

## Infant Mortality in the United States, 2022: Data From the Period Linked Birth/Infant Death File

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### Abstract

**Objectives**—This report presents final 2022 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 2022 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 20,577 infant deaths were reported in the United States in 2022, up 3% from 2021. The U.S. infant mortality rate was 5.61 infant deaths per 1,000 live births, a 3% increase from the rate of 5.44 in 2021. The neonatal mortality rate increased 3% from 3.49 in 2021 to 3.59 in 2022, and the postneonatal mortality rate increased 4% from 1.95 to 2.02. The overall infant mortality rate increased for infants of American Indian and Alaska Native non-Hispanic, White non-Hispanic, and Dominican women in 2022 compared with 2021; changes in rates for the other race and Hispanic-origin groups were not significant. Infants of Black non-Hispanic women had the highest mortality rate (10.90) in 2022, followed by infants of American Indian and Alaska Native non-Hispanic and Native Hawaiian or Other Pacific Islander non-Hispanic (9.06 and 8.50, respectively), Hispanic (4.89), White non-Hispanic (4.52), and Asian non-Hispanic (3.51) women. Mortality rates increased from 2021 to 2022 among preterm (less than 37 weeks of gestation) infants (33.59 to 34.78) and for infants born term (37 to 41 weeks of gestation) (2.08 to 2.18). The five leading causes of infant death in 2022 were the same as in 2021. Infant mortality rates by state for 2022 ranged from a low of 3.32 in Massachusetts to a high of 9.11 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 2022 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 2022 (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 2022, 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 2022 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 2022 Period/2021 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, accordingly, 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 2022, 98.6% of all infant death records were successfully linked to their corresponding birth records. These records were weighted to adjust for the 1.4% 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 2022, race of mother was imputed for 7.6% of births; mother's age was imputed for 0.01% 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 2022 and 2021 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. However, women with one risk factor often have other risk factors. For example, teen mothers are more likely to be unmarried and of a low-income status, while mothers who do not receive prenatal care are more likely to be of a low-income status and uninsured. The preferred method for disentangling the multiple interrelationships among risk factors is multivariate analysis; however, an understanding of the basic relationships between risk factors and infant mortality is the first step before more sophisticated types of analyses and may help identify high-risk subgroups for prevention efforts.

This report 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.

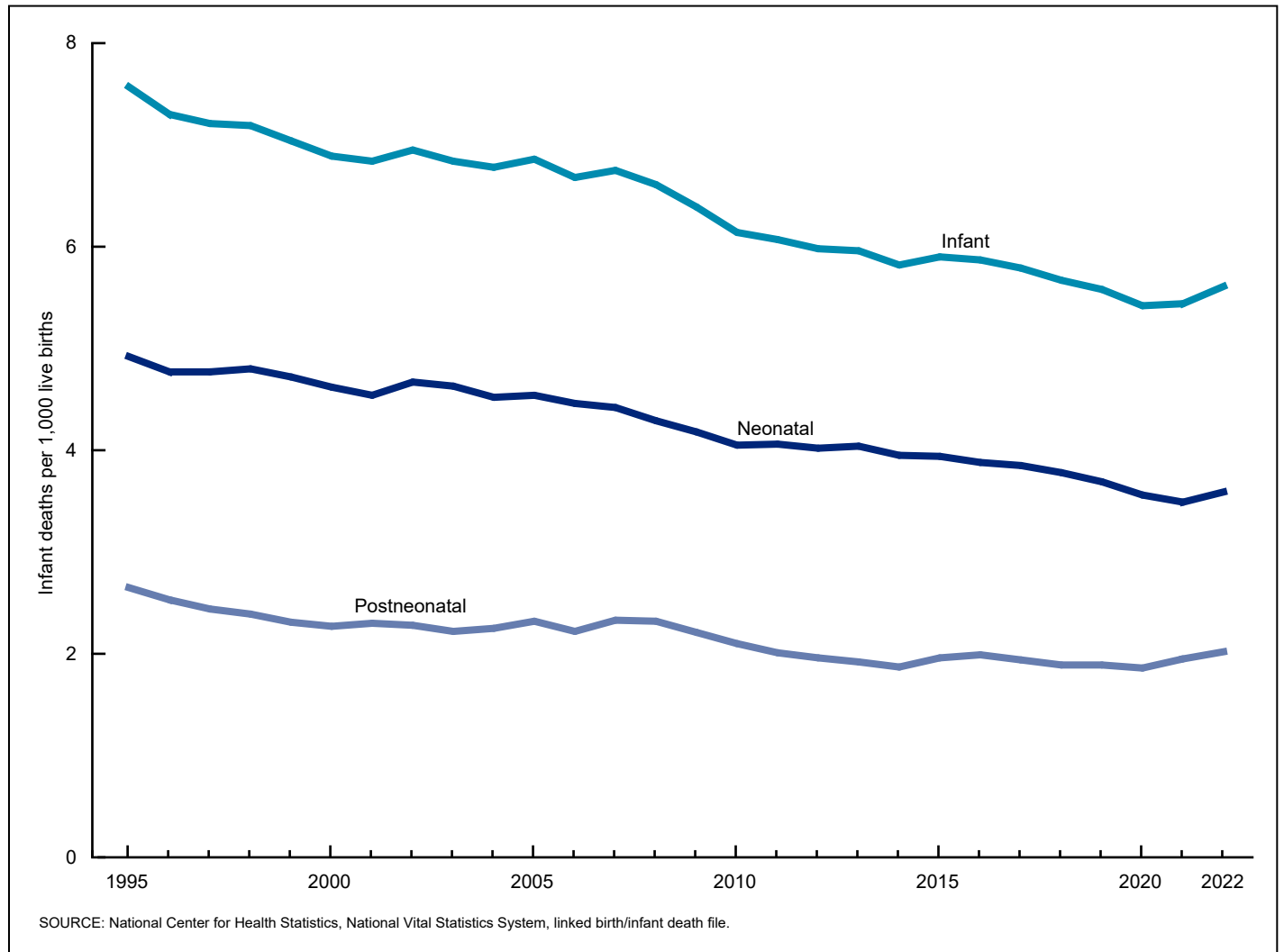
*Race and Hispanic origin*—Infant mortality rates are presented by race and Hispanic origin of the mother. The linked file is useful for computing accurate infant mortality rates by these characteristics because the race and Hispanic origin of the mother from the birth certificate are used in both the 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, 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

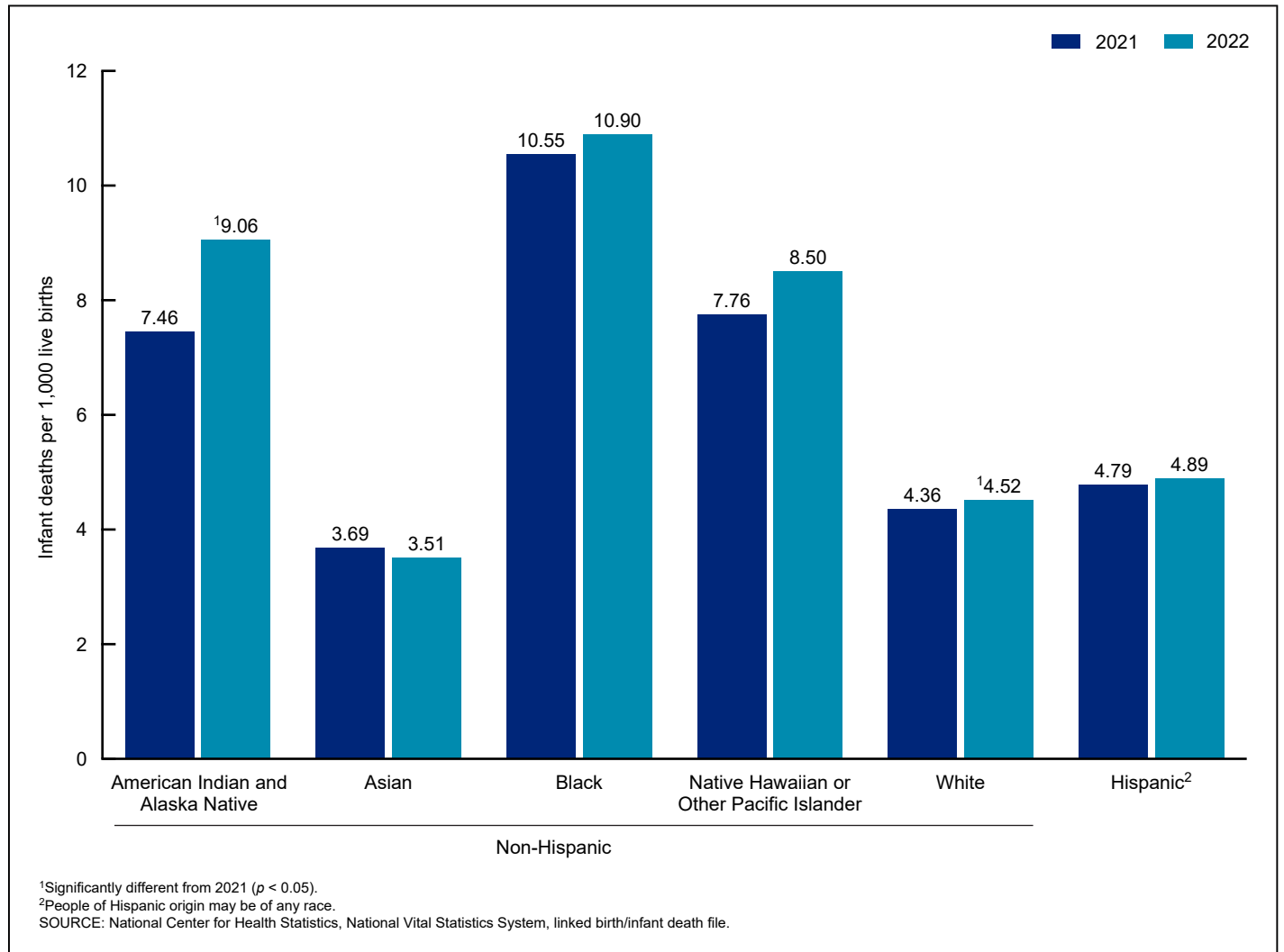
### Trends in infant mortality and infant age at death

- In 2022, 20,577 infant deaths were reported in the United States, an increase of 3% from 2021 (19,928) (Figure 1, Table 1). The infant mortality rate was 5.61 deaths per 1,000 live births in 2022, an increase of 3% from the 2021 rate of 5.44.
- 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 in 2022 was down 19% since the last increase in 2002 (6.95).
- The 2022 neonatal mortality rate (infant deaths at less than 28 days) of 3.59 was 3% higher than the rate in 2021 (3.49). The neonatal mortality rate has generally declined since 1995 and decreased 23% since the last increase in 2002 (4.67).
- The 2022 postneonatal mortality rate (infant deaths at 28 days or more) increased 4% to 2.02 from 1.95 in 2021. The postneonatal mortality rate has also generally declined since 1995 and decreased 11% since 2002 (2.28).

**Figure 1. Infant, neonatal, and postneonatal mortality rates: United States, 1995–2022**

## Race and Hispanic origin

- The mortality rate for infants of American Indian and Alaska Native women increased from 7.46 infant deaths per 1,000 births to 9.06 from 2021 to 2022, and the rate for infants of White women increased from 4.36 to 4.52 (Tables 1 and 2, Figure 2). Increases in rates for infants born to Black (10.55 to 10.90), Hispanic (4.79 to 4.89), and Native Hawaiian or Other Pacific Islander (7.76 to 8.50) women were not significant. The decline in the rate for infants born to Asian women (3.69 to 3.51) was not significant.
- Among Hispanic-origin subgroups, the mortality rate for infants of Dominican women increased from 3.27 to 4.74 from 2021 to 2022; increases in mortality rates for infants of Central and South American (4.20 to 4.36), Cuban (3.56 to 3.94), and Puerto Rican (6.05 to 6.32) women were not significant. The decline in the mortality rate for infants of Mexican women (4.91 to 4.79) from 2021 to 2022 was not significant.
- In 2022, infant mortality continued to vary by race: infants of Black women had the highest mortality rate (10.90), followed by infants of American Indian and Alaska Native and Native Hawaiian or Other Pacific Islander (9.06 and 8.50, respectively), Hispanic (4.89), White (4.52), and Asian (3.51) women.
- Infants of Black women also had the highest neonatal mortality rate in 2022 (6.44) compared with infants of the other race and Hispanic-origin groups; the lowest mortality rate was for infants of Asian women (2.47) (Table 2).
- In 2022, postneonatal mortality rates were higher for infants of Black (4.45), American Indian and Alaska Native (3.81), and Native Hawaiian or Other Pacific Islander (3.75) women than for infants of White (1.63), Hispanic (1.54), and Asian (1.03) women.
- Among Hispanic-origin subgroups in 2022, the mortality rate for infants of Puerto Rican women (6.32) was higher than that of infants of Mexican (4.79), Dominican (4.74), Central and South American (4.36), and Cuban (3.94) women.

**Figure 2. Infant mortality rate, by maternal race and Hispanic origin: United States, 2021 and 2022**

## Maternal age

- The mortality rate for infants of women ages 25–29 increased from 2021 to 2022 (5.15 infant deaths per 1,000 births to 5.37) (Figure 3, Table 2). Increases in rates for infants of females ages 15–19 (9.15 to 9.86), 20–24 (6.87 to 7.13), 30–34 (4.48 to 4.59), and 35–39 (4.92 to 4.99) were not significant.
- Nonsignificant declines were seen for infants of females younger than 15 (14.92 to 14.25) and for infants of women age 40 and older (6.74 to 6.73).
- In 2022, mortality rates were highest for infants of females younger than age 15 and ages 15–19 (14.25 and 9.86, respectively), decreased to a low of 4.59 for infants of women ages 30–34, and then increased to 6.73 for infants of women age 40 and older.

## Gestational age

- Mortality rates increased among preterm infants overall (less than 37 weeks of gestation) from 2021 to 2022, from 33.59 deaths per 1,000 live births to 34.78 (Table, Table 2).

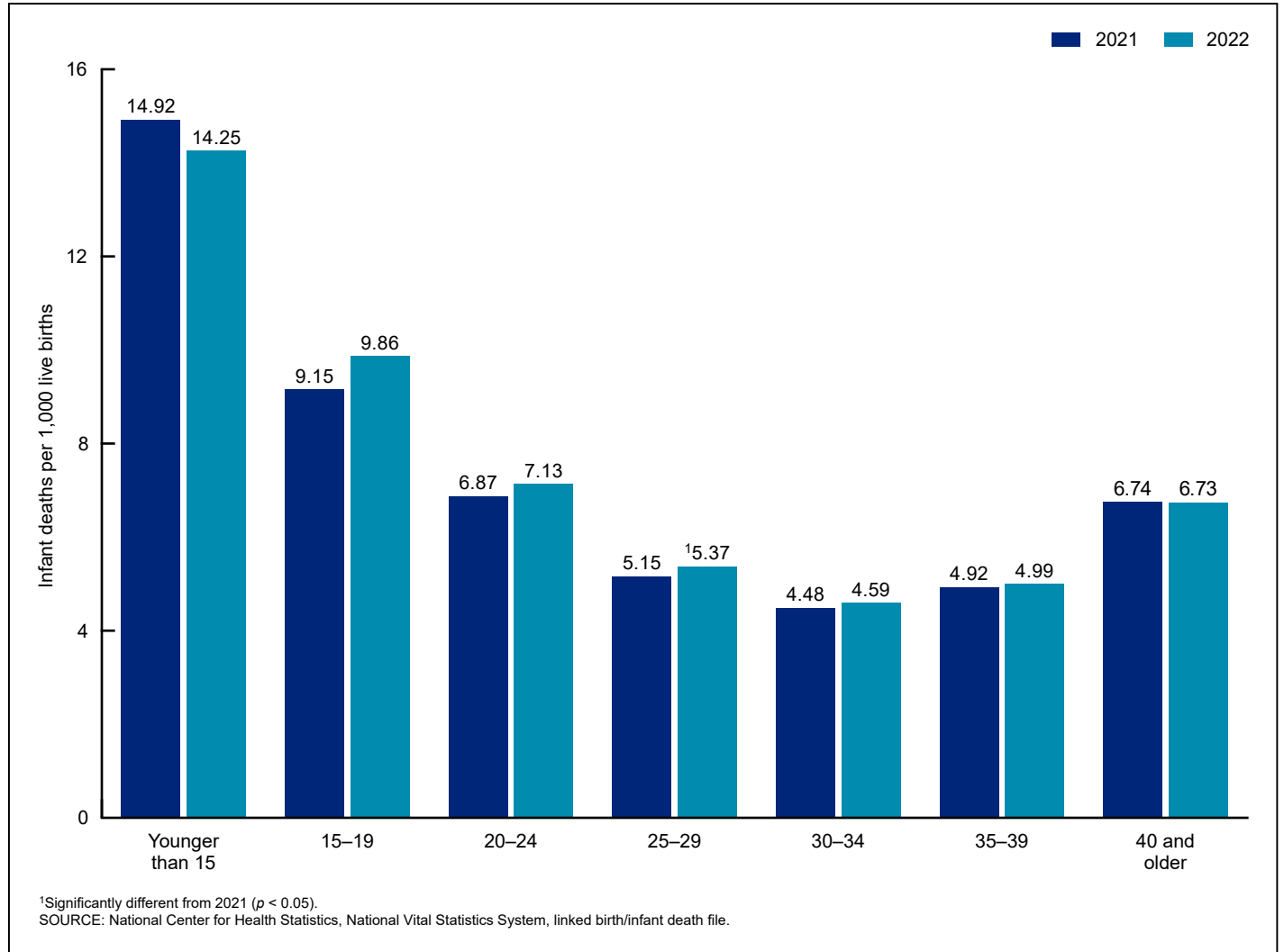
Increases were seen among early preterm infants (less than 34 weeks of gestation), from 103.08 to 107.94; the increase for infants born at 34–36 weeks (8.11 to 8.29) was not significant.

- Mortality rates also rose for infants born at term, or at 37–41 weeks (2.08 to 2.18). The increase in the rate at 42 weeks or more (3.79 to 4.23) was nonsignificant.
- In 2022, 65% of infant deaths occurred among infants born preterm (less than 37 weeks of gestation), unchanged from 2021.

## Leading causes of infant death

- In 2022, the five leading causes of all infant deaths were the same as those in 2021: congenital malformations (19.5% of infant deaths), disorders related to short gestation and low birth weight (14.0%), sudden infant death syndrome (SIDS) (7.4%), unintentional injuries (6.6%), and maternal complications (5.9%) (Table 3).
- From 2021 to 2022, the infant mortality rate increased for maternal complications (from 30.4 infant deaths per 100,000 live births to 33.1).

**Figure 3. Infant mortality rate, by maternal age: United States, 2021 and 2022**



**Table. Infant mortality rate, by gestational age: United States, 2015-2022**

Year	Less than 32 weeks	32-33 weeks	34-36 weeks	37-41 weeks	42 weeks or more
	Deaths per 1,000 live births				
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

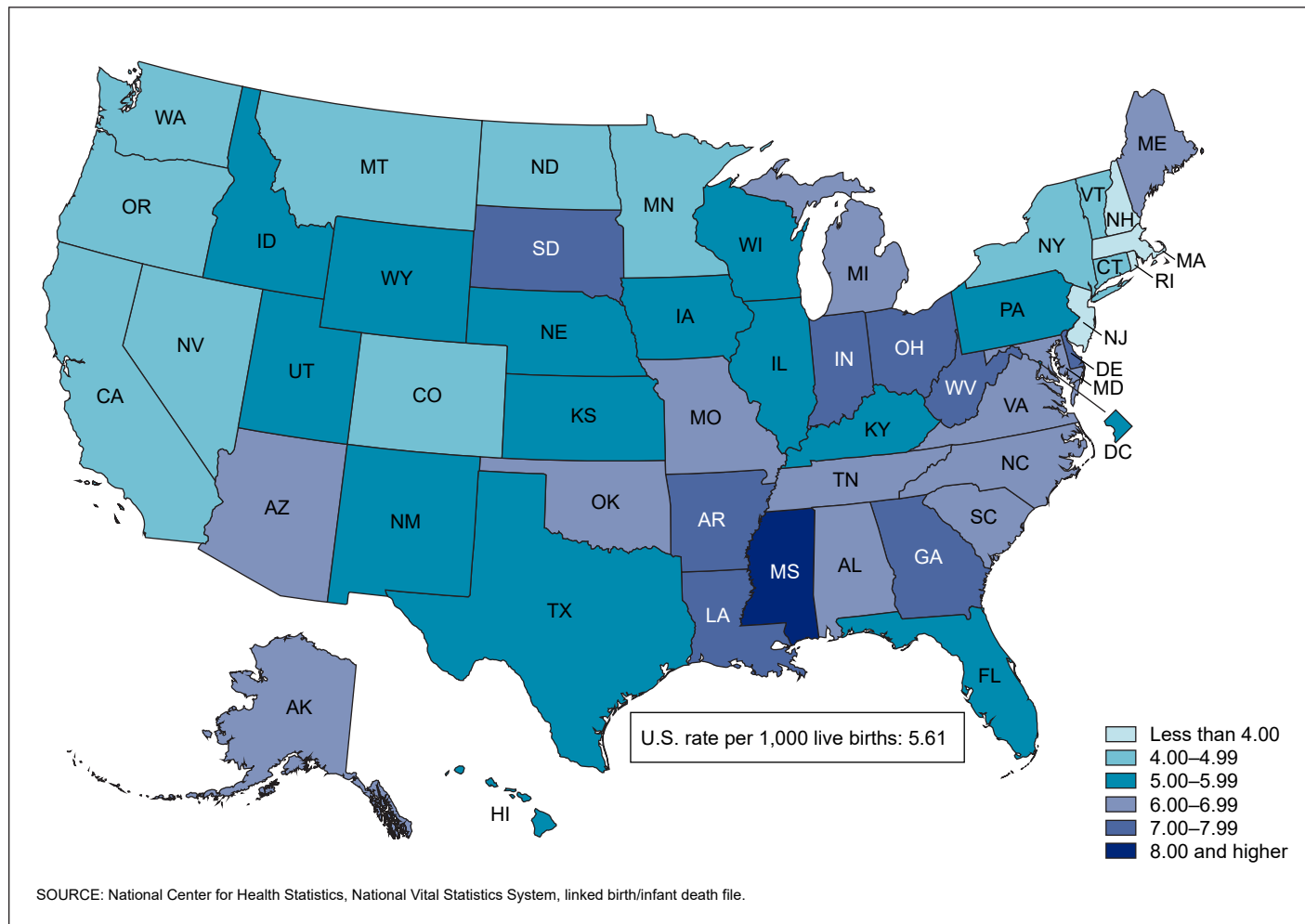
SOURCE: National Center for Health Statistics, National Vital Statistics System, linked birth/infant death file.

- The increases in rates for congenital malformations (108.9 to 109.2), SIDS (39.8 to 41.7), and unintentional injuries (35.5 to 36.8), and the decline for disorders related to short gestation and low birth weight (80.7 to 78.6) were not significant (Table 3).

- Congenital malformations was the leading cause of death for infants born to American Indian and Alaska Native (178.8), Asian (70.3), White (99.6), and Hispanic (119.5) women in 2022 (Table 4).
- In 2022, disorders related to short gestation and low birth weight was the leading cause of death for infants of Black women (188.1).

**Infant mortality by state**

- By state, infant mortality ranged from a low of 3.32 infant deaths per 1,000 births in Massachusetts to a high of 9.11 in Mississippi (Figure 4, Table 5).
- Twelve states had infant mortality rates significantly lower than the national infant mortality rate: California, Colorado, Connecticut, Massachusetts, Minnesota, Nevada, New Hampshire, New Jersey, New York, Oregon, Rhode Island, and Washington.
- Nineteen states had infant mortality rates significantly higher than the U.S. infant mortality rate: Alabama, Arizona, Arkansas, Delaware, Florida, Georgia, Indiana, Louisiana, Michigan, Mississippi, Missouri, North Carolina, Ohio,

**Figure 4. Infant mortality rate, by state: United States, 2022**

Oklahoma, South Carolina, South Dakota, Tennessee, Virginia, and West Virginia.

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**Table 1. Live births; infant, neonatal, and postneonatal deaths; and mortality rate: United States, 1995–2022, and by maternal race and Hispanic origin, 2017–2022**

Race and Hispanic origin and year	Number				Deaths per 1,000 live births		
	Live births	Infant deaths	Neonatal deaths	Postneonatal deaths	Infant	Neonatal	Postneonatal
<b>All race and Hispanic-origin groups</b>							
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
<b>Non-Hispanic, single race</b>							
<b>American Indian and Alaska Native:</b>							
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
<b>Asian:</b>							
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
<b>Black:</b>							
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
<b>Native Hawaiian or Other Pacific Islander:</b>							
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

See footnotes at end of table.



**Table 1. Live births; infant, neonatal, and postneonatal deaths; and mortality rate: United States, 1995–2022, and by maternal race and Hispanic origin, 2017–2022—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.							
White:							
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							
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:							
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:							
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:							
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:							
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
Puerto Rican:							
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, 2022**

Characteristic	Non-Hispanic						Hispanic					
	Total	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	9.06	3.51	10.90	8.50	4.52	4.89	4.36	3.94	4.74	4.79	6.32
Age at death (days)												
Total neonatal	3.59	5.25	2.47	6.44	4.74	2.89	3.35	3.14	2.46	3.34	3.31	3.85
Early neonatal (less than 7)	2.81	3.73	2.01	5.05	3.36	2.23	2.65	2.47	1.74	2.77	2.61	3.06
Late neonatal (7–27)	0.78	1.48	0.47	1.40	*	0.66	0.70	0.67	*	*	0.70	0.79
Postneonatal (28–364)	2.02	3.81	1.03	4.45	3.75	1.63	1.54	1.23	1.48	1.37	1.48	2.47
Sex												
Male	6.08	10.56	3.87	11.80	8.39	4.89	5.30	4.67	4.16	4.83	5.18	6.93
Female	5.12	7.51	3.12	9.96	8.40	4.13	4.46	4.06	3.64	4.65	4.38	5.69
Period of gestation (weeks)												
Less than 37	34.78	37.71	25.79	50.86	41.39	28.77	32.86	31.16	25.70	35.17	32.49	37.29
Less than 34	107.94	110.45	91.06	130.27	129.45	94.39	105.21	103.36	79.94	105.75	104.82	111.61
Less than 28	364.37	373.68	362.49	352.45	482.76	365.71	357.16	359.10	295.86	330.77	356.90	361.16
28–31	43.88	*	28.64	46.09	*	44.52	42.83	47.47	*	*	44.37	35.51
32–33	21.05	*	12.64	25.77	*	20.83	18.54	20.50	*	*	17.91	*
34–36	8.29	12.12	4.67	10.83	*	7.91	7.60	7.49	*	*	7.73	8.07
37–41	2.18	4.74	1.21	3.97	3.84	1.95	1.72	1.51	1.64	1.29	1.68	2.29
37–38	3.22	7.63	1.65	5.32	*	3.03	2.42	2.25	*	*	2.39	3.02
39–40	1.66	3.11	0.98	3.13	*	1.47	1.36	1.15	1.50	1.21	1.32	1.83
41	1.73	*	*	3.11	*	1.53	1.52	*	*	*	1.37	*
42 or more	4.23	*	–	*	–	3.52	*	*	–	–	*	–
Birthweight (grams)												
Less than 2,500	42.13	54.63	26.19	51.07	55.56	37.97	42.11	41.27	32.53	38.41	42.86	41.56
Less than 1,500	194.15	221.08	166.60	199.52	258.28	183.55	196.99	200.26	151.35	177.98	197.74	196.61
1,500–2,499	13.09	20.20	6.42	14.19	*	13.58	12.67	13.23	*	*	13.72	9.47
2,500 or more	2.10	4.65	1.11	3.78	4.00	1.90	1.67	1.43	1.56	1.38	1.60	2.40
2,500–4,499	2.09	4.69	1.10	3.76	3.95	1.90	1.65	1.43	1.49	1.39	1.58	2.38
4,500 or more	2.64	*	*	*	*	1.84	3.16	*	*	–	*	*
Plurality												
Single births	5.10	8.79	3.24	9.79	8.39	4.11	4.49	4.03	3.82	3.91	4.40	5.84
Twin births	20.20	*	13.33	34.07	*	15.59	19.57	18.49	*	32.36	19.27	20.42
Triplet and higher-order births	59.76	*	*	104.32	–	47.77	45.22	*	–	–	*	*
Age of mother												
Younger than 15	14.25	*	*	*	–	*	*	*	–	–	–	–
15–19	9.86	*	*	13.94	*	10.53	6.93	5.45	*	*	5.95	9.77
20–24	7.13	9.50	4.39	12.15	*	6.48	5.03	3.85	*	5.61	4.79	7.24
25–29	5.37	7.70	4.02	10.75	11.32	4.31	4.35	4.26	3.36	3.85	4.06	6.25
30–34	4.59	8.22	3.31	9.46	9.03	3.70	4.29	4.02	2.97	3.83	4.33	5.83
35–39	4.99	11.83	3.10	10.53	*	3.65	5.44	4.67	5.41	4.36	5.97	4.32
40–54	6.73	*	3.94	11.23	*	5.38	6.84	6.47	*	*	7.71	*

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, 2022—Con.**

Characteristic	Non-Hispanic						Hispanic					
	Total	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.												
Mother's place of birth												
50 states or District of Columbia . . . . .	5.87	9.06	3.73	11.56	8.90	4.58	5.23	4.45	5.02	5.87	4.83	6.71
Elsewhere. . . . .	4.17	*	3.40	7.65	8.10	3.40	4.41	4.33	3.11	4.15	4.66	5.00
Live births												
Total . . . . .	3,667,758	25,721	218,994	511,439	10,122	1,840,739	937,421	207,843	26,390	33,531	510,194	69,266
Sex												
Male . . . . .	1,874,446	13,063	112,726	259,987	5,243	942,920	477,401	106,018	13,475	16,987	259,794	35,352
Female . . . . .	1,793,312	12,658	106,268	251,452	4,879	897,819	460,020	101,825	12,915	16,544	250,400	33,914
Period of gestation (weeks)												
Less than 37 . . . . .	380,548	3,235	20,127	74,553	1,208	173,638	94,306	19,670	2,490	3,355	51,086	7,937
Less than 34 . . . . .	101,167	842	4,920	24,986	309	41,902	24,408	4,857	713	974	13,032	2,240
Less than 28 . . . . .	23,369	190	1,029	7,496	58	7,968	5,653	1,061	169	260	2,984	587
28–31 . . . . .	33,663	284	1,676	7,984	110	14,062	8,289	1,601	224	303	4,575	704
32–33 . . . . .	44,135	368	2,215	9,506	141	19,872	10,466	2,195	320	411	5,473	949
34–36 . . . . .	279,381	2,393	15,207	49,567	899	131,736	69,898	14,813	1,777	2,381	38,054	5,697
37–41 . . . . .	3,275,078	22,346	198,619	435,385	8,852	1,660,116	841,129	187,675	23,851	30,145	458,026	61,202
37–38 . . . . .	1,074,082	8,124	69,213	167,263	3,075	509,163	282,083	61,782	7,451	9,734	154,002	21,164
39–40 . . . . .	2,027,670	13,198	122,060	249,451	5,239	1,053,269	517,597	116,068	15,365	18,982	281,389	37,245
41 . . . . .	173,326	1,024	7,346	18,671	538	97,684	41,449	9,825	1,035	1,429	22,635	2,793
42 or more . . . . .	9,461	80	194	1,175	39	5,974	1,565	392	43	24	856	98
Not stated . . . . .	2,671	60	54	326	23	1,011	421	106	6	7	226	29
Birthweight (grams)												
Less than 2,500 . . . . .	316,381	2,270	20,619	75,686	864	131,368	73,996	15,120	1,998	2,994	39,129	6,881
Less than 1,500 . . . . .	50,760	389	2,545	15,061	151	18,850	11,818	2,272	370	545	6,195	1,180
1,500–2,499 . . . . .	265,621	1,881	18,074	60,625	713	112,518	62,178	12,848	1,628	2,449	32,934	5,701
2,500 or more . . . . .	3,350,350	23,447	198,357	435,642	9,257	1,709,108	863,368	192,707	24,388	30,534	471,042	62,378
2,500–4,499 . . . . .	3,317,042	23,047	197,470	432,932	9,116	1,689,020	855,451	191,128	24,137	30,297	466,357	61,872
4,500 or more . . . . .	33,308	400	887	2,710	141	20,088	7,917	1,579	251	237	4,685	506
Not stated . . . . .	1,027	4	18	111	1	263	57	16	4	3	23	7
Plurality												
Single births . . . . .	3,550,380	25,024	213,707	489,720	9,890	1,779,221	913,854	203,473	25,666	32,521	497,316	67,099
Twin births . . . . .	114,483	682	5,177	21,163	232	59,969	22,992	4,272	711	989	12,560	2,106
Triplet and higher-order births . . . . .	2,895	15	110	556	–	1,549	575	98	13	21	318	61

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, 2022—Con.**

Characteristic	Non-Hispanic						Hispanic					
	Total	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
Age of mother							Live births—Con.					
Younger than 15.....	1,825	32	4	482	4	407	796	284	2	14	360	42
15–19.....	143,789	1,924	982	29,194	431	48,060	56,566	12,659	582	1,235	32,116	4,093
20–24.....	638,685	6,736	10,016	110,822	2,609	276,137	206,948	41,251	3,863	6,243	118,647	16,429
25–29.....	1,013,417	7,275	42,087	142,234	2,915	515,204	270,357	55,454	7,136	9,607	151,390	20,792
30–34.....	1,118,787	6,202	89,679	133,896	2,435	615,589	237,703	54,524	9,086	9,666	124,391	17,488
35–39.....	606,598	2,873	61,259	73,610	1,375	318,572	129,675	33,630	4,805	5,275	65,649	8,330
40–54.....	144,657	679	14,967	21,201	353	66,770	35,376	10,041	916	1,491	17,641	2,092
Mother's place of birth												
50 states or District of Columbia.....	2,826,844	25,287	52,052	416,374	3,706	1,714,360	510,450	40,690	10,951	10,569	329,693	49,898
Elsewhere.....	832,728	383	166,347	93,181	6,295	123,568	425,599	166,937	15,414	22,880	180,061	19,018
Not stated.....	8,186	51	595	1,884	121	2,811	1,372	216	25	82	440	350
Total.....							Infant deaths					
20,577							4,581					
Age at death (days)												
Total neonatal.....	13,158	135	542	3,296	48	5,318	3,138	652	65	112	1,688	267
Early neonatal (less than 7).....	10,304	96	441	2,582	34	4,104	2,482	513	46	93	1,332	212
Late neonatal (7–27).....	2,854	38	102	714	14	1,214	657	139	19	19	356	55
Postneonatal (28–364).....	7,419	98	225	2,277	38	3,006	1,442	255	39	46	754	171
Sex												
Male.....	11,391	138	436	3,069	44	4,613	2,529	495	56	82	1,345	245
Female.....	9,186	95	332	2,504	41	3,712	2,052	413	47	77	1,096	193
Period of gestation (weeks)												
Less than 37.....	13,235	122	519	3,792	50	4,996	3,099	613	64	118	1,660	296
Less than 34.....	10,920	93	448	3,255	40	3,955	2,568	502	57	103	1,366	250
Less than 28.....	8,515	71	373	2,642	28	2,914	2,019	381	50	86	1,065	212
28–31.....	1,477	11	48	368	10	626	355	76	5	10	203	25
32–33.....	929	11	28	245	2	414	194	45	2	7	98	12
34–36.....	2,315	29	71	537	9	1,042	531	111	7	15	294	46
37–41.....	7,124	106	241	1,729	34	3,241	1,449	284	39	39	770	140
37–38.....	3,460	62	114	890	18	1,543	684	139	13	13	368	64
39–40.....	3,364	41	120	782	14	1,550	702	133	23	23	372	68
41.....	300	2	6	58	2	149	63	12	3	3	31	7
42 or more.....	40	1	–	9	–	21	6	1	–	–	2	–
Not stated.....	179	4	8	43	2	66	27	9	1	1	9	2

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, 2022—Con.**

Characteristic	Non-Hispanic						Hispanic					
	Total	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
Birthweight (grams)							Infant deaths—Con.					
Less than 2,500	13,330	124	540	3,865	48	4,988	3,116	624	65	115	1,677	286
Less than 1,500	9,855	86	424	3,005	39	3,460	2,328	455	56	97	1,225	232
1,500–2,499	3,476	38	116	860	8	1,528	788	170	9	18	452	54
2,500 or more	7,034	109	221	1,645	37	3,250	1,439	275	38	42	753	150
2,500–4,499	6,946	108	217	1,628	36	3,213	1,414	273	36	42	738	147
4,500 or more	88	1	4	17	1	37	25	2	2	–	15	3
Not stated	213	–	7	64	1	86	25	8	1	1	12	2
Plurality												
Single births	18,091	220	692	4,794	83	7,315	4,106	821	98	127	2,187	392
Twin births	2,313	9	69	721	3	935	450	79	6	32	242	43
Triplet and higher-order births	173	4	6	58	–	74	26	7	–	–	12	3
Age of mother												
Younger than 15	26	1	1	9	–	9	4	2	–	–	–	–
15–19	1,418	19	8	407	3	506	392	69	6	18	191	40
20–24	4,553	64	44	1,347	11	1,790	1,041	159	17	35	568	119
25–29	5,446	56	169	1,529	33	2,223	1,177	236	24	37	615	130
30–34	5,137	51	297	1,267	22	2,275	1,019	219	27	37	539	102
35–39	3,024	34	190	775	11	1,162	706	157	26	23	392	36
40–54	973	6	59	238	5	359	242	65	3	9	136	10
Mother's place of birth												
50 states or District of Columbia	16,593	229	194	4,814	33	7,848	2,669	181	55	62	1,592	335
Elsewhere	3,471	2	565	713	51	420	1,877	723	48	95	839	95
Not stated	244	2	9	47	1	56	35	4	–	2	11	8

\* Figure does not meet National Center for Health Statistics standards of reliability; based on fewer than 20 deaths in the numerator.

– 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 were 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, 2010–2022**

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)
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 2010–2020, but ranking changed in 2020 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, 2022**

[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			White		
	Rank	Number	Rate	Rank	Number	Rate	Rank	Number	Rate	Rank	Number	Rate	Rank	Number	Rate
All causes . . . . .	...	20,577	561.0	...	233	905.9	...	768	350.7	...	5,573	1,089.7	...	8,324	452.2
Congenital malformations, deformations, and chromosomal abnormalities . . . . . (Q00–Q99)	1	4,004	109.2	1	46	178.8	1	154	70.3	2	690	134.9	1	1,834	99.6
Disorders related to short gestation and low birth weight, not elsewhere classified . . . . . (P07)	2	2,884	78.6	3	19	*	2	124	56.6	1	962	188.1	2	955	51.9
Sudden infant death syndrome . . . . . (R95)	3	1,531	41.7	2	27	105.0	7	28	12.8	3	542	106.0	4	604	32.8
Accidents (unintentional injuries) . . . . . (V01–X59)	4	1,351	36.8	4	17	*	5	31	14.2	4	417	81.5	3	620	33.7
Newborn affected by maternal complications of pregnancy . . . . . (P01)	5	1,213	33.1	5	12	*	3	68	31.1	5	350	68.4	5	400	21.7
Cause of death (based on <i>International Classification of Diseases, 10th Revision, 1992</i> )	Total Hispanic			Central and South American <sup>2</sup>			Mexican			Puerto Rican					
	Rank	Number	Rate	Rank	Number	Rate	Rank	Number	Rate	Rank	Number	Rate			
All causes . . . . .	...	4,581	488.7	...	907	436.4	...	2,442	478.6	...	438	632.3			
Congenital malformations, deformations, and chromosomal abnormalities . . . . . (Q00–Q99)	1	1,120	119.5	1	277	133.3	1	634	124.3	2	56	80.8			
Disorders related to short gestation and low birth weight, not elsewhere classified . . . . . (P07)	2	650	69.3	2	132	63.5	2	349	68.4	1	62	89.5			
Sudden infant death syndrome . . . . . (R95)	4	241	25.7	4	35	16.8	4	110	21.6	3	42	60.6			
Accidents (unintentional injuries) . . . . . (V01–X59)	5	188	20.1	9	16	*	5	96	18.8	4	32	46.2			
Newborn affected by maternal complications of pregnancy . . . . . (P01)	3	291	31.0	3	42	20.2	3	161	31.6	5	30	43.3			

... Category not applicable.

\* Figure does not meet National Center for Health Statistics standards of reliability; based on fewer than 20 deaths in the numerator.

<sup>1</sup>For infants born to Asian non-Hispanic women, Bacterial sepsis (P36.9) was the fourth leading cause of death, with 37 deaths and a rate of 16.9.

<sup>2</sup>For infants born to Central and South American women, Bacterial sepsis (P36.9) was the fifth leading cause of death, with 30 deaths and a rate of 14.6.

NOTES: Reliable cause-specific infant mortality rates cannot be computed 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, 2022**

[By place of residence]

Area	Rate (deaths per 1,000 births)	Infant deaths	Live births
United States <sup>1</sup>	5.61	20,577	3,667,758
Alabama	6.69	389	58,149
Alaska	6.62	62	9,359
Arizona	6.17	485	78,547
Arkansas	7.67	272	35,471
California	4.11	1,724	419,104
Colorado	4.54	283	62,383
Connecticut	4.25	150	35,332
Delaware	7.49	81	10,816
District of Columbia	5.45	44	8,075
Florida	5.98	1,342	224,433
Georgia	7.08	893	126,130
Hawaii	5.79	90	15,535
Idaho	5.27	118	22,391
Illinois	5.59	718	128,350
Indiana	7.16	570	79,649
Iowa	5.20	190	36,506
Kansas	5.81	200	34,401
Kentucky	5.77	302	52,315
Louisiana	7.37	416	56,479
Maine	6.37	77	12,093
Maryland	6.03	415	68,782
Massachusetts	3.32	228	68,584
Michigan	6.42	657	102,321
Minnesota	4.50	288	64,015
Mississippi	9.11	316	34,675
Missouri	6.77	467	68,985
Montana	4.65	52	11,175
Nebraska	5.83	142	24,345
Nevada	4.49	149	33,193
New Hampshire	3.48	42	12,077
New Jersey	3.57	367	102,893
New Mexico	5.88	127	21,614
New York	4.26	885	207,774
North Carolina	6.79	825	121,562
North Dakota	4.39	42	9,567
Ohio	7.11	912	128,231
Oklahoma	6.89	333	48,332
Oregon	4.48	177	39,493
Pennsylvania	5.69	741	130,252
Rhode Island	3.90	40	10,269
South Carolina	6.76	391	57,820
South Dakota	7.77	87	11,201
Tennessee	6.61	544	82,265
Texas	5.72	2,228	389,741
Utah	5.03	230	45,768
Vermont	4.89	26	5,316
Virginia	6.21	594	95,630
Washington	4.34	362	83,333
West Virginia	7.32	124	16,929
Wisconsin	5.80	348	60,049
Wyoming	5.62	34	6,049
Puerto Rico	7.38	141	19,112
Guam	10.73	27	2,517

<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 (9).

### Weighting

In 2022, a record weight was added to the U.S. linked file to compensate for the 1.4% 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 94.5% through 100.0% (Table). 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 2022 linked file initially included 20,613 infant death records. Of these records, 20,334 were linked; 279 were unlinked because corresponding birth certificates could not be identified. The 20,613 linked and unlinked records contained 31 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 20,577 infant deaths by place of residence for 2022.

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

The overall infant mortality rate of 5.61 from the 2022 period linked file is statistically the same as that from the 2022 vital statistics mortality file (5.60) (10). The number of infant deaths in the linked file (20,334) differs slightly from the number in the mortality file (20,553) (10). 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

**Table. Percentage of infant deaths linked to their corresponding birth records, by state of occurrence of death: United States and each state, 2022**

Area	Percent linked by state of occurrence of death
United States	98.6
Alabama	99.7
Alaska	100.0
Arizona	98.3
Arkansas	100.0
California	98.0
Colorado	99.7
Connecticut	100.0
Delaware	100.0
District of Columbia	100.0
Florida	99.9
Georgia	100.0
Hawaii	100.0
Idaho	100.0
Illinois	99.9
Indiana	99.7
Iowa	100.0
Kansas	100.0
Kentucky	97.7
Louisiana	98.1
Maine	98.7
Maryland	100.0
Massachusetts	99.6
Michigan	99.1
Minnesota	100.0
Mississippi	100.0
Missouri	98.5
Montana	100.0
Nebraska	97.8
Nevada	99.3
New Hampshire	100.0
New Jersey	97.1
New Mexico	97.2
New York	99.1
New York City	100.0
North Carolina	98.1
North Dakota	100.0
Ohio	99.9
Oklahoma	99.4
Oregon	100.0
Pennsylvania	95.8
Rhode Island	100.0
South Carolina	100.0
South Dakota	100.0
Tennessee	100.0
Texas	94.5
Utah	100.0
Vermont	100.0
Virginia	99.6
Washington	100.0
West Virginia	99.1
Wisconsin	100.0
Wyoming	100.0

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

menses (11). 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 (11).

## 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 World Health Organization regulations, which specify that member nations classify and code causes of death according to 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* (12,13).

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 (14,15).

## 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”* (16).

## 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).

## 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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