2,3,8). More detail on the reliability of race and Hispanic-origin data from the linked file compared with the mortality file is available elsewhere (8).

**Statistical significance**—Statements in the text have been tested for statistical significance, and a statement that a given infant mortality rate is higher or lower than another rate indicates that the rates are significantly different using a two-tailed *z* test at the alpha level of 0.05. Comparisons between state rates and the U.S. rate take into account each state’s contribution to the U.S. rate. As a result, each state rate is compared with a unique U.S. rate independent of the state’s contribution to the total U.S. rate. Information on the methods used to test for statistical significance and suppression standards, as well as information on differences between period and cohort data, the weighting of the linked file, maternal age, period of gestation, birthweight, and cause-of-death classification is also available (1) (Technical Notes).

## Results

### Trends in infant mortality and infant age at death

- In 2023, 20,162 infant deaths were reported in the United States, a decrease of 2% from 2022 (20,577) (Figure 1, Table 1). The infant mortality rate was 5.61 deaths per 1,000 live births in 2023, unchanged from the 2022 rate; the increase in the rate from 2021 (5.44) to 2022 was the first since the increase from 2001 (6.84) to 2002 (6.95).
- The U.S. infant mortality rate has generally trended downward since 1995 (the first year that the period linked birth/infant death file was available) and is down 19% since 2002.
- The 2023 neonatal mortality rate (infant deaths at less than 28 days) of 3.65 was not significantly different than the rate in 2022 (3.59); the increase in the rate from 2021 (3.49) to 2022 was the first since the increase from 2001 (4.54) to 2002 (4.67). The neonatal mortality rate has generally declined since 1995 and decreased 22% since the last increase in 2002.
- The 2023 postneonatal mortality rate (infant deaths at 28 days or more) of 1.96 was essentially unchanged from the rate in 2022 (2.02). The rate increased from 2021 (1.95) to 2022. The postneonatal mortality rate has also generally declined since 1995 and decreased 14% since 2002 (2.28).

**Figure 1. Infant, neonatal, and postneonatal mortality rates: United States, 1995–2023**

## Race and Hispanic origin

- Mortality rates did not change significantly from 2022 to 2023 for infants of women of any of the race and Hispanic-origin groups: American Indian and Alaska Native (9.06 infant deaths per 1,000 live births in 2022 to 9.20 in 2023), Asian (3.51 to 3.44), Black (10.90 to 10.93), Native Hawaiian and Other Pacific Islander (8.50 to 8.21), White (4.52 to 4.48), and Hispanic (4.89 to 5.03) (Tables 1 and 2, Figure 2).
- Among Hispanic-origin subgroups, the mortality rate for infants of Mexican women increased from 4.79 to 5.12 from 2022 to 2023; increases in mortality rates for infants of Central and South American (4.36 to 4.59) and Puerto Rican (6.32 to 6.43) women were not significant. Declines in mortality rates for infants of Cuban (3.94 to 3.77) and Dominican (4.74 to 4.59) women from 2022 to 2023 were not significant.
- In 2023, infant mortality continued to vary by race: infants of Black women had the highest mortality rate (10.93), followed by infants of American Indian and Alaska Native and Native Hawaiian or Other Pacific Islander (9.20 and

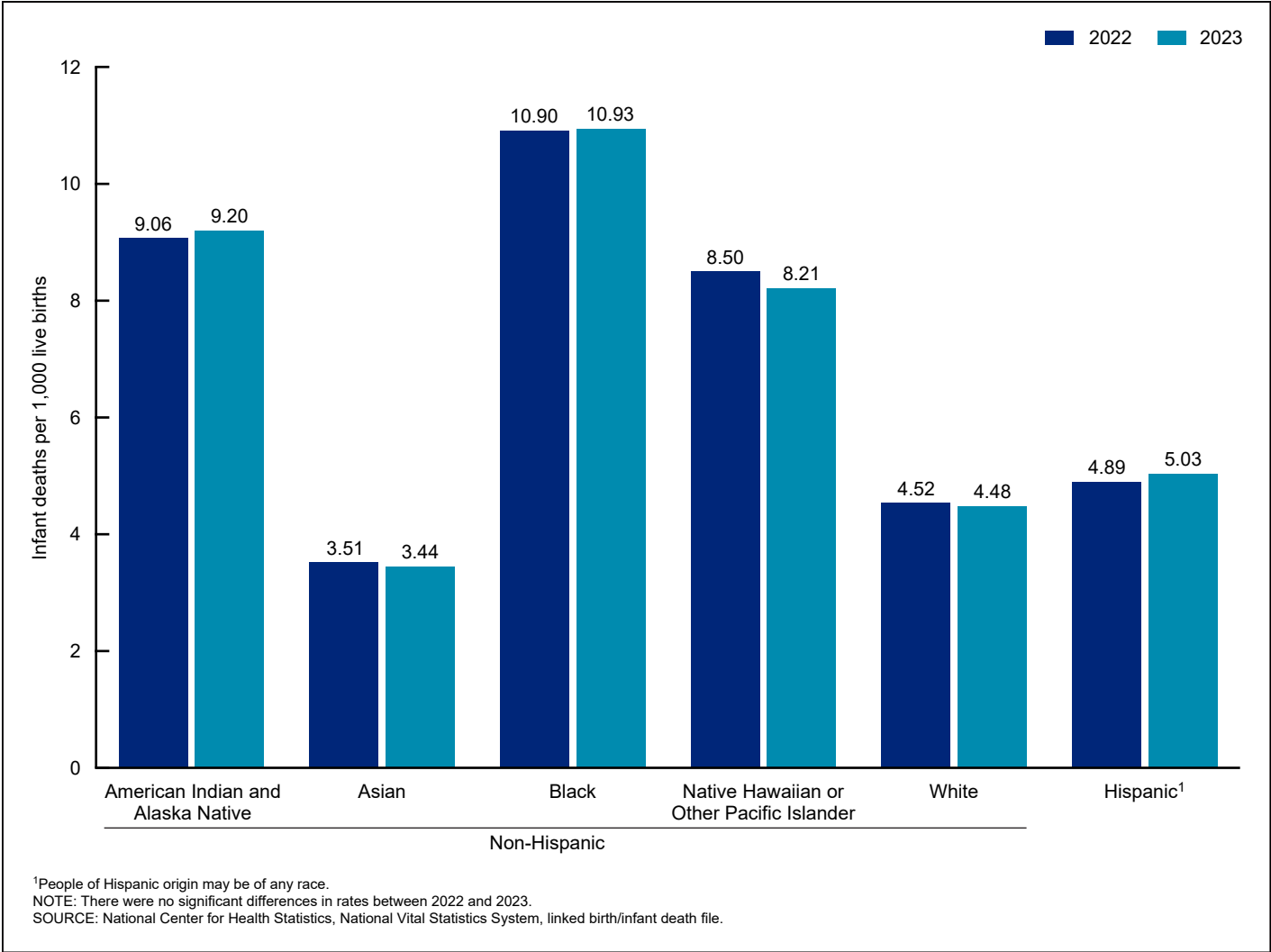
8.21, respectively), Hispanic (5.03), White (4.48), and Asian (3.44) women.

- Infants of Black women also had the highest neonatal mortality rate in 2023 (6.63) compared with infants of the other race and Hispanic-origin groups; the lowest mortality rate was for infants of Asian women (2.51) (Table 2).
- In 2023, postneonatal mortality rates were higher for infants of American Indian and Alaska Native (4.40), Black (4.30), and Native Hawaiian or Other Pacific Islander (3.26) women than for infants of White (1.61), Hispanic (1.47), and Asian (0.92) women.
- Among Hispanic-origin subgroups in 2023, the mortality rate for infants of Puerto Rican women (6.43) was higher than that of infants of Mexican (5.12), Dominican (4.59), Central and South American (4.59), and Cuban (3.77) women.

## Maternal age

- From 2022 to 2023, no significant changes in mortality rates for infants of women of any age group were seen (Figure 3, Table 2).

Figure 2. Infant mortality rate, by maternal race and Hispanic origin: United States, 2022 and 2023



- Nonsignificant increases in mortality rates were seen for infants of females younger than age 15 (14.25 infant deaths per 1,000 live births to 20.95) and ages 15–19 (9.86 to 10.44), and for infants of women ages 20–24 (7.13 to 7.23) and 40 and older (6.73 to 6.77).
- Decreases in mortality rates for infants of women ages 25–29 (5.37 to 5.24) and 35–39 (4.99 to 4.94) were not significant. The rate for infants of women ages 30–34 was unchanged from 2022 to 2023 at 4.59.
- In 2023, mortality rates were highest for infants of females younger than 15 (20.95), decreased to a low of 4.59 for infants of women ages 30–34, and then increased to 6.77 for infants of women age 40 and older.

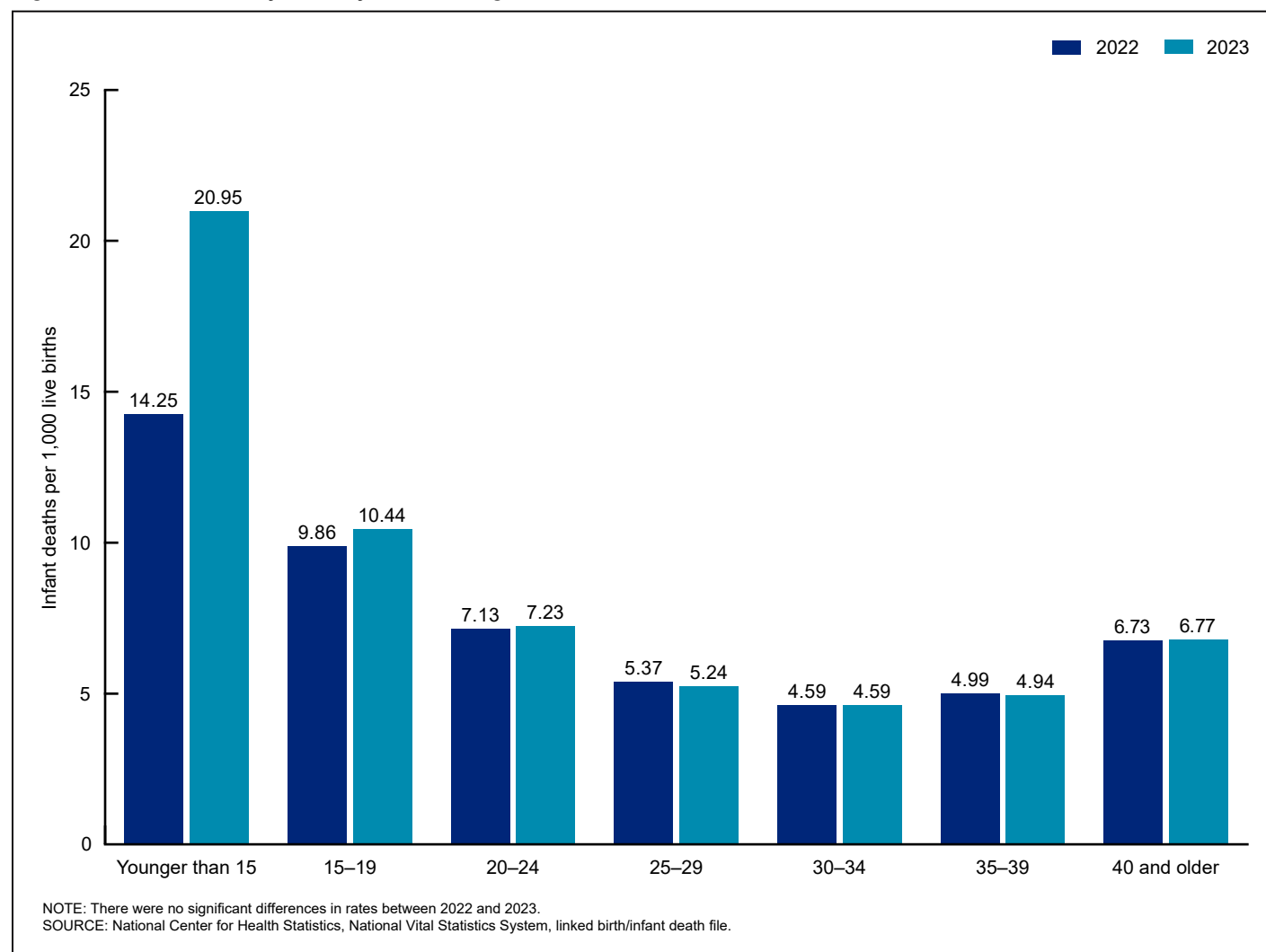
Gestational age

- The mortality rate declined for infants born at 41 weeks (1.73 infant deaths per 1,000 live births to 1.46) but did not change significantly for the other gestational age categories from 2022 to 2023: preterm (less than 37 weeks of gestation) (34.78 to 34.74), early preterm (less than 34 weeks) (107.94 to 107.87), late preterm (34–36 weeks)

- (8.29 to 8.31), term (37–41 weeks) (2.18 to 2.16), and post-term (42 weeks or more) (4.23 to 3.66) (9) (Table, Table 2).
- In 2023, almost two-thirds of all infant deaths (65%) occurred among infants born preterm (less than 37 weeks of gestation), which was unchanged from 2022 (9).

Leading causes of infant death

- In 2023, the five leading causes of all infant deaths were the same as those in 2022: congenital malformations (20.0% of infant deaths), disorders related to short gestation and low birth weight (14.5%), sudden infant death syndrome (SIDS) (7.2%), unintentional injuries (6.4%), and maternal complications (5.7%) (Table 3).
- From 2022 to 2023, no significant changes in infant mortality rates were seen for the five leading causes of death: congenital malformations (from 109.2 infant deaths per 100,000 live births to 112.1), disorders related to short gestation and low birth weight (78.6 to 81.4), SIDS (41.7 to 40.2), unintentional injuries (36.8 to 35.8), and maternal complications (33.1 to 31.9).

**Figure 3. Infant mortality rate, by maternal age: United States, 2022 and 2023****Table. Infant mortality rate, by gestational age: United States, 2015–2023**

Year	Less than 32 weeks	32–33 weeks	34–36 weeks	37–41 weeks	42 weeks or more
Deaths per 1,000 live births					
2023.....	174.28	21.04	8.31	2.16	3.66
2022.....	175.18	21.05	8.29	2.18	4.23
2021.....	167.39	19.35	8.11	2.08	3.79
2020.....	175.88	20.11	7.92	2.04	4.17
2019.....	180.40	19.21	8.21	2.03	5.72
2018.....	185.79	21.95	8.21	2.05	5.39
2017.....	187.56	20.50	8.50	2.10	3.98
2016.....	190.15	20.12	8.65	2.19	4.31
2015.....	193.54	20.79	8.76	2.17	4.20

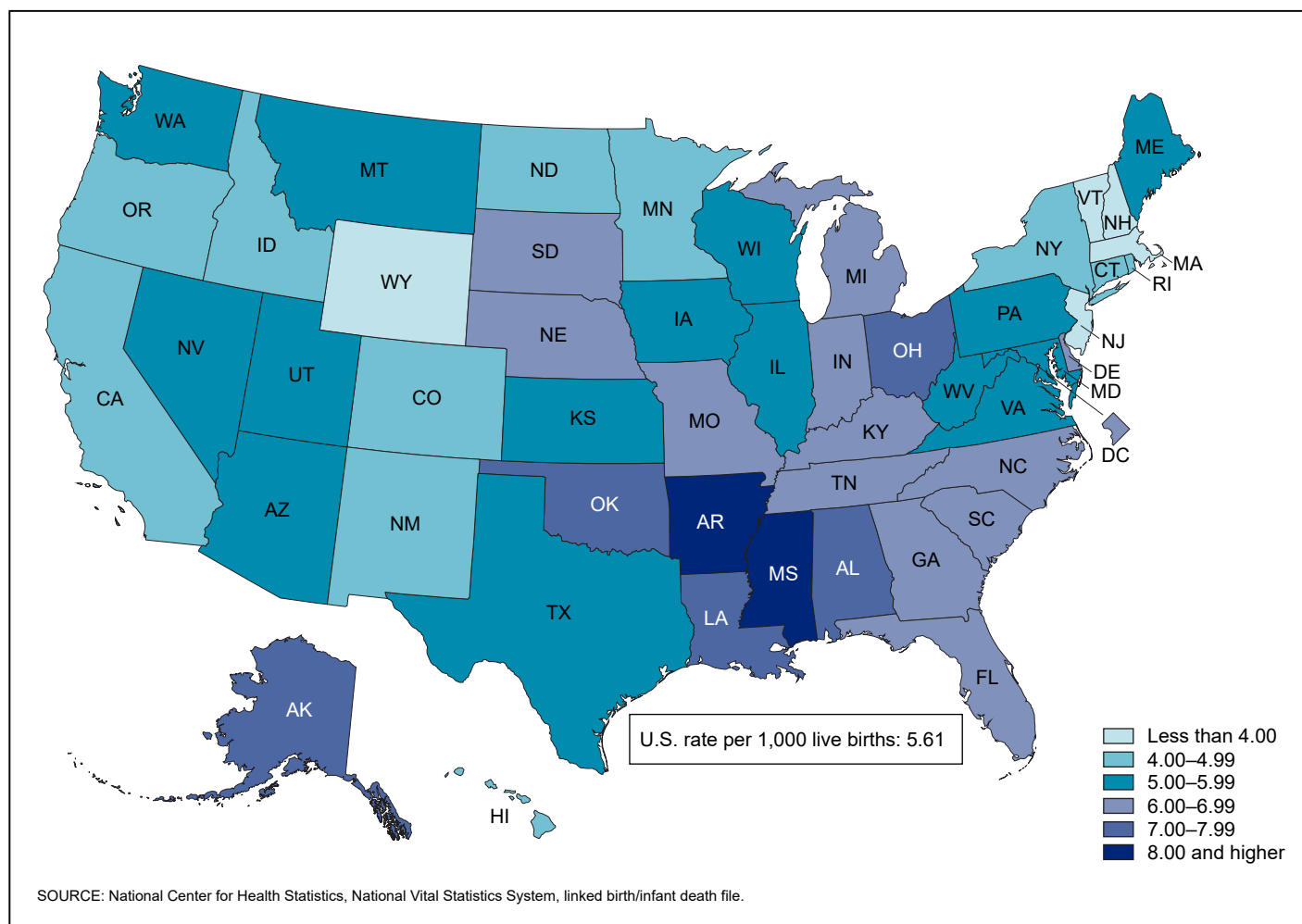
SOURCE: National Center for Health Statistics, National Vital Statistics System, linked birth/infant death file.

- Congenital malformations was the leading cause of death for infants of women for most race and Hispanic-origin groups: American Indian and Alaska Native (134.3), Asian (69.1), Native Hawaiian and Other Pacific Islander (148.3), White (102.2), and Hispanic (119.6) in 2023 (Table 4).

- In 2023, disorders related to short gestation and low birth weight was the leading cause of death for infants of Black women (201.0).

### Infant mortality by state

- By state, infant mortality ranged from a low of 2.93 infant deaths per 1,000 births in New Hampshire to a high of 8.94 in Mississippi (Figure 4, Table 5).
- Thirteen states had infant mortality rates significantly lower than the national infant mortality rate: California, Colorado, Connecticut, Idaho, Massachusetts, Minnesota, New Hampshire, New Jersey, New Mexico, New York, Oregon, Vermont, and Washington.
- Fourteen states had infant mortality rates significantly higher than the U.S. infant mortality rate: Alabama, Arkansas, Florida, Georgia, Indiana, Kentucky, Louisiana, Michigan, Mississippi, North Carolina, Ohio, Oklahoma, South Carolina, and Tennessee.

**Figure 4. Infant mortality rate, by state: United States, 2023**

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**Table 1. Live births; infant, neonatal, and postneonatal deaths; and mortality rate: United States, 1995–2023, and by maternal race and Hispanic origin, 2017–2023**

Race and Hispanic origin and year	Number				Deaths per 1,000 live births		
	Live births	Infant deaths	Neonatal deaths	Postneonatal deaths	Infant	Neonatal	Postneonatal
All race and Hispanic-origin groups							
2023.....	3,596,017	20,162	13,113	7,049	5.61	3.65	1.96
2022.....	3,667,758	20,577	13,158	7,419	5.61	3.59	2.02
2021.....	3,664,292	19,928	12,797	7,131	5.44	3.49	1.95
2020.....	3,613,647	19,578	12,866	6,712	5.42	3.56	1.86
2019.....	3,747,540	20,927	13,834	7,093	5.58	3.69	1.89
2018.....	3,791,712	21,498	14,329	7,169	5.67	3.78	1.89
2017.....	3,855,500	22,341	14,844	7,497	5.79	3.85	1.94
2016.....	3,945,875	23,157	15,303	7,854	5.87	3.88	1.99
2015.....	3,978,497	23,458	15,672	7,786	5.90	3.94	1.96
2014.....	3,988,076	23,211	15,737	7,474	5.82	3.95	1.87
2013.....	3,932,181	23,446	15,893	7,553	5.96	4.04	1.92
2012.....	3,952,841	23,654	15,887	7,767	5.98	4.02	1.96
2011.....	3,953,590	24,001	16,065	7,936	6.07	4.06	2.01
2010.....	3,999,386	24,572	16,193	8,379	6.14	4.05	2.10
2009.....	4,130,665	26,408	17,261	9,148	6.39	4.18	2.21
2008.....	4,247,726	28,075	18,238	9,837	6.61	4.29	2.32
2007.....	4,316,233	29,153	19,094	10,059	6.75	4.42	2.33
2006.....	4,265,593	28,509	19,041	9,468	6.68	4.46	2.22
2005.....	4,138,573	28,384	18,782	9,602	6.86	4.54	2.32
2004.....	4,112,055	27,860	18,602	9,258	6.78	4.52	2.25
2003.....	4,090,007	27,995	18,935	9,060	6.84	4.63	2.22
2002.....	4,021,825	27,970	18,791	9,179	6.95	4.67	2.28
2001.....	4,026,036	27,523	18,275	9,248	6.84	4.54	2.30
2000.....	4,058,882	27,961	18,733	9,227	6.89	4.62	2.27
1999.....	3,959,417	27,865	18,701	9,164	7.04	4.72	2.31
1998.....	3,941,553	28,325	18,915	9,410	7.19	4.80	2.39
1997.....	3,880,894	27,968	18,507	9,461	7.21	4.77	2.44
1996.....	3,891,494	28,419	18,556	9,863	7.30	4.77	2.53
1995.....	3,899,589	29,505	19,186	10,319	7.57	4.92	2.65
Non-Hispanic, single race							
American Indian and Alaska Native:							
2023.....	24,571	226	117	108	9.20	4.76	4.40
2022.....	25,721	233	135	98	9.06	5.25	3.81
2021.....	26,124	195	100	96	7.46	3.83	3.67
2020.....	26,813	206	102	104	7.68	3.80	3.88
2019.....	28,450	224	114	110	7.87	4.01	3.87
2018.....	29,092	237	120	117	8.15	4.12	4.02
2017.....	29,957	276	143	132	9.21	4.77	4.41
Asian:							
2023.....	215,738	742	542	199	3.44	2.51	0.92
2022.....	218,994	768	542	225	3.51	2.47	1.03
2021.....	213,813	788	594	193	3.69	2.78	0.90
2020.....	219,068	688	503	185	3.14	2.30	0.84
2019.....	238,769	806	602	204	3.38	2.52	0.85
2018.....	240,798	874	643	231	3.63	2.67	0.96
2017.....	249,250	943	675	268	3.78	2.71	1.08
Black:							
2023.....	491,494	5,374	3,260	2,114	10.93	6.63	4.30
2022.....	511,439	5,573	3,296	2,277	10.90	6.44	4.45
2021.....	517,889	5,463	3,291	2,172	10.55	6.35	4.19
2020.....	529,811	5,501	3,472	2,028	10.38	6.55	3.83
2019.....	548,075	5,821	3,754	2,067	10.62	6.85	3.77
2018.....	552,029	5,933	3,897	2,037	10.75	7.06	3.69
2017.....	560,715	6,152	4,012	2,140	10.97	7.16	3.82



**Table 1. Live births; infant, neonatal, and postneonatal deaths; and mortality rate: United States, 1995–2023, and by maternal race and Hispanic origin, 2017–2023—Con.**

Race and Hispanic origin and year	Number				Deaths per 1,000 live births		
	Live births	Infant deaths	Neonatal deaths	Postneonatal deaths	Infant	Neonatal	Postneonatal
Non-Hispanic, single race—Con.							
Native Hawaiian or Other Pacific Islander:							
2023 .....	10,115	83	50	33	8.21	4.94	3.26
2022 .....	10,122	86	48	38	8.50	4.74	3.75
2021 .....	9,531	74	41	32	7.76	4.30	3.36
2020 .....	9,626	69	41	27	7.17	4.26	2.80
2019 .....	9,770	80	49	31	8.19	5.02	3.17
2018 .....	9,476	89	51	38	9.39	5.38	4.01
2017 .....	9,426	72	36	36	7.64	3.82	3.82
White:							
2023 .....	1,787,051	8,008	5,127	2,881	4.48	2.87	1.61
2022 .....	1,840,739	8,324	5,318	3,006	4.52	2.89	1.63
2021 .....	1,887,656	8,236	5,251	2,984	4.36	2.78	1.58
2020 .....	1,843,432	8,115	5,290	2,825	4.40	2.87	1.53
2019 .....	1,915,912	8,603	5,589	3,014	4.49	2.92	1.57
2018 .....	1,956,413	9,059	5,873	3,186	4.63	3.00	1.63
2017 .....	1,992,461	9,306	6,061	3,246	4.67	3.04	1.63
Hispanic							
2023 .....	945,200	4,750	3,356	1,394	5.03	3.55	1.47
2022 .....	937,421	4,581	3,138	1,442	4.89	3.35	1.54
2021 .....	885,916	4,246	2,899	1,347	4.79	3.27	1.52
2020 .....	866,713	4,063	2,828	1,235	4.69	3.26	1.42
2019 .....	886,467	4,462	3,091	1,371	5.03	3.49	1.55
2018 .....	886,210	4,303	3,036	1,267	4.86	3.43	1.43
2017 .....	898,764	4,583	3,198	1,383	5.10	3.56	1.54
Central and South American:							
2023 .....	208,618	958	697	261	4.59	3.34	1.25
2022 .....	207,843	907	652	255	4.36	3.14	1.23
2021 .....	178,067	748	521	227	4.20	2.93	1.27
2020 .....	169,811	659	470	189	3.88	2.77	1.11
2019 .....	165,229	749	535	214	4.53	3.24	1.30
2018 .....	147,430	592	438	154	4.02	2.97	1.04
2017 .....	145,614	653	465	188	4.48	3.19	1.29
Cuban:							
2023 .....	30,001	113	86	27	3.77	2.87	0.90
2022 .....	26,390	104	65	39	3.94	2.46	1.48
2021 .....	24,437	87	68	19	3.56	2.78	*
2020 .....	23,188	98	63	34	4.23	2.72	1.47
2019 .....	23,668	98	65	33	4.14	2.75	1.39
2018 .....	23,471	90	64	26	3.83	2.73	1.11
2017 .....	23,362	93	69	24	3.98	2.95	1.03
Dominican:							
2023 .....	33,575	154	106	48	4.59	3.16	1.43
2022 .....	33,531	159	112	46	4.74	3.34	1.37
2021 .....	33,373	109	68	41	3.27	2.04	1.23
2020 .....	31,596	143	101	42	4.53	3.20	1.33
2019 .....	32,483	153	111	42	4.71	3.42	1.29
Mexican:							
2023 .....	508,127	2,601	1,845	757	5.12	3.63	1.49
2022 .....	510,194	2,442	1,688	754	4.79	3.31	1.48
2021 .....	485,127	2,380	1,633	747	4.91	3.37	1.54
2020 .....	480,531	2,264	1,586	678	4.71	3.30	1.41
2019 .....	496,716	2,462	1,693	769	4.96	3.41	1.55
2018 .....	495,831	2,426	1,690	736	4.89	3.41	1.48
2017 .....	512,126	2,588	1,795	792	5.05	3.50	1.55

**Table 1. Live births; infant, neonatal, and postneonatal deaths; and mortality rate: United States, 1995–2023, and by maternal race and Hispanic origin, 2017–2023—Con.**

Race and Hispanic origin and year	Number				Deaths per 1,000 live births		
	Live births	Infant deaths	Neonatal deaths	Postneonatal deaths	Infant	Neonatal	Postneonatal
Hispanic—Con.							
Puerto Rican:							
2023 .....	66,203	426	282	144	6.43	4.26	2.18
2022 .....	69,266	438	267	171	6.32	3.85	2.47
2021 .....	70,729	428	278	151	6.05	3.93	2.13
2020 .....	69,763	437	308	129	6.26	4.41	1.85
2019 .....	70,950	438	294	144	6.17	4.14	2.03
2018 .....	71,614	402	290	112	5.61	4.05	1.56
2017 .....	70,813	459	307	151	6.48	4.34	2.13

\* Estimate does not meet National Center for Health Statistics standards of reliability.

NOTES: People of Hispanic origin may be of any race. Infant deaths are weighted to adjust for the 1.1% of infant death records not linked to their corresponding birth certificates. The neonatal and postneonatal mortality rates combined may not exactly add to totals due to rounding. Data for infants of Dominican women are available starting with the 2019 period linked birth/infant death data files.

SOURCE: National Center for Health Statistics, National Vital Statistics System, linked birth/infant death file.

**Table 2. Infant mortality rate, live births, and infant deaths, by selected characteristics and maternal race and Hispanic origin: United States, 2023**

Characteristic	Total	Non-Hispanic					Hispanic					
		American Indian and Alaska Native <sup>1</sup>	Asian	Black	Native Hawaiian or Other Pacific Islander	White	Total <sup>2</sup>	Central and South American	Cuban	Dominican	Mexican	Puerto Rican
Infant deaths per 1,000 live births in specified group												
Total . . . . .	5.61	9.20	3.44	10.93	8.21	4.48	5.03	4.59	3.77	4.59	5.12	6.43
Age at death (days)												
Total neonatal . . . . .	3.65	4.76	2.51	6.63	4.94	2.87	3.55	3.34	2.87	3.16	3.63	4.26
Early neonatal (less than 7) . . . . .	2.84	3.78	1.90	5.14	3.95	2.22	2.83	2.73	2.17	2.38	2.88	3.26
Late neonatal (7–27) . . . . .	0.80	0.98	0.61	1.49	0.99	0.65	0.72	0.61	0.70	0.77	0.76	1.00
Postneonatal (28–364) . . . . .	1.96	4.40	0.92	4.30	3.26	1.61	1.47	1.25	0.90	1.43	1.49	2.18
Sex												
Male . . . . .	6.04	10.32	3.77	11.56	7.67	4.89	5.40	5.01	4.29	5.26	5.46	6.80
Female . . . . .	5.15	7.96	3.08	10.28	8.75	4.05	4.64	4.15	3.28	3.93	4.76	6.06
Period of gestation (weeks)												
Less than 37 . . . . .	34.74	39.67	25.68	51.16	34.02	28.38	33.89	33.03	28.68	32.29	34.81	36.09
Less than 34 . . . . .	107.87	125.51	89.71	130.35	110.09	92.96	110.29	115.83	98.70	101.43	111.54	107.32
Less than 28 . . . . .	362.14	410.40	332.10	360.63	333.33	364.49	355.51	369.96	315.27	334.66	358.19	359.17
28–31 . . . . .	43.40	*	26.91	45.26	*	41.85	46.33	58.94	42.02	37.27	43.39	37.88
32–33 . . . . .	21.04	40.88	18.31	23.75	*	19.67	21.12	19.60	*	*	24.13	20.97
34–36 . . . . .	8.31	11.51	4.10	11.87	*	7.81	7.28	6.18	*	4.87	8.17	7.52
37–41 . . . . .	2.16	4.80	1.20	3.87	4.20	1.95	1.73	1.53	1.07	1.43	1.77	2.42
37–38 . . . . .	3.22	5.87	1.74	5.02	6.96	3.13	2.42	2.15	2.02	2.01	2.53	3.11
39–40 . . . . .	1.64	4.36	0.91	3.19	2.69	1.41	1.40	1.21	0.57	1.17	1.41	2.08
41 . . . . .	1.46	*	*	2.32	*	1.43	1.11	1.40	*	*	0.95	*
42 or more . . . . .	3.66	*	*	*	*	3.47	*	*	*	*	*	*
Birthweight (grams)												
Less than 2,500 . . . . .	42.33	53.50	25.72	51.35	48.63	37.77	43.83	44.69	39.22	36.48	46.00	40.29
Less than 1,500 . . . . .	196.71	234.10	162.63	203.80	208.86	186.60	203.73	222.55	180.66	169.74	208.61	188.25
1,500–2,499 . . . . .	12.72	18.49	6.43	14.03	15.23	12.61	12.94	12.79	7.89	7.60	14.47	10.09
2,500 or more . . . . .	2.10	4.86	1.09	3.78	4.04	1.93	1.64	1.35	1.01	1.41	1.68	2.45
2,500–4,499 . . . . .	2.10	4.89	1.08	3.75	4.11	1.93	1.64	1.35	1.02	1.42	1.67	2.45
4,500 or more . . . . .	2.46	*	*	7.84	*	1.77	2.14	*	*	*	*	*
Plurality												
Single births . . . . .	5.09	8.75	3.23	9.83	7.93	4.09	4.57	4.16	3.02	4.15	4.67	6.06
Twin births . . . . .	20.78	23.95	11.13	34.50	*	15.45	22.13	24.06	29.31	17.47	22.34	15.41
Triplet and higher-order births . . . . .	52.39	*	*	85.98	*	41.91	52.34	*	*	*	53.85	*

See footnotes at end of table.

**Table 2. Infant mortality rate, live births, and infant deaths, by selected characteristics and maternal race and Hispanic origin: United States, 2023—Con.**

Characteristic	Total	Non-Hispanic					Hispanic					
		American Indian and Alaska Native <sup>1</sup>	Asian	Black	Native Hawaiian or Other Pacific Islander	White	Total <sup>2</sup>	Central and South American	Cuban	Dominican	Mexican	Puerto Rican
Infant deaths per 1,000 live births in specified group—Con.												
Age of mother												
Younger than 15.....	20.95	*	*	30.86	*	*	12.50	*	*	*	*	*
15–19.....	10.44	11.95	*	15.87	*	10.86	7.15	5.93	*	*	6.81	11.58
20–24.....	7.23	10.98	5.94	12.82	8.66	6.18	5.53	4.41	4.98	4.91	5.65	7.01
25–29.....	5.24	7.89	3.99	10.18	5.61	4.23	4.44	4.14	3.25	5.27	4.48	5.60
30–34.....	4.59	8.54	2.97	9.70	7.06	3.58	4.47	4.46	4.24	3.99	4.42	6.04
35–39.....	4.94	6.80	3.14	9.60	11.42	3.98	5.10	4.70	2.75	3.90	5.51	6.02
40–54.....	6.77	*	4.26	11.73	*	5.73	6.38	6.05	*	*	7.23	5.19
Mother's place of birth												
50 states or District of Columbia.....	5.80	9.10	3.48	11.54	8.68	4.54	5.11	4.46	4.06	3.85	5.00	6.21
Elsewhere.....	4.76	*	3.43	7.91	7.67	3.31	4.90	4.62	3.61	4.89	5.30	6.82
Live births												
Total.....	3,596,017	24,571	215,738	491,494	10,115	1,787,051	945,200	208,618	30,001	33,575	508,127	66,203
Sex												
Male.....	1,839,794	12,505	111,542	249,931	5,087	916,170	482,254	106,726	15,378	17,309	258,596	33,848
Female.....	1,756,223	12,066	104,196	241,563	5,028	870,881	462,946	101,892	14,623	16,266	249,531	32,355
Period of gestation (weeks)												
Less than 37.....	373,902	3,000	19,587	71,956	1,264	168,654	95,755	19,922	2,929	3,438	51,134	7,814
Less than 34.....	99,255	741	4,938	23,859	327	40,736	24,735	4,869	770	976	13,179	2,227
Less than 28.....	23,096	173	1,081	7,046	84	7,789	5,966	1,165	203	251	3,191	529
28–31.....	33,153	250	1,672	7,887	100	13,523	8,354	1,561	238	322	4,517	792
32–33.....	43,006	318	2,185	8,926	143	19,424	10,415	2,143	329	403	5,471	906
34–36.....	274,647	2,259	14,649	48,097	937	127,918	71,020	15,053	2,159	2,462	37,955	5,587
37–41.....	3,210,174	21,474	195,957	418,212	8,807	1,611,436	847,391	188,191	27,024	30,108	455,922	58,289
37–38.....	1,072,092	8,181	68,461	164,390	3,162	505,444	287,252	61,968	8,414	9,926	155,613	20,598
39–40.....	1,974,300	12,372	120,557	237,042	5,213	1,013,077	520,655	116,923	17,459	18,836	279,216	35,085
41.....	163,782	921	6,939	16,780	432	92,915	39,484	9,300	1,151	1,346	21,093	2,606
42 or more.....	9,299	49	140	1,028	27	6,050	1,607	389	43	26	873	87
Not stated.....	2,642	48	54	298	17	911	447	116	*	*	198	13
Birthweight (grams)												
Less than 2,500.....	309,391	2,131	20,414	73,007	946	126,063	75,133	15,395	2,167	3,043	39,194	6,925
Less than 1,500.....	49,799	346	2,521	14,357	158	18,226	12,163	2,341	393	542	6,366	1,174
1,500–2,499.....	259,592	1,785	17,893	58,650	788	107,837	62,970	13,054	1,774	2,501	32,828	5,751
2,500 or more.....	3,285,678	22,434	195,312	418,407	9,167	1,660,812	870,006	193,202	27,834	30,532	468,904	59,276
2,500–4,499.....	3,253,557	22,076	194,495	415,983	8,999	1,640,988	862,531	191,758	27,539	30,329	464,565	58,810
4,500 or more.....	32,121	358	817	2,424	168	19,824	7,475	1,444	295	203	4,339	466
Not stated.....	948	*	12	80	*	176	61	21	*	*	29	*

See footnotes at end of table.

**Table 2. Infant mortality rate, live births, and infant deaths, by selected characteristics and maternal race and Hispanic origin: United States, 2023—Con.**

Characteristic	Total	Non-Hispanic					Hispanic					
		American Indian and Alaska Native <sup>1</sup>	Asian	Black	Native Hawaiian or Other Pacific Islander	White	Total <sup>2</sup>	Central and South American	Cuban	Dominican	Mexican	Puerto Rican
Plurality		Live births—Con.										
Single births. . . . .	3,482,971	23,899	210,328	470,612	9,842	1,729,043	921,711	204,219	29,129	32,555	495,738	64,045
Twin births. . . . .	110,393	668	5,300	20,347	270	56,648	22,954	4,323	853	973	12,129	2,076
Triplet and higher-order births. . . . .	2,653	*	110	535	*	1,360	535	76	19	47	260	82
Age of mother												
Younger than 15. . . . .	1,766	23	*	486	*	351	800	304	*	12	356	30
15–19. . . . .	140,977	1,841	925	28,414	459	44,922	57,914	14,324	639	1,198	31,865	3,800
20–24. . . . .	616,970	6,285	9,420	103,077	2,424	263,760	207,702	42,377	4,816	6,116	117,437	15,415
25–29. . . . .	986,567	6,843	40,837	131,705	3,031	500,910	270,317	56,021	8,314	9,301	149,457	19,476
30–34. . . . .	1,098,052	5,970	88,489	131,500	2,409	595,741	240,489	52,706	9,659	10,013	125,796	16,884
35–39. . . . .	604,631	2,942	60,802	74,492	1,401	314,198	131,623	32,976	5,447	5,388	65,363	8,477
40–54. . . . .	147,054	667	15,258	21,820	389	67,169	36,355	9,910	1,122	1,547	17,853	2,121
Mother's place of birth												
50 states or District of Columbia. . . . .	2,744,794	24,183	51,139	396,282	3,458	1,662,528	503,410	34,084	10,583	10,386	329,614	47,987
Elsewhere. . . . .	843,233	349	164,063	93,217	6,521	121,879	440,349	174,323	19,401	23,092	178,031	17,880
Not stated. . . . .	7,990	39	536	1,995	136	2,644	1,441	211	17	97	482	336
Infant deaths												
Total. . . . .	20,162	226	742	5,374	83	8,008	4,750	958	113	154	2,601	426
Age at death												
Total neonatal. . . . .	13,113	117	542	3,260	50	5,127	3,356	697	86	106	1,845	282
Early neonatal (less than 7 days). . . . .	10,226	93	410	2,526	40	3,961	2,672	569	65	80	1,461	216
Late neonatal (7–27 days). . . . .	2,887	24	132	734	10	1,166	683	128	21	26	384	66
Postneonatal. . . . .	7,049	108	199	2,114	33	2,881	1,394	261	27	48	757	144
Sex												
Male. . . . .	11,118	129	421	2,890	39	4,482	2,604	535	66	91	1,412	230
Female. . . . .	9,044	96	321	2,484	44	3,526	2,146	423	48	64	1,189	196
Period of gestation (weeks)												
Less than 37. . . . .	12,990	119	503	3,681	43	4,786	3,245	658	84	111	1,780	282
Less than 34. . . . .	10,707	93	443	3,110	36	3,787	2,728	564	76	99	1,470	239
Less than 28. . . . .	8,364	71	359	2,541	28	2,839	2,121	431	64	84	1,143	190
28–31. . . . .	1,439	*	45	357	*	566	387	92	10	12	196	30
32–33. . . . .	905	13	40	212	*	382	220	42	*	*	132	19
34–36. . . . .	2,282	26	60	571	*	999	517	93	*	12	310	42
37–41. . . . .	6,932	103	235	1,619	37	3,140	1,468	287	29	43	807	141
37–38. . . . .	3,450	48	119	825	22	1,582	695	133	17	20	393	64
39–40. . . . .	3,242	54	110	755	14	1,424	729	141	10	22	394	73
41. . . . .	239	*	*	39	*	133	44	13	*	*	20	*
42 or more. . . . .	34	—	—	*	—	21	*	—	—	—	*	*
Not stated. . . . .	206	*	*	68	*	62	33	13	—	—	13	*

See footnotes at end of table.

**Table 2. Infant mortality rate, live births, and infant deaths, by selected characteristics and maternal race and Hispanic origin: United States, 2023—Con.**

Characteristic	Total	Non-Hispanic					Total <sup>2</sup>	Hispanic				
		American Indian and Alaska Native <sup>1</sup>	Asian	Black	Native Hawaiian or Other Pacific Islander	White		Central and South American	Cuban	Dominican	Mexican	Puerto Rican
Birthweight (grams)							Infant deaths—Con.					
Less than 2,500 . . . . .	13,098	114	525	3,749	46	4,761	3,293	688	85	111	1,803	279
Less than 1,500 . . . . .	9,796	81	410	2,926	33	3,401	2,478	521	71	92	1,328	221
1,500–2,499 . . . . .	3,301	33	115	823	12	1,360	815	167	14	19	475	58
2,500 or more . . . . .	6,916	109	213	1,582	37	3,200	1,431	261	28	43	787	145
2,500–4,499 . . . . .	6,837	108	210	1,562	37	3,165	1,415	259	28	43	778	144
4,500 or more . . . . .	79	*	*	19	—	35	16	*	—	—	*	*
Not stated . . . . .	148	*	*	43	—	46	25	*	—	—	11	*
Plurality												
Single births . . . . .	17,728	209	679	4,626	78	7,076	4,214	849	88	135	2,315	388
Twin births . . . . .	2,294	16	59	702	*	875	508	104	25	17	271	32
Triplet and higher-order births . . . . .	139	-	*	46	-	57	28	*	-	*	14	*
Age of mother												
Younger than 15 . . . . .	37	*	—	15	—	*	10	*	—	—	*	—
15–19 . . . . .	1,472	22	*	451	*	488	414	85	—	*	217	44
20–24 . . . . .	4,459	69	56	1,321	21	1,629	1,148	187	24	30	663	108
25–29 . . . . .	5,170	54	163	1,341	17	2,118	1,201	232	27	49	670	109
30–34 . . . . .	5,040	51	263	1,275	17	2,133	1,074	235	41	40	556	102
35–39 . . . . .	2,988	20	191	715	16	1,250	671	155	15	21	360	51
40–54 . . . . .	996	*	65	256	*	385	232	60	*	*	129	11
Mother's place of birth												
50 states or District of Columbia . . . . .	15,914	220	178	4,575	30	7,545	2,572	152	43	40	1,649	298
Elsewhere . . . . .	4,018	*	562	737	50	404	2,156	805	70	113	944	122
Not stated . . . . .	229	*	*	63	*	59	22	*	-	*	*	*

\* Figure does not meet National Center for Health Statistics standards of reliability.

— Quantity zero.

<sup>1</sup>Includes Aleut and Eskimo people.<sup>2</sup>Includes other and unknown Hispanic origin not stated and not shown separately.

NOTES: Infant deaths are weighted so numbers may not exactly add to totals due to rounding. Not stated responses were included in totals but not distributed among groups for rate computations. Race and Hispanic origin are reported separately on birth certificates. Race categories are consistent with the 1997 Office of Management and Budget standards. People of Hispanic origin may be of any race.

SOURCE: National Center for Health Statistics, National Vital Statistics System, linked birth/infant death file.

**Table 3. Infant deaths, percentage of deaths, and infant mortality rate, by five leading causes of infant death: United States, 2010–2023**

Year	Congenital malformations (Q00–Q99)			Short gestation and low birthweight, not elsewhere classified (P07)			Sudden infant death syndrome (R95)			Accidents (unintentional injuries) (V01–X59)			Maternal complications of pregnancy (P01)		
	Number	Percent	Rate (deaths per 100,000 live births)	Number	Percent	Rate (deaths per 100,000 live births)	Number	Percent	Rate (deaths per 100,000 live births)	Number	Percent	Rate (deaths per 100,000 live births)	Number	Percent	Rate (deaths per 100,000 live births)
2023.....	4,030	20.0	112.1	2,927	14.5	81.4	1,446	7.2	40.2	1,288	6.4	35.8	1,146	5.7	31.9
2022.....	4,004	19.5	109.2	2,884	14.0	78.6	1,531	7.4	41.7	1,351	6.6	36.8	1,213	5.9	33.1
2021.....	3,990	20.0	108.9	2,957	14.8	80.7	1,458	7.3	39.8	1,300	6.5	35.5	1,113	5.6	30.4
2020.....	4,047	20.7	112.0	3,152	16.1	87.2	1,386	7.1	38.4	1,192	6.1	33.0	1,115	5.7	30.9
2019.....	4,313	20.6	115.1	3,460	16.5	92.3	1,251	6.0	33.4	1,264	6.0	33.7	1,250	6.0	33.4
2018.....	4,501	20.9	118.7	3,683	17.1	97.1	1,331	6.2	35.1	1,169	5.4	30.8	1,371	6.4	36.2
2017.....	4,596	20.6	119.2	3,757	16.8	97.4	1,360	6.1	35.3	1,313	5.9	34.1	1,436	6.4	37.2
2016.....	4,823	20.8	122.2	3,926	17.0	99.5	1,498	6.5	38.0	1,217	5.3	30.8	1,407	6.1	35.7
2015.....	4,847	20.7	121.8	4,087	17.4	102.7	1,567	6.7	39.4	1,289	5.5	32.4	1,527	6.5	38.4
2014.....	4,754	20.5	119.2	4,172	18.0	104.6	1,541	6.6	38.6	1,163	5.0	29.2	1,580	6.8	39.6
2013.....	4,778	20.4	121.5	4,213	18.0	107.1	1,561	6.7	39.7	1,150	4.9	29.2	1,597	6.8	40.6
2012.....	4,967	21.0	125.7	4,214	17.8	106.6	1,676	7.1	42.4	1,163	4.9	29.4	1,518	6.4	38.4
2011.....	5,016	20.9	126.9	4,115	17.1	104.1	1,905	7.9	48.2	1,167	4.9	29.5	1,598	6.7	40.4
2010.....	5,115	20.8	127.9	4,151	16.9	103.8	2,058	8.4	51.5	1,107	4.5	27.7	1,563	6.4	39.1

NOTE: The five leading causes of death (based on *International Classification of Diseases, 10th Revision, 1992*) were the same for 2010–2023, but ranking changed in 2020 and later years compared with previous years.

SOURCE: National Center for Health Statistics, National Vital Statistics System, linked birth/infant death file.



**Table 4. Infant deaths and mortality rate for the five leading causes of infant death, by maternal race and Hispanic origin: United States, 2023**

[Rates are per 100,000 live births in specified group]

Cause of death (based on <i>International Classification of Diseases, 10th Revision, 1992</i> )	Non-Hispanic																	
	All races			American Indian and Alaska Native			Asian <sup>1</sup>			Black			Native Hawaiian or Other Pacific Islander			White		
	Rank	Number	Rate	Rank	Number	Rate	Rank	Number	Rate	Rank	Number	Rate	Rank	Number	Rate	Rank	Number	Rate
All causes. . . . .	...	20,162	560.7	...	226	919.8	...	742	343.9	...	5,374	1,093.4	...	83	820.6	...	8,008	448.1
Congenital malformations, deformations, and chromosomal abnormalities . . . . . (Q00–Q99)	1	4,030	112.1	1	33	134.3	1	149	69.1	2	720	146.5	1	15	148.3	1	1,827	102.2
Disorders related to short gestation and low birth weight, not elsewhere classified . . . . . (P07)	2	2,927	81.4	3	23	93.6	2	116	53.8	1	988	201.0	...	*	*	2	873	48.9
Sudden infant death syndrome . . . . . (R95)	3	1,446	40.2	2	24	97.7	6	21	9.7	3	464	94.4	2	13	128.5	3	609	34.1
Accidents (unintentional injuries) . . . . . (V01–X59)	4	1,288	35.8	4	21	85.5	7	18	8.3	4	393	80.0	...	*	*	4	572	32.0
Newborn affected by maternal complications of pregnancy . . . . . (P01)	5	1,146	31.9	5	13	52.9	3	55	25.5	5	306	62.3	...	*	*	5	383	21.4
Cause of death (based on <i>International Classification of Diseases, 10th Revision, 1992</i> )	Total Hispanic			Central and South American <sup>2</sup>			Cuban			Dominican <sup>3</sup>			Mexican			Puerto Rican		
	Rank	Number	Rate	Rank	Number	Rate	Rank	Number	Rate	Rank	Number	Rate	Rank	Number	Rate	Rank	Number	Rate
All causes. . . . .	...	4,750	502.5	...	958	459.2	...	113	376.7	...	154	458.7	...	2,601	511.9	...	426	643.5
Congenital malformations, deformations, and chromosomal abnormalities . . . . . (Q00–Q99)	1	1,130	119.6	1	268	128.5	2	20	66.7	2	22	65.5	1	644	126.7	2	67	101.2
Disorders related to short gestation and low birth weight, not elsewhere classified . . . . . (P07)	2	755	79.9	2	171	82.0	1	29	96.7	1	28	83.4	2	381	75.0	1	73	110.3
Sudden infant death syndrome . . . . . (R95)	4	223	23.6	4	37	17.7	...	*	*	3	13	38.7	5	114	22.4	4	28	42.3
Accidents (unintentional injuries) . . . . . (V01–X59)	5	208	22.0	7	30	14.4	...	*	*	...	*	*	4	123	24.2	5	26	39.3
Newborn affected by maternal complications of pregnancy . . . . . (P01)	3	310	32.8	3	53	25.4	...	*	*	4	11	32.8	3	167	32.9	3	34	51.4

... Category not applicable.

\* Figure does not meet National Center for Health Statistics standards of reliability.

<sup>1</sup>For infants born to Asian non-Hispanic women, Complications of placenta, cord and membranes (P02) was the fourth leading cause of death, with 36 deaths and a rate of 16.7. Bacterial sepsis (P36.9) was the fifth leading cause of death, with 26 deaths and a rate of 12.1.

<sup>2</sup>For infants born to Central and South American women, Bacterial sepsis (P36.9) was the fifth leading cause of death, with 33 deaths and a rate of 15.8.

<sup>3</sup>For infants born to Dominican women, Bacterial sepsis (P36.9) was tied for fourth leading cause of death, with 11 deaths and a rate of 32.8.

NOTES: Certain cause-specific infant mortality rates and rankings cannot be shown for infants of Native Hawaiian or Other Pacific Islander non-Hispanic, Cuban, or Dominican women because of the small number of infant deaths. Race and Hispanic origin are reported separately on birth certificates. Race categories are consistent with the 1997 Office of Management and Budget standards. People of Hispanic origin may be of any race.

SOURCE: National Center for Health Statistics, National Vital Statistics System, linked birth/infant death file.

**Table 5. Infant mortality rate: United States and each state, 2023**

[By place of residence]

Area	Rate (deaths per 1,000 births)	Infant deaths	Live births
United States <sup>1</sup>	5.61	20,162	3,596,017
Alabama	7.64	442	57,858
Alaska	7.21	65	9,015
Arizona	5.54	433	78,096
Arkansas	8.22	290	35,264
California	4.10	1,642	400,108
Colorado	4.55	280	61,494
Connecticut	4.49	155	34,559
Delaware	6.14	64	10,427
District of Columbia	6.97	55	7,896
Florida	6.10	1,351	221,410
Georgia	6.99	874	125,120
Hawaii	4.86	72	14,808
Idaho	4.38	98	22,397
Illinois	5.91	738	124,820
Indiana	6.51	514	79,000
Iowa	5.10	184	36,052
Kansas	5.23	178	34,065
Kentucky	6.58	342	51,984
Louisiana	7.14	392	54,927
Maine	5.68	66	11,627
Maryland	5.61	368	65,594
Massachusetts	3.28	220	67,093
Michigan	6.09	604	99,124
Minnesota	4.73	292	61,715
Mississippi	8.94	308	34,459
Missouri	6.12	411	67,123
Montana	5.51	61	11,078
Nebraska	6.39	154	24,111
Nevada	5.88	187	31,794
New Hampshire	2.93	35	11,936
New Jersey	3.69	373	101,001
New Mexico	4.39	92	20,951
New York	4.03	821	203,612
North Carolina	6.95	834	120,082
North Dakota	4.87	47	9,647
Ohio	7.16	909	126,896
Oklahoma	7.12	341	47,909
Oregon	4.62	177	38,298
Pennsylvania	5.57	707	126,951
Rhode Island	4.79	47	9,805
South Carolina	6.96	402	57,729
South Dakota	6.34	71	11,201
Tennessee	6.48	538	83,021
Texas	5.83	2,263	387,945
Utah	5.22	235	45,019
Vermont	3.16	16	5,065
Virginia	5.87	544	92,649
Washington	5.04	408	80,932
West Virginia	5.60	93	16,606
Wisconsin	5.77	345	59,754
Wyoming	3.84	23	5,990
Puerto Rico	7.10	132	18,601
Guam	15.30	36	2,353

<sup>1</sup>Does not include Puerto Rico or Guam.

SOURCE: National Center for Health Statistics, National Vital Statistics System, linked birth/infant death file.

Technical Notes

Data source and 2003 revision

Information on the data source for the linked birth/infant death file is available elsewhere (1). Additionally, further information on the 2003 revision of the birth certificate is available (3); see also the U.S. Standard Certificate of Live Birth (10).

Weighting

In 2023, a record weight was added to the U.S. linked file to compensate for the 1.2% of infant death records that could not be linked to their corresponding birth certificates. The percentage of records linked varied by registration area, ranging from 93.8% through 100.0% (Table I). The number of infant deaths in the linked file for the 50 states and the District of Columbia was weighted to equal the sum of the linked plus unlinked infant deaths by state of occurrence of birth and age at death (younger than 7 days, 7–27 days, and 28 days to younger than 1 year). The addition of the weight reduced the potential for bias in comparing infant mortality rates by maternal and infant characteristics.

The 2023 linked file initially included 20,192 infant death records. Of these records, 19,947 were linked; 245 were unlinked because corresponding birth certificates could not be identified. The 20,192 linked and unlinked records contained 28 records of infants whose mothers’ usual place of residence was outside of the United States; these records were excluded from linked file analyses for a weighted total of 20,162 infant deaths by place of residence for 2023.

Comparison of infant mortality data between linked file and vital statistics mortality file

The overall infant mortality rate of 5.61 from the 2023 period linked file is statistically the same as that from the 2023 vital statistics mortality file (5.60) (11). The number of infant deaths in the linked file (19,947) differs slightly from the number in the mortality file (20,145) (11). Differences in numbers of infant deaths between the two data sources are primarily due to geographic coverage differences. For the vital statistics mortality file, all deaths occurring in the 50 states and the District of Columbia are included regardless of the place of birth of the infant. In contrast, to be included in the U.S. linked file, both the birth and death must occur in the 50 states or the District of Columbia (the territory linked file is a separate file). Weighting of the linked file also may contribute to small differences in numbers and rates by specific variables between these two data sets.

Period of gestation

Beginning with the 2014 data year, the National Center for Health Statistics (NCHS) transitioned to a new standard for estimating the gestational age of the newborn. The new measure—the obstetric estimate of gestation at delivery—replaces the measure based on the date of the last normal menses

Table I. Percentage of infant deaths linked to their corresponding birth records, by state of occurrence of death: United States and each state, 2023

Area	Percent linked by state of occurrence of death
United States	98.8
Alabama	100.0
Alaska	96.7
Arizona	98.6
Arkansas	100.0
California	98.2
Colorado	100.0
Connecticut	100.0
Delaware	100.0
District of Columbia	99.2
Florida	100.0
Georgia	99.4
Hawaii	98.5
Idaho	100.0
Illinois	99.6
Indiana	99.8
Iowa	100.0
Kansas	100.0
Kentucky	98.4
Louisiana	97.2
Maine	100.0
Maryland	99.4
Massachusetts	100.0
Michigan	99.3
Minnesota	100.0
Mississippi	99.6
Missouri	99.8
Montana	100.0
Nebraska	98.1
Nevada	99.5
New Hampshire	100.0
New Jersey	97.4
New Mexico	93.8
New York	97.6
New York City	99.5
North Carolina	98.0
North Dakota	100.0
Ohio	99.7
Oklahoma	99.7
Oregon	99.5
Pennsylvania	99.2
Rhode Island	100.0
South Carolina	100.0
South Dakota	100.0
Tennessee	100.0
Texas	95.4
Utah	100.0
Vermont	100.0
Virginia	98.6
Washington	100.0
West Virginia	97.8
Wisconsin	99.4
Wyoming	100.0

SOURCE: National Center for Health Statistics, National Vital Statistics System, linked birth/infant death file.

(12). Accordingly, gestational age data shown in this report are based on the obstetric estimate of gestation at delivery. National data based on obstetric estimate of gestation at delivery data are available only from data year 2007 forward. Information on and discussion of the reasons for the change, as well as a detailed comparison of the two measures, are presented elsewhere (12).

## Sex, birthweight, plurality, and nativity

Detailed definitions and more information on sex, birthweight, plurality, and nativity are available elsewhere (1,3).

## Cause-of-death classification

The mortality statistics presented in this report were compiled in accordance with the current revision of the *International Statistical Classification of Diseases* (ICD). ICD provides the basic guidance to code and classify causes of death, details disease classification, and supplies definitions, tabulation lists, the format of the death certificate, and the rules for coding cause of death. Cause-of-death data presented in this report were coded by procedures outlined in annual issues of the *NCHS Instruction Manual* (13,14).

In this report, tabulations of cause-of-death statistics are based solely on the underlying cause of death. Generally, more medical information is reported on death certificates than is directly reflected in the underlying cause of death. This is captured in NCHS multiple cause-of-death statistics (15,16).

## Tabulation lists and cause-of-death ranking

The cause-of-death rankings for ICD-10 are based on the “List of 130 Selected Causes of Infant Death.” The tabulation lists and rules for ranking leading causes of death are published in the *NCHS Instruction Manual*, Part 9: “ICD-10 Cause-of-death Lists for Tabulating Mortality Statistics” (17).

## Computation of rates

Information on and discussion of computation of rates (1) is also available from the “User Guide to the 2010 Natality Public Use File” at: [https://ftp.cdc.gov/pub/Health\\_Statistics/NCHS/Dataset\\_Documentation/DVS/natality/UserGuide2010.pdf](https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/DVS/natality/UserGuide2010.pdf).

## Presentation of counts, rates, and percentages

An asterisk (\*) in the tables indicates that a count, rate, or percentage does not meet NCHS standards of reliability (18,19). Three separate criteria are used to determine if a count (number of events), rate, or proportion meets these suppression standards (3).

## Presentation of counts and rates

New criteria for showing counts and rates were adopted by NCHS beginning with 2023 data (18). For counts, the number of deaths is shown depending on the count of deaths and on the relative width of the confidence interval of the count, based on a gamma distribution. Before the 2023 data year, the number of

deaths was shown regardless of the count. For rates, if a rate is shown depends on the count for the numerator and on the relative width of the confidence interval of the rate based on a Student's *t* confidence interval for the logarithm of the rate. Rates published for data years before 2023 were represented by an asterisk when the numerator was fewer than 20 deaths. For detailed information on the new criteria, see “National Center for Health Statistics Data Presentation Standards for Rates and Counts” (18).

## Presentation of percentages

For proportions (or percentages) for linked birth/infant deaths, new criteria adopted by NCHS were implemented starting with the 2023 data year (19). For 2023 and later, a proportion (percentage) was shown based on the denominator size and on the absolute or relative widths of the confidence interval of the proportion or percentage calculated using the Clopper–Pearson method. For the presentation criterion used before the 2023 data year, see the 2023 Natality User Guide (3). Starting in 2023, proportions or percentages based on fewer than 10 infant deaths are represented with an asterisk. For detailed information on these criteria, see “National Center for Health Statistics Data Presentation Standards for Proportions” (19).

## Random variation in infant mortality rates

For information and discussion on random variation and significance testing for linked data (1), see also the “User Guide to the 2010 Natality Public Use File” at: [https://ftp.cdc.gov/pub/Health\\_Statistics/NCHS/Dataset\\_Documentation/DVS/natality/UserGuide2010.pdf](https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/DVS/natality/UserGuide2010.pdf).

## Availability of linked file

Linked file data are available for download from the Vital Statistics Online Data Portal: [https://www.cdc.gov/nchs/data\\_access/vitalstatsonline.htm](https://www.cdc.gov/nchs/data_access/vitalstatsonline.htm). Linked period file data may also be accessed via the Centers for Disease Control and Prevention's WONDER database, available from: <https://wonder.cdc.gov/lbd.html>. Beginning with 2005, the public-use file no longer includes geographic detail; such files are available upon special request (see the NCHS Division of Vital Statistics data release policy at: <https://www.cdc.gov/nchs/nvss/nvss-restricted-data.htm>). Data are also available in issues of Vital and Health Statistics, Series 20; National Vital Statistics Reports; and NCHS Data Briefs from the NCHS website: <https://www.cdc.gov/nchs/products/index.htm>.

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