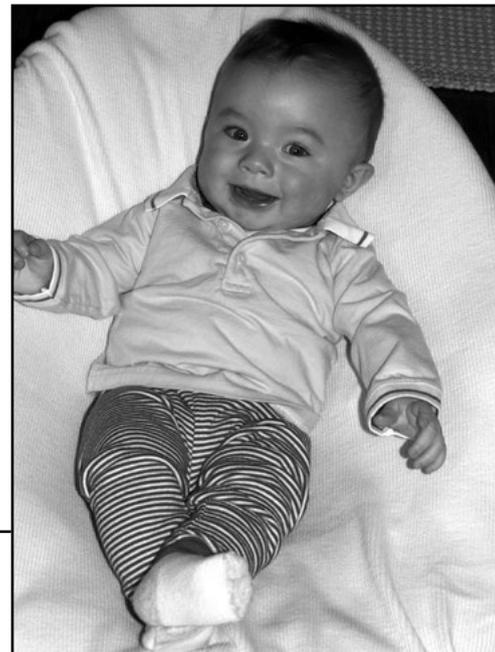


HEALTH STATUS - INFANTS



LOW BIRTH WEIGHT AND VERY LOW BIRTH WEIGHT

Infants born at low birth weight (less than 2,500 grams or 5.5 pounds) and especially very low birth weight (less than 1,500 grams or 3.25 pounds) are more likely to experience physical and developmental health problems and to die in the first year of life than are infants of normal birth weight. The developmental problems of low birth weight infants exact a significant emotional and financial toll, often requiring increased levels of medical, educational, and parental care. The majority of very low birth weight infants are born prematurely, whereas those born at moderately low birth weight include a mix of prematurity as well as fetal

growth restriction that may be related to factors such as maternal hypertension, tobacco smoke exposure, or inadequate weight gain during pregnancy.¹⁴

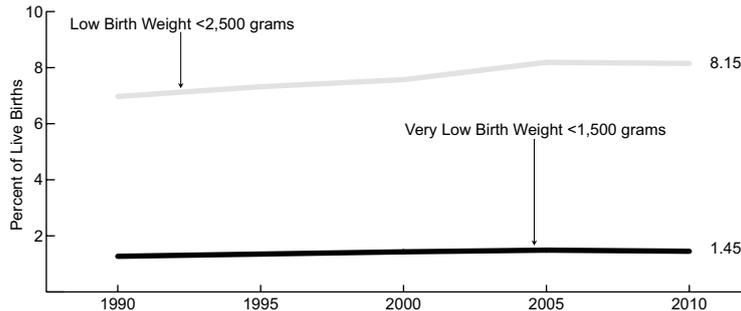
In 2010, 8.15 percent of infants were born at low birth weight, including 1.45 percent who were born at very low birth weight. After steady increases, rates of low and very low birth weight peaked in 2006 at 8.26 and 1.49 percent, respectively, and have declined only slightly since then. Reasons for the increase in low birth weight may mirror those behind increases in prematurity, including increases in obstetric interventions, maternal age, and fertility treatments.¹⁵ A rise in multiple births, which increase with maternal age and fertility treatments

and are at high risk of low birth weight, has strongly influenced the rise in low birth weight; however, rates of low birth weight have also increased for singleton births.¹⁵

Infants born to non-Hispanic Black women have the highest rates of low and very low birth weight (13.53 and 2.98 percent, respectively), levels that are about two or more times greater than for infants born to women of other racial and ethnic groups. For example, low and very low birth weight rates among non-Hispanic Whites were 7.14 and 1.16 percent, respectively. Given their heightened risk of death, the large disparity in very low birth weight is a major contributor to the mortality gap between non-Hispanic Black and White infants.¹⁶

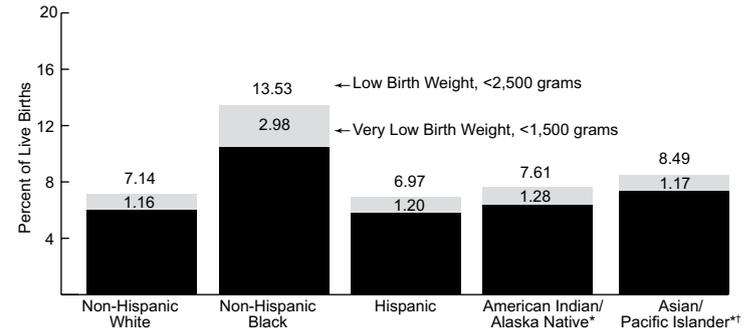
Low and Very Low Birth Weight, 1990—2010

Source (II.1, II.2): Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System



Low and Very Low Birth Weight, by Maternal Race/Ethnicity,* 2010

Source (II.1): Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System



*Includes Hispanics. †Separate data for Asians and Native Hawaiians and Other Pacific Islanders not available.

PRETERM BIRTH

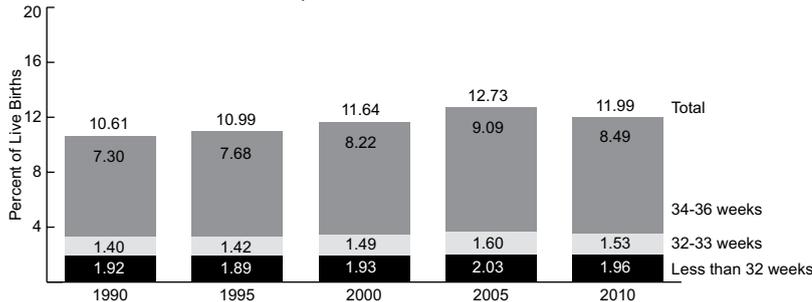
Babies born preterm, before 37 completed weeks of gestation, are at increased risk of immediate and long-term complications, as well as death. Complications that can occur during the newborn period include respiratory distress, jaundice, anemia, and infection, while long-term complications can include learning and behavioral problems, cerebral palsy, lung problems, and vision and hearing loss. As a result of these risks, preterm birth is a leading cause of infant death and childhood disability. Although the risk of complications is greatest among those babies who are born the earliest, even those babies born “late preterm” (34 to 36 weeks of gestation) are more likely than full-term babies to experience morbidity and mortality.¹⁷

In 2010, 11.99 percent of infants were born preterm. Overall, 8.49 percent of babies were born at 34 to 36 weeks’ gestation, 1.53 percent were born at 32-33 weeks, and 1.96 percent were “very preterm” (less than 32 weeks). Between 1990 and 2006, the preterm birth rate increased more than 20 percent, from 10.61 to 12.80 percent, but has declined in the 4 years since 2006 (data not shown). The greatest trends in preterm birth have been observed among the largest category of late preterm infants born at 34 to 36 weeks’ gestation. For example, late preterm birth decreased by 7.1 percent from 2006 to 2010 (9.14 to 8.49 percent) while very preterm birth decreased by only 3.4 percent during the same time period (2.04 to 1.97 percent).

The preterm birth rate varies by race and ethnicity. In 2010, 17.12 percent of babies born to non-Hispanic Black women were born preterm, compared to 10.69 percent of babies born to Asian/Pacific Islander women. Among babies born to non-Hispanic White women, 10.77 percent were born preterm, while the same was true of 11.79 percent of babies born to Hispanic women and 13.60 percent of babies born to American Indian/Alaska Native women. The causes of preterm birth are not well understood but are linked to infection and vascular disease, as well as medical conditions, such as diabetes and hypertension, which may necessitate labor induction or cesarean delivery.¹⁸

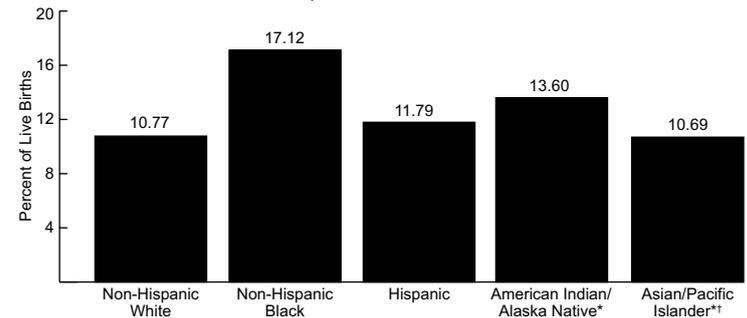
Preterm Birth, by Completed Weeks of Gestation, 1990–2010

Source (II.1, II.3): Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System



Preterm Birth, by Maternal Race/Ethnicity,* 2010

Source (II.1): Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System



*Includes Hispanics. **Separate data for Asians and Native Hawaiians and Other Pacific Islanders not available.

BREASTFEEDING

Breastfeeding has been shown to promote the health and development of infants, as well as their immunity to disease. It also confers a number of maternal benefits, such as a decreased risk of breast and ovarian cancers.¹⁹ The American Academy of Pediatrics Section on Breastfeeding recommends exclusive breastfeeding—with no supplemental food or liquids—through the first 6 months of life, and continued supplemental breastfeeding through at least the first year.²⁰

Breastfeeding practices vary considerably by a number of factors including maternal age, maternal education, household income, and

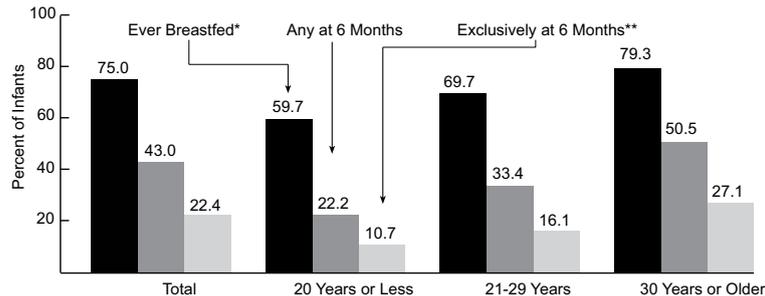
race/ethnicity.²¹ Among infants born in 2007, 75.0 percent were breastfed or fed breastmilk at least once. While this represents a substantial increase in breastfeeding initiation over the past 25 years, the overall prevalence of any breastfeeding for 6 months and the prevalence of exclusive breastfeeding for 6 months remain below national objectives.²² Less than half (43.0 percent) of infants born in 2007 were breastfed for 6 months and only 22.4 percent were exclusively breastfed.

Children born to mothers aged 30 years or older were the most likely to have been breastfed

(79.3 percent), while children born to mothers aged 20 years or younger were the least likely to (59.7 percent). A similar pattern exists for exclusive breastfeeding, as 27.1 percent of children born to mothers aged 30 years or older were exclusively breastfed for 6 months compared to 10.7 percent of children born to mothers aged 20 years or less. Increased maternal education is also associated with successful breastfeeding practices. Mothers who had graduated from college were more likely to both initiate breastfeeding and to breastfeed for 6 months exclusively than those with less education.

Breastfeeding Among Children Born in 2007, by Maternal Age and Duration

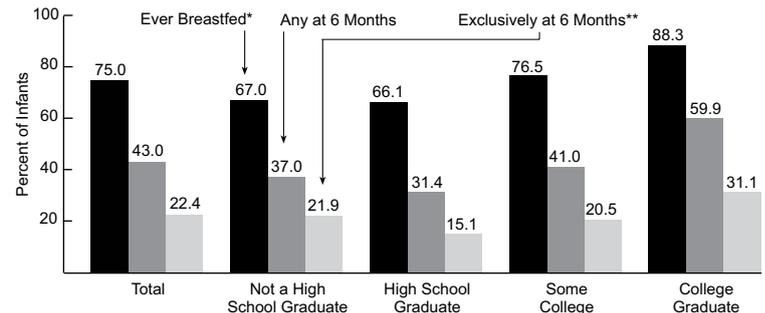
Source (II.4): Centers for Disease Control and Prevention, National Immunization Survey



*Reported that child was ever breastfed or fed human breastmilk. **Exclusive breastfeeding is defined as only human breastmilk—no solids, water, or other liquids.

Breastfeeding Among Children Born in 2007, by Maternal Education and Duration

Source (II.4): Centers for Disease Control and Prevention, National Immunization Survey



*Reported that child was ever breastfed or fed human breastmilk. **Exclusive breastfeeding is defined as only human breastmilk—no solids, water, or other liquids.

PREGNANCY-RELATED MORTALITY

A pregnancy-related death is defined as a death which occurs during or within 1 year after the end of a pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes such as injury.²³ This definition includes more deaths than the traditional definition of maternal mortality, which counts pregnancy-related deaths only up to 42 days after the end of pregnancy. Although maternal mortality in the United States declined dramatically over the last century, this trend has reversed somewhat in the last several decades, and racial and ethnic disparities in both maternal and pregnancy-related

mortality persist.^{24,25,26}

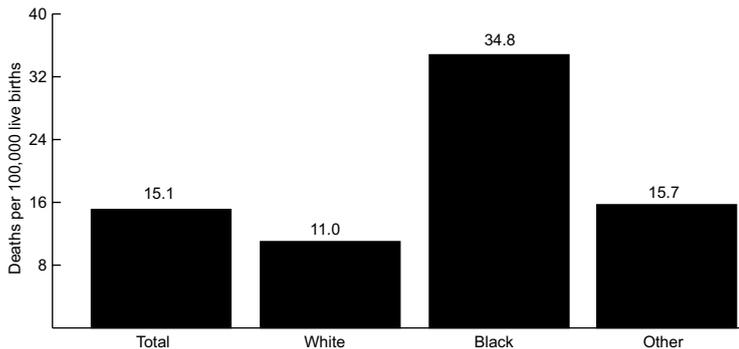
In 2006–2007, the latest years for which data are available, a total of 1,294 deaths were found to be pregnancy-related (15.1 deaths per 100,000 live births). This represents a substantial increase from 1987 levels of 7.2 pregnancy-related deaths per 100,000 live births.²⁶ However, the extent to which this increase may reflect improved identification and coding of pregnancy-related deaths is unclear.²⁵ The pregnancy-related mortality ratio among Black women was approximately 3.2 times the rate for White women in 2006–2007 (34.8 versus 11.0 per 100,000), a disparity that has remained relatively constant. The pregnancy-related mortality ratio also increased with age. Women aged 35–

39 years were more than twice as likely to die from pregnancy-related causes as women aged 20–24; for women older than 39 years, the risk increased five-fold (data not shown).²⁵

Some of the most common causes of pregnancy-related death in 2006–2007 were cardiovascular disease (13.5%), diseases of the heart muscle (cardiomyopathy, 12.6%), uncontrolled bleeding (hemorrhage, 11.9%), and non-cardiovascular medical conditions (11.8%). In 1987–1990, hemorrhage was the leading cause of pregnancy-related deaths (29%); hypertensive disorders of pregnancy, including preeclampsia and eclampsia, accounted for almost 18 percent of pregnancy-related deaths, compared to 11.1 percent in 2006–2007.^{23,26}

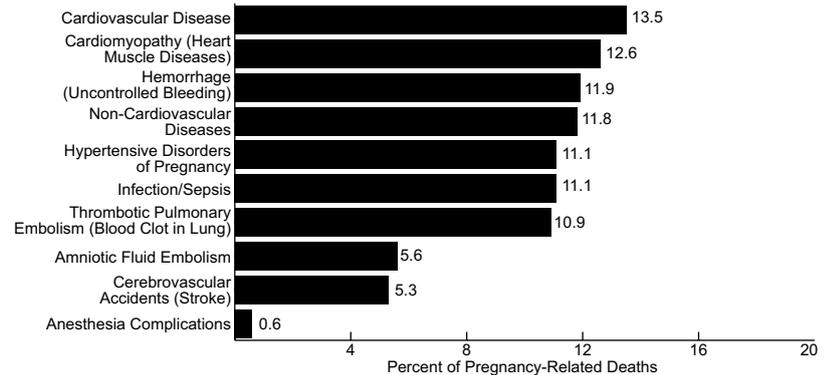
Pregnancy-Related Mortality Ratios, by Race, 2006–2007

Source (II.5): Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Pregnancy Mortality Surveillance System



Leading Causes of Pregnancy-Related Deaths,* 2006–2007

Source (II.5): Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Pregnancy Mortality Surveillance System



*The cause of death was unknown for 5.6% of all pregnancy-related deaths.

INFANT MORTALITY

In 2010, 24,586 infants died before their first birthday, reflecting an infant mortality rate of 6.15 deaths per 1,000 live births. This represents a decrease of 3.8 percent from the 2009 rate (6.39 deaths per 1,000 live births) and 10.5 percent from the 2005 rate (6.87 per 1,000 live births).

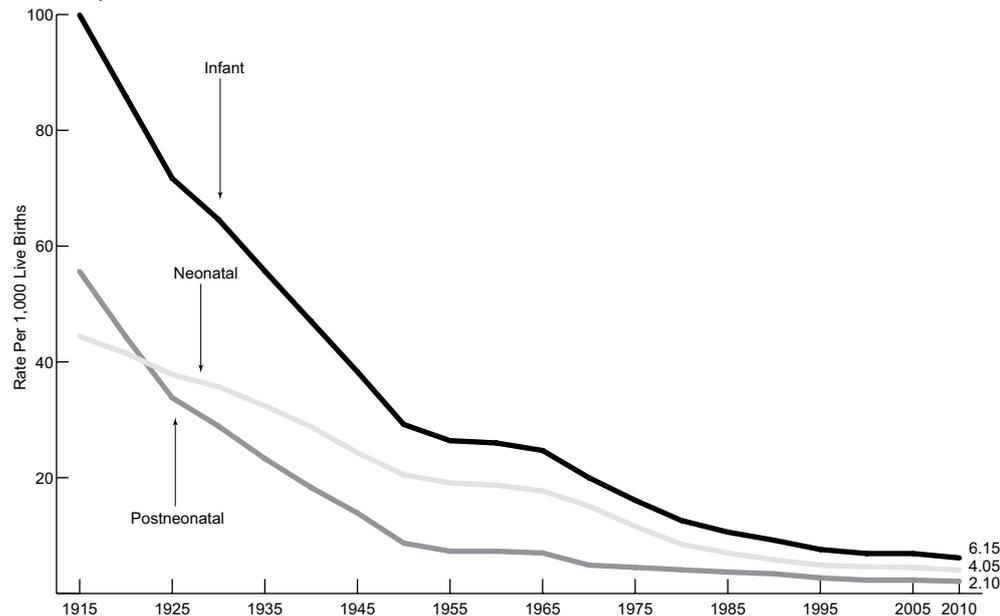
Currently, about two-thirds of infant deaths in the United States occur before 28 days (neonatal mortality: 4.05 per 1,000 live births), with the remaining third occurring in the postneonatal period between 28 days and under 1 year (2.10 per 1,000 live births). Neonatal mortality is generally related to short gestation and low birth

weight, maternal complications of pregnancy, and congenital malformations, while postneonatal mortality is generally related to Sudden Infant Death Syndrome (SIDS), congenital malformations, and unintentional injuries.²⁷ In 2010, the leading causes of infant mortality were congenital malformations, followed by disorders related to short gestation and low birth weight, and SIDS.²⁸

With the exception of 2000 to 2005, infant mortality had been consistently declining at least every few years since it was first assessed in 1915. The substantial infant mortality decline over the 20th century has been attributed to economic growth, improved nutrition, and new sanitary measures, as well as advances in clinical medicine and access to care.^{29,30} Infant mortality declines in the 1990s were aided particularly by the approval of synthetic surfactants to reduce the severity of respiratory distress syndrome (RDS), a common affliction of preterm infants, and the recommendation that infants be placed on their backs to sleep to prevent Sudden Infant Death Syndrome (SIDS). The lack of progress between 2000 and 2005 has been attributed to increases in preterm birth,³¹ which have begun to decline in the last several years, perhaps due to practice-based efforts to reduce preterm deliveries that are not medically necessary.³²

Infant, Neonatal, and Postneonatal Mortality Rates,* 1915-2010**

Source (II.6, II.7, II.8): Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System



*Infant deaths are under 1 year; neonatal deaths are under 28 days; postneonatal deaths are between 28 days and under 1 year.

**Data from 1915-1932 are a subset from states with birth registration, which became 100% by 1933.

Despite improvements in infant mortality over time, disparities by race and ethnicity persist. Due to inconsistencies in the reporting of race and ethnicity on the birth and death certificate, infant mortality rates by race and ethnicity are more accurately assessed from maternal race and ethnicity, which is achieved by linking infant death certificates to their correspond-

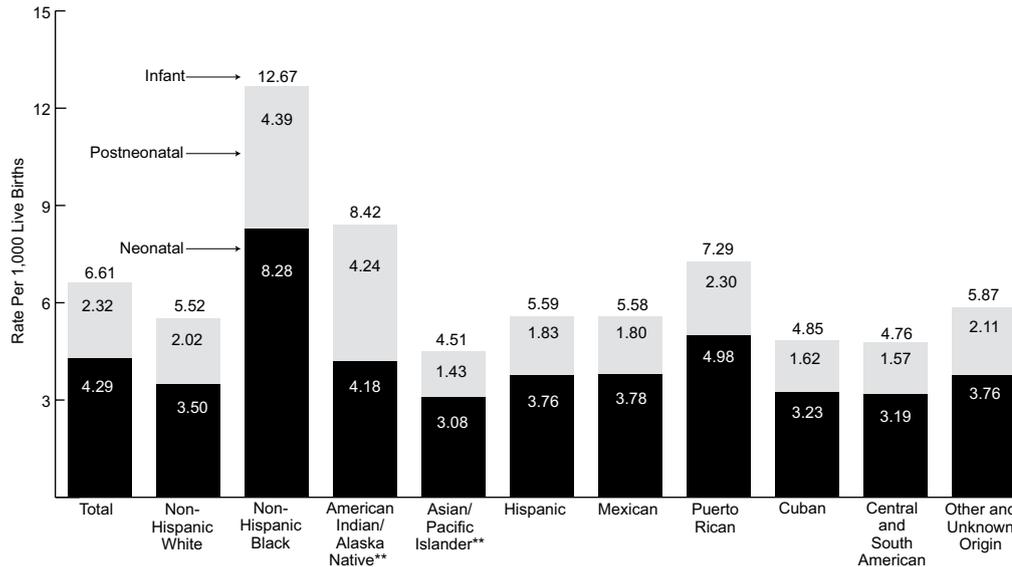
ing birth certificates. In 2008, the latest year for which linked data are available, the infant mortality rate was highest for infants of non-Hispanic Black mothers (12.67 per 1,000 live births)—a rate 2.3 times that of non-Hispanic Whites (5.52 per 1,000 live births)—a rate 2.3 times that of non-Hispanic Whites (5.52 per 1,000). Infant mortality was also higher among infants born to American Indian/Alaska Native and Puerto Rican moth-

ers (8.42 and 7.29 per 1,000, respectively). Although infant mortality was lowest among Asian/Pacific Islanders (4.51 per 1,000), there is considerable variability within this population and higher infant mortality rates have been shown among Native Hawaiians.³³

Similar to overall infant mortality, neonatal mortality was highest among infants of non-Hispanic Black mothers (8.28 per 1,000), followed by Puerto Rican and American Indian/Alaska Native mothers (4.98 and 4.18 per 1,000, respectively). Postneonatal mortality was more than twice as high for both non-Hispanic black and American Indian/Alaska Native mothers (4.39 and 4.24 per 1,000, respectively) than for non-Hispanic Whites (2.02 per 1,000). Consistent with these patterns in the timing of excess infant mortality, the majority of the infant mortality disparity for non-Hispanic Blacks compared to non-Hispanic Whites is due to causes related to prematurity and, to a lesser extent, SIDS, congenital malformations, and injury.^{34,35} The American Indian/Alaska Native infant mortality gap is mostly explained by SIDS, congenital malformations, and injury while the excess among Puerto Rican mothers is almost entirely related to prematurity.^{34,35}

Infant, Neonatal, and Postneonatal Mortality Rates,* by Race/Ethnicity, 2008

Source (II.9): Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System



*Infant deaths are under 1 year; neonatal deaths are under 28 days; postneonatal deaths are between 28 days and under 1 year.

**Includes Hispanics

INTERNATIONAL INFANT MORTALITY

In 2008, the U.S. infant mortality rate (6.6 infant deaths per 1,000 live births) was higher than the rate for many other industrialized nations. Differences in infant mortality rates among industrialized nations may reflect variation in the definition, measurement, and reporting of fetal and infant deaths. However, recent analyses of the differences in gestational age-specific infant mortality indicate that this disparity is most likely related to the high rate of preterm birth in the United States.³⁶ Infants born preterm (or less than 37 weeks gestation) have higher rates of death and disability than infants born at term (37 weeks gestation or more).³⁷ Although the United States compares favorably with European countries with respect to the survival of preterm infants, the higher rate of preterm birth in the United States overall significantly impacts the infant mortality rate.

In 2008, the United States ranked 28th in infant mortality among industrialized nations. In comparison, Iceland and Sweden, both with infant mortality rates of 2.5 deaths per 1,000 live births, were ranked first, followed by Finland and Japan, both with a rate of 2.6 deaths per 1,000. The United States did not always rank this low; in 1960, it ranked 12th, with Iceland, Norway and the Netherlands reporting the three lowest rates among industrialized nations that year.

International Infant Mortality Rates and Rankings,* Selected Countries,** 1960 and 2008

Source (II.10): The Organization for Economic Co-operation and Development (OECD)

Country	Rank 1960	Rank 2008
Australia	6	21
Austria	20	13
Belgium	18	13
Canada	13	24
Chile	28	29
Czech Republic	5	7
Denmark	9	19
Finland	7	3
France	14	15
Germany	19	11
Greece	21	5
Hungary	24	25
Iceland	1	1
Ireland	16	15
Israel	---	15
Italy	23	8
Japan	17	3
Mexico	27	30
Netherlands	3	15
New Zealand	11	23
Norway	2	5
Poland	25	25
Portugal	26	8
Republic of Korea	---	11
Slovak Republic	15	26
Spain	22	8
Sweden	4	1
Switzerland	8	19
Turkey	29	30
United Kingdom	10	22
United States	12	28

*Rankings are from lowest to highest infant mortality rates (IMR). Countries with the same IMR receive the same rank.

**Countries with at least 2.5 million population and listed in the OECD database.

--- Data not available.