

HEALTH STATUS - INFANTS



LOW BIRTH WEIGHT

Low birth weight is a leading cause of neonatal mortality (death before 28 days of age). Low birth weight infants are more likely to experience physical and developmental health problems or die during the first year of life than are infants of normal weight.^{1,2}

According to preliminary data, 8.2 percent of infants were born low birth weight (less than 2,500 grams, or 5 pounds 8 ounces) in 2009. In 2006, the rate of low birth weight was the highest recorded in four decades (8.3 percent). The increase in multiple births, which are at high risk of low birth weight, strongly influenced this increase; however, rates of low birth weight also rose for singleton births.³

In 2009, the rate of low birth weight was much higher among infants born to non-Hispanic Black women (13.6 percent) than infants born to mothers of other racial/ethnic groups. The second highest rate, which occurred among Asian/Pacific Islanders, was 8.3 percent, followed by a rate of 7.3 percent among American Indian/Alaska Natives. Low birth weight occurred among 7.2 percent of infants born to non-Hispanic White women, while infants of Hispanic women experienced the lowest rate (6.9 percent). Low birth weight levels in 2009 were not significantly different from 2008 for non-Hispanic White, non-Hispanic Black, and Hispanic infants.

Low birth weight also varied by maternal age. In 2008 (the latest year for which data are available), the rate of low birth weight was highest among babies born to women younger than 15 years of age (12.4 percent), followed by babies born to women aged 40–54 years (11.8 percent). The lowest rates occurred among babies born to mothers aged 25–29 years and 30–34 years (7.4 and 7.6 percent, respectively; data not shown).

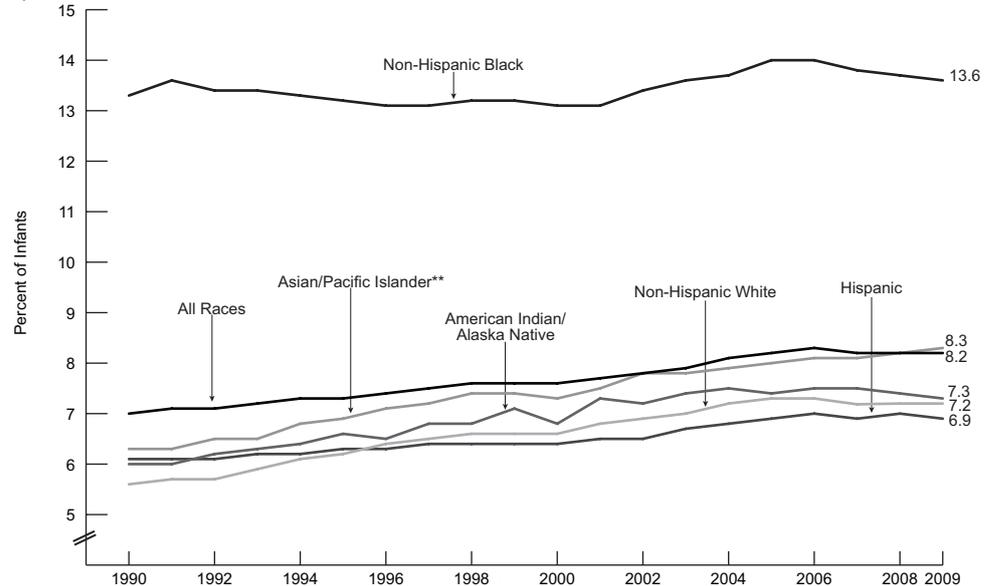
1 Stein REK, Siegel MJ, Bauman LJ. Are children of moderately low birth weight at increased risk for poor health? A new look at an old question. *Pediatrics* 2006;118:217-223.

2 Matthews TJ, MacDorman MF. Infant mortality statistics from the 2006 period linked birth/infant death data set. *National vital statistics reports; vol 58 no 17*. Hyattsville, MD: National Center for Health Statistics. 2010.

3 Martin JA, Hamilton BE, Sutton PD, Ventura SJ, et al. *Births: Final data for 2006*. *National vital statistics reports; vol 57 no 7*. Hyattsville, MD: National Center for Health Statistics. 2009.

Low Birth Weight Among Infants, by Maternal Race/Ethnicity, 1990–2009*

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



*Data for 2009 are preliminary. **Separate estimates for Asians and Native Hawaiians and Other Pacific Islanders were not available.

VERY LOW BIRTH WEIGHT

According to preliminary data, 1.5 percent of infants were born very low birth weight (less than 1,500 grams, or 3 pounds 4 ounces) in 2009. The proportion of very low birth weight infants has slowly climbed from just over 1 percent in 1980.

Infants born at such low weight are more than 100 times more likely to die in the first year of life than are infants of normal birth weight (above 5 pounds 8 ounces).¹ Very low birth weight infants who survive are at a significantly increased risk of severe health and developmental problems, including physical and sensory difficulties, developmental delays, and cognitive impairment, which may require increased levels of medical, educational, and parental care.²

Infants born to non-Hispanic Black women are over two times more likely than infants born to mothers of other racial/ethnic groups to be very low birth weight. Among infants born to non-Hispanic Black women, 3.1 percent were very low birth weight in 2009, compared to 1.2 percent of infants born to non-Hispanic White and Hispanic women, 1.3 percent born to American Indian/Alaska Native women, and 1.1 percent born to Asian/Pacific Islander women. This difference is a major contributor to the disparity in infant mortality rates between non-Hispanic Black infants and infants of other racial/ethnic groups.³ Although, overall, the rate of very low birth weight was not statistically different from

2008, rates for non-Hispanic White and non-Hispanic Black newborns were down 2-3 percent from 2006.⁴

In 2008 (the latest year for which data are available), the rate of very low birth weight was highest among babies born to mothers aged 45-54 years (3.6 percent). Mothers under 15 years of age also had high rates of very low birth weight (3.0 percent.) The rate was lowest among mothers aged 25-29 years (1.3 percent; data not shown).

1 Matthews TJ, MacDorman MF. *Infant mortality statistics from the 2006 period linked birth/infant death data set. National vital statistics reports; vol 58 no 17.* Hyattsville, MD: National Center for Health Statistics. 2010.

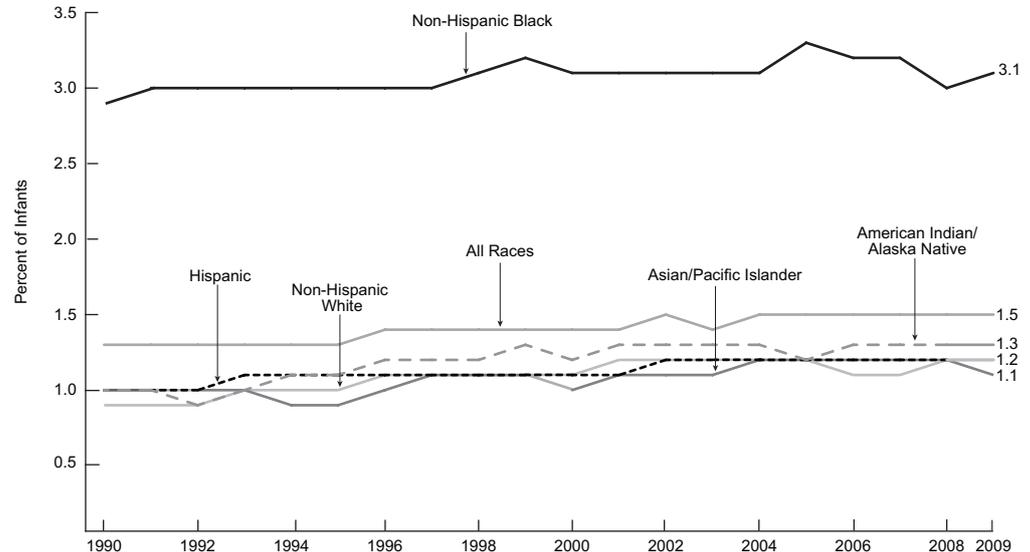
2 Eichenwald EC, Stark AR. *Management and outcomes of very low birth weight.* N Engl J Med 2008;358:1700-1711.

3 Wise PH. *The anatomy of a disparity in infant mortality.* Annu Rev Public Health. 2003;24:341-62.

4 Hamilton BE, Martin JA, Ventura SJ. *Births: Preliminary data for 2009. National vital statistics reports web release; vol 59 no 3.* Hyattsville, MD: National Center for Health Statistics. 2010.

Very Low Birth Weight Among Infants, by Maternal Race/Ethnicity, 1990–2009*

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



*Data for 2009 are preliminary. **Separate estimates for Asians and Native Hawaiians and Other Pacific Islanders were 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 mortality. 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. 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’ ges-

tation) are more likely than full-term babies to experience these types of problems.¹

According to preliminary data, 12.2 percent of infants were born preterm in 2009. Overall, 8.7 percent of babies were born at 34 to 36 weeks’ gestation, 1.6 percent were born at 32-33 weeks, and 2.0 percent were “very preterm” (less than 32 weeks). The preterm birth rate increased more than 20 percent from 1990 to 2006, but has declined in the three years since (data not shown).

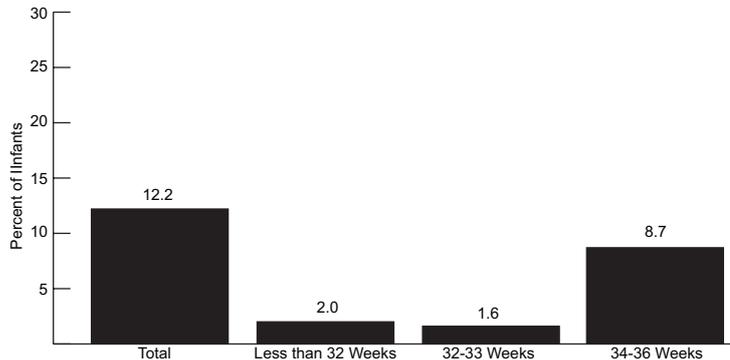
The preterm birth rate varies by race/ethnicity. In 2009, 17.5 percent of babies born to

non-Hispanic Black women were born preterm, compared to 10.8 percent of babies born to Asian/Pacific Islander women. Among babies born to non-Hispanic White women, 10.9 percent were born preterm, while the same was true of 12.0 percent of babies born to Hispanic women and 13.5 percent of babies born to American Indian/Alaska native women.

1 Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Reproductive Health. Prematurity. November 2009. Available online: <http://www.cdc.gov/Features/PrematureBirth/>. Accessed March 2011.

Preterm Birth Among Infants, by Completed Weeks of Gestation, 2009*

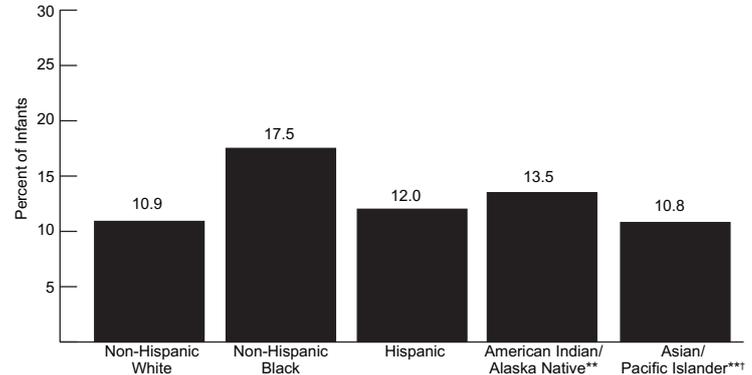
Source (II.1): Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System



*Data for 2009 are preliminary

Preterm Birth Among Infants, by Maternal Race/Ethnicity, 2009*

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



*Data for 2009 are preliminary. **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, including their immunity to disease. It also confers a number of maternal benefits, such as a decreased risk of breast and ovarian cancers.¹ 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.²

Breastfeeding practices vary considerably by a number of factors including maternal age, maternal education, household income, and race/ethnicity. In 2007, the parents of 75.5 percent of children from birth to 5 years of age reported that

the child had ever been breastfed or fed breast milk. 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.³ Parents of 45.0 percent of children aged 6 months to 5 years reported that the child was breastfed for 6 months. Exclusive breastfeeding for 6 months was reported for 12.4 percent of children aged 6 months to 5 years.

Children born to mothers aged 30 years or older are the most likely to be breastfed (79.8 percent), while children born to mothers aged 20 years or younger are the least likely (58.5 percent). A similar trend exists for exclusive breast-

feeding; 14.1 percent of children born to mothers aged 30 years or older are exclusively breastfed for 6 months compared to 4.6 percent of children born to mothers aged 20 years or younger. Mothers with more than a high school education are more likely to both initiate breastfeeding and to breastfeed for 6 months exclusively than those with less than a high school education.

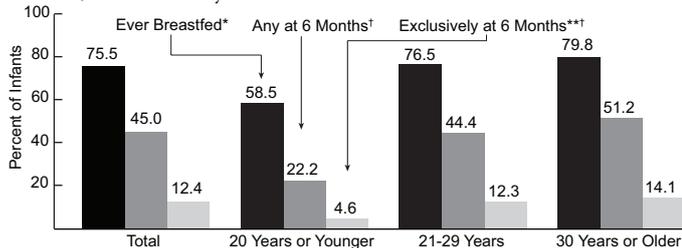
1 Ip S, Chung M, Raman G, Chew P, Magula N, DeVine D, et al. *Breastfeeding and maternal and infant health outcomes in developed countries*. Evid Rep Technol Assess (Full Rep). 2007(153):1-186.

2 Gartner LM, Morton J, Lawrence RA, Naylor AJ, O'Hare D, Schanler RJ, et al. *Breastfeeding and the use of human milk*. Pediatrics. 2005;115(2):496-506.

3 U.S. Department of Health and Human Services. *Healthy People 2020*. Available at: www.healthypeople.gov. Accessed March 2011.

Breastfeeding Among Children Aged 0-5 Years, by Maternal Age and Duration, 2007

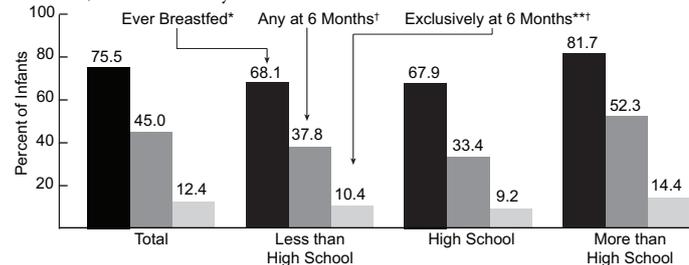
Source (II.2): Health Resources and Services Administration, Maternal and Child Health Bureau and Centers for Disease Control and Prevention, National Center for Health Statistics, National Survey of Children's Health



*Ever fed breast milk. **Exclusive breastfeeding is defined as only human breastmilk—no solids, water, or other liquids. †Data is for infants aged 6 months to 5 years. Those less than 6 months of age were excluded.

Breastfeeding Among Children Aged 0-5 Years, by Maternal Education and Duration, 2007

Source (II.2): Health Resources and Services Administration, Maternal and Child Health Bureau and Centers for Disease Control and Prevention, National Center for Health Statistics, National Survey of Children's Health



*Ever fed breast milk. **Exclusive breastfeeding is defined as only human breastmilk—no solids, water, or other liquids. †Data is for infants aged 6 months to 5 years. Those less than 6 months of age were excluded.

INFANT MORTALITY

Based on preliminary data, in 2009, 26,531 infants died before their first birthday, representing an infant mortality rate of 6.42 deaths per 1,000 live births. This represents a decrease of 2.6 percent from the preliminary estimate in 2008 (6.59 deaths per 1,000 live births). The leading causes of infant mortality were congenital malformations, followed by disorders related to short gestation and low birth weight, and Sudden Infant Death Syndrome (data not shown). Although overall there were no changes in the ranking of leading causes of infant death, the infant mortality rate decreased for 2 of 10 leading causes of infant death between 2008 and 2009: maternal complications of pregnancy and unintentional injuries. The infant mortality rates associated with each of these causes declined by 7.5 and 8.5 percent, respectively.

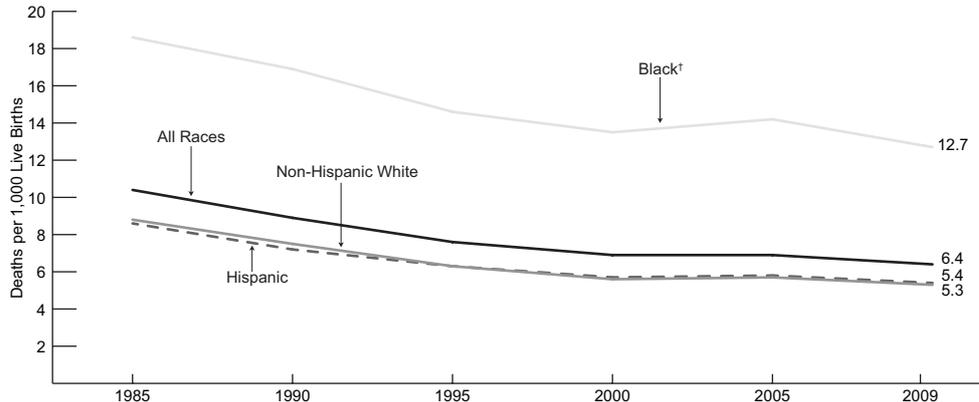
The infant mortality declined substantially during the 20th century resulting in a 93 percent decrease in the overall infant mortality rate between 1915 and 1998.¹ Some factors which contributed to this decline included economic growth, improved nutrition, and new sanitary measures, as well as advances in clinical medicine and access to care.² More recent declines in birth-weight-specific infant mortality rates in the latter part of the 20th century have been attributed, in part, to the approval of synthetic surfactants to reduce the severity of respiratory distress syn-

drome³ and the recommendation that infants be placed on their backs to sleep to prevent Sudden Infant Death Syndrome.⁴

In 2009, the mortality rate among infants born to Black women (including Hispanics) was 12.71 deaths per 1,000 live births, compared to 12.68 per 1,000 live births in 2008; this difference was not statistically significant. Despite the overall decrease in the infant mortality rate, in 2009 the rate for Blacks (including Hispanics) was still 2.4 times the rate among infants born to non-Hispanic White women (5.32 per 1,000 births). The 2009 rate for infants born to non-Hispanic white women reflects a 4.0 percent decrease since the previous year (5.54 infant deaths per 1,000 live births).

Infant Mortality Rates, * by Maternal Race/Ethnicity, 1985-2009**

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



*Under 1 year of age. **Data for 2009 are preliminary. †Including Hispanics who identify themselves as Black.

The Maternal and Child Health Block Grant and MCHB's Healthy Start program provide health and support services to pregnant women and infants with the goal of improving children's health outcomes and reducing infant and child mortality.

1 Guyer B, Freedman MA, Strobino DM, and Sondik EJ. *Annual summary of vital statistics: trends in the health of Americans during the 20th century*. Pediatrics. 2000;106:1307-17.

2 Centers for Disease Control and Prevention. *Advancements in public health, 1900-1999: healthier mothers and babies*. MMWR. 1999; 48:849-58.

3 Schoendorf KC and JL Kiely. *Birth weight and age-specific analysis of the 1990 US infant mortality drop: was it surfactant?* Arch Pediatr Adolesc Med. 1997;151:129-134

4 American Academy of Pediatrics Task Force on Infant Positioning and SIDS. *Positioning and SIDS*. Pediatrics. 1992;87:1120-6.

NEONATAL AND POSTNEONATAL MORTALITY

Neonatal. According to preliminary data, in 2009, 17,298 infants died before reaching 28 days of age, representing a neonatal mortality rate of 4.19 deaths per 1,000 live births. Although this represents a 1.9 percent decrease from 4.27 per 1,000 live births in 2008, this change was not statistically significant.

Neonatal mortality is generally related to short gestation and low birth weight, congenital malformations, and conditions originating in the perinatal period, such as maternal complications related to pregnancy or complications experienced by the newborn resulting from birth.¹

Neonatal mortality rates vary by race and ethnicity. Based on preliminary data for 2009, the neonatal mortality rate among infants born to Black women (including Hispanics) was 8.20 per 1,000 live births, more than twice the rate among infants born to non-Hispanic White and Hispanic women (3.43 and 3.62 per 1,000, respectively).

Postneonatal. In 2009, 9,233 infants died between the ages of 28 days and 1 year, representing a postneonatal mortality rate of 2.24 deaths per 1,000 live births. This represents a 3.4 percent decrease since 2008, when the postneonatal mortality rate was 2.32 deaths per 1,000 live births.

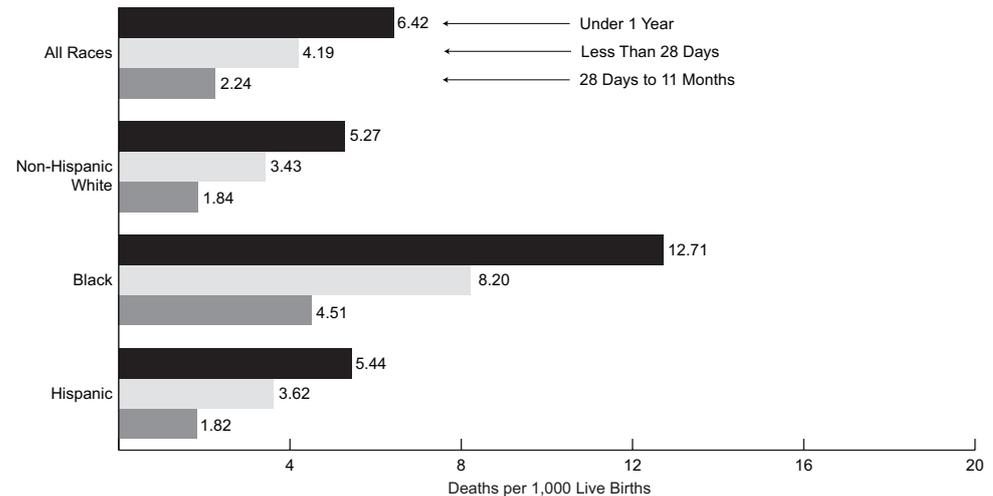
Postneonatal mortality is generally related to Sudden Infant Death Syndrome (SIDS), congenital malformations, and unintentional injuries.¹ Postneonatal mortality varies by race and ethnicity. According to preliminary data in 2009, the highest rate of postneonatal mortality was reported among infants born to

Black (including Hispanic) women (4.51 deaths per 1,000 live births). Rates for infants born to non-Hispanic White and Hispanic women were 1.84 and 1.82 deaths per 1,000 live births, respectively.

1 Centers for Disease Control and Prevention. Quick Stats: Leading Causes of Neonatal and Postneonatal Deaths — United States, 2002. MMWR. 2005; 54(38):966.

Neonatal and Post Neonatal Mortality Rates, by Maternal Race/Ethnicity, 2009*

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



*Data for 2009 are preliminary.

INTERNATIONAL INFANT MORTALITY

In 2007, the U.S. infant mortality rate (6.8 infant deaths per 1,000 live births) was higher than that of 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 U.S.¹ 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).² Although the United States compares favorably with European countries with respect to the survival of infants born preterm, the higher rate of preterm birth in the U.S. overall has a significant impact on the infant mortality rate.

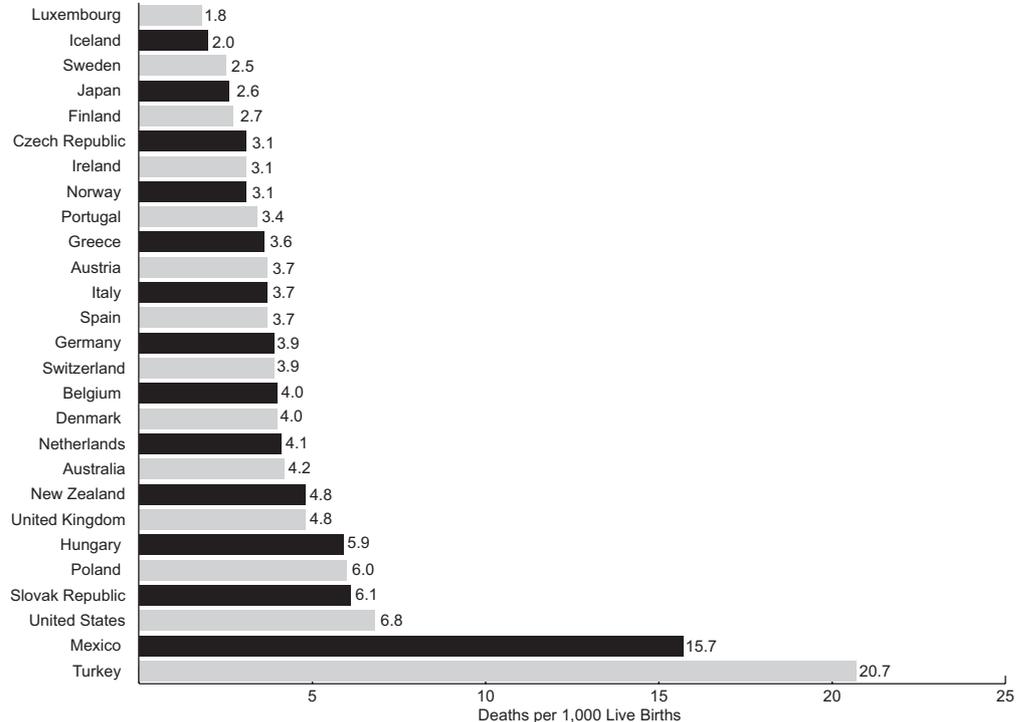
In 2007, the U.S. infant mortality rate was more than twice that of nine other industrialized countries (Luxembourg, Iceland, Sweden, Japan, Finland, Czech Republic, Ireland, Norway, and Portugal). Luxembourg had the lowest rate (1.8 per 1,000), followed by Iceland and Sweden (2.0 and 2.5 deaths per 1,000 live births, respectively).

1 MacDorman MF and Mathews TJ. *Behind international rankings of infant mortality: how the US compares with Europe*. *Int J Health Serv*. 2010;40(4):577-88.

2 MacDorman, MF, and Mathews, TJ. *Recent Trends in Infant Mortality in the United States*. *NCHS Data Brief No. 9*. National Center for health Statistics, Hyattsville, MD, 2008.

International Infant Mortality Rates, Selected Countries,* 2007

Source (II.4): The Organization for Economic Co-operation and Development (OECD)



*2007 data were not available for all Organization for Economic Co-operation and Development (OECD) countries.

MATERNAL MORTALITY

Maternal mortality, or death due to maternal causes, includes deaths due to causes related to or aggravated by pregnancy or pregnancy management, and excludes deaths occurring more than 42 days after the end of the pregnancy and deaths of pregnant women due to external causes (such as injury).¹ The rate of maternal mortality in the United States declined dramatically over the last century; however, this trend has reversed somewhat in the last several decades and racial and ethnic disparities persist.²

In 2007, the latest year for which data are available, the maternal mortality rate was 12.7 deaths per 100,000 live births, compared to a low of 6.6 per 100,000 in 1987. This represents

a total of 548 women who died due to maternal causes in 2007. Some of this increase observed over the past decades may be due to changes in the coding and classification of maternal deaths.

The maternal mortality rate among non-Hispanic Black women was approximately 2.7 times the rate for non-Hispanic White women (28.4 versus 10.5 per 100,000), while the maternal mortality rate among Hispanic women was 8.9 deaths per 100,000 live births.

Causes of maternal death are classified as direct, indirect, or unspecified. Some of the most common direct causes are complications related to the puerperium, or period immediately after delivery (2.2 per 100,000), eclampsia and pre-eclampsia (1.5 per 100,000), hemorrhage of preg-

nancy, childbirth, and placenta previa (0.9 per 100,000), and pregnancy with abortive outcome (0.7 per 100,000). Indirect causes occurred at a rate of 3.1 per 100,000, and comprised deaths from pre-existing conditions complicated by pregnancy. The rate of maternal deaths from unspecified causes was 0.5 per 100,000.

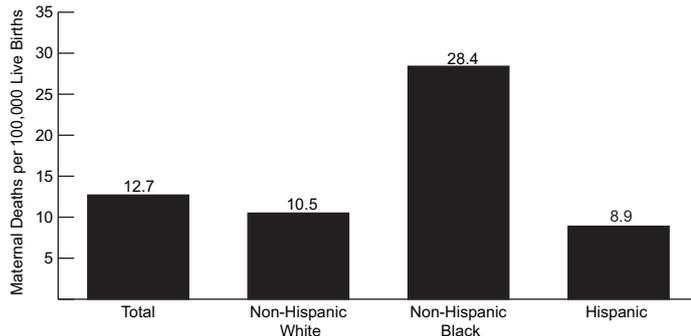
For more information on maternal morbidity, please see *Women's Health USA 2011* available at: <http://www.mchb.hrsa.gov/publications/index.html>.

1 Xu J, Kochanek K, Murphy S, Tejada-Vera B. *Deaths: Final data for 2007. National vital statistics reports; vol 58, no 19. Hyattsville, MD: National Center for Health Statistics. May 2010.*

2 Chang J, Elam-Evans LD, Berg CJ et al. *Pregnancy-Related Mortality Surveillance --- United States, 1991—1999. MMWR. 2003; 52(SS02);1-8.4*

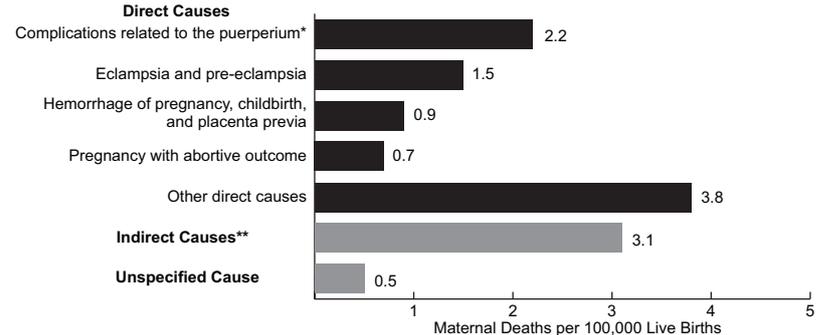
Maternal Mortality Rates, by Race/Ethnicity, 2007

Source (II.5): Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System



Leading Causes of Maternal Mortality, 2007

Source (II.5): Centers for Disease Control and Prevention, National Center for Health Statistics, National Vital Statistics System



*Deaths occurring in the period immediately after delivery. **Deaths from pre-existing conditions complicated by pregnancy.