

# Recent Trends in Infant Mortality in the United States

Marian F. MacDorman, Ph.D., and T.J. Mathews, M.S.

## Key findings

### Data from the Linked Birth/Infant Death Data Set and Preliminary Mortality Data File, National Vital Statistics System

- The U.S. infant mortality rate did not decline from 2000 to 2005.
- Data from the preliminary mortality file suggest a 2% decline in the infant mortality rate from 2005 to 2006.
- The U.S. infant mortality rate is higher than those in most other developed countries, and the gap between the U.S. infant mortality rate and the rates for the countries with the lowest infant mortality appears to be widening.
- The infant mortality rate for non-Hispanic black women was 2.4 times the rate for non-Hispanic white women. Rates were also elevated for Puerto Rican and American Indian or Alaska Native women.
- Increases in preterm birth and preterm-related infant mortality account for much of the lack of decline in the United States' infant mortality rate from 2000 to 2005.

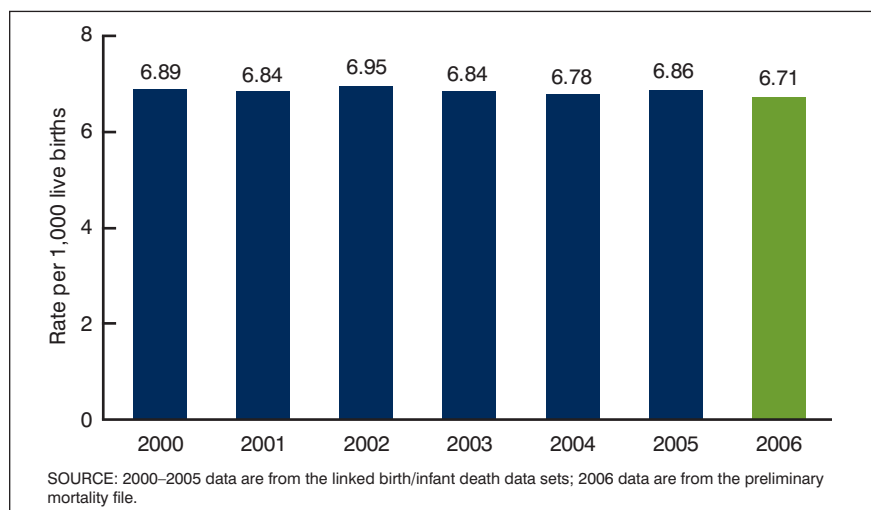
Infant mortality is one of the most important indicators of the health of a nation, as it is associated with a variety of factors such as maternal health, quality and access to medical care, socioeconomic conditions, and public health practices. The U.S. infant mortality rate generally declined throughout the 20th century. In 1900, the U.S. infant mortality rate was approximately 100 infant deaths per 1,000 live births, while in 2000, the rate was 6.89 infant deaths per 1,000 live births. However, the U.S. infant mortality rate did not decline significantly from 2000 to 2005, which has generated concern among researchers and policy makers.

*Keywords: Infant mortality • trends • race and ethnicity • preterm birth • international comparisons*

## What is the recent trend in infant mortality?

In 2005, the U.S. infant mortality rate was 6.86 infant deaths per 1,000 live births, not significantly different than the rate of 6.89 in 2000, based on data from the linked birth/infant death data set (1,2).

Figure 1. Infant mortality rate: United States, 2000–2005, and 2006 preliminary



Data from the preliminary mortality file estimate an infant mortality rate of 6.71 for 2006 (3), a 2% decline from the final rate in 2005.

The 2000–2005 plateau in the U.S. infant mortality rate represents the first period of sustained lack of decline in the U.S. infant mortality rate since the 1950s.

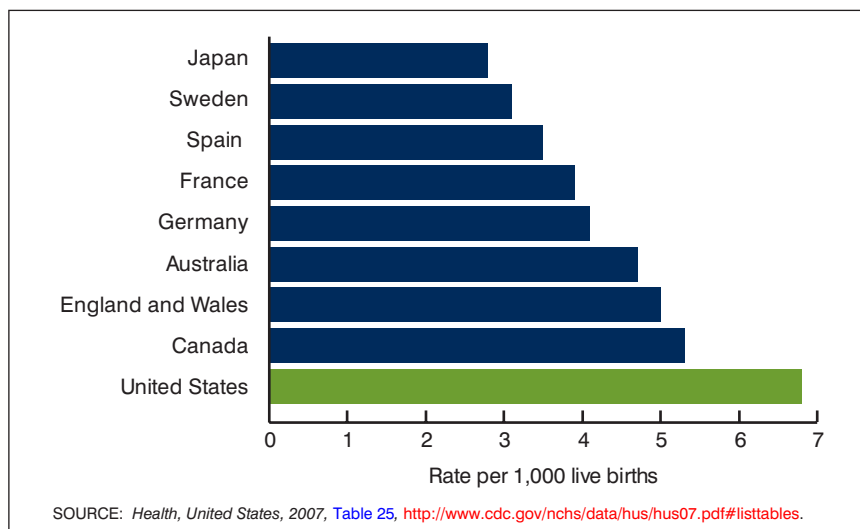
The Healthy People 2010 target goal for the U.S. infant mortality rate is 4.5 infant deaths per 1,000 live births (4). The current U.S. rate is about 50% higher than the goal.

The impact of infant mortality is considerable: There are more than 28,000 deaths to children under 1 year of age each year in the United States.

### How does the United States compare with other developed countries in infant mortality?

In 2004 (the latest year that data are available for all countries), the United States ranked 29th in the world in infant mortality, tied with Poland and Slovakia (5).

Figure 2. Infant mortality rates: Selected countries, 2004



Infant mortality rates were generally lowest (below 3.5 per 1,000) in selected Scandinavian (Sweden, Norway, and Finland) and East Asian (Japan, Hong Kong, and Singapore) countries. In 2004, 22 countries had infant mortality rates below 5.0 (5).

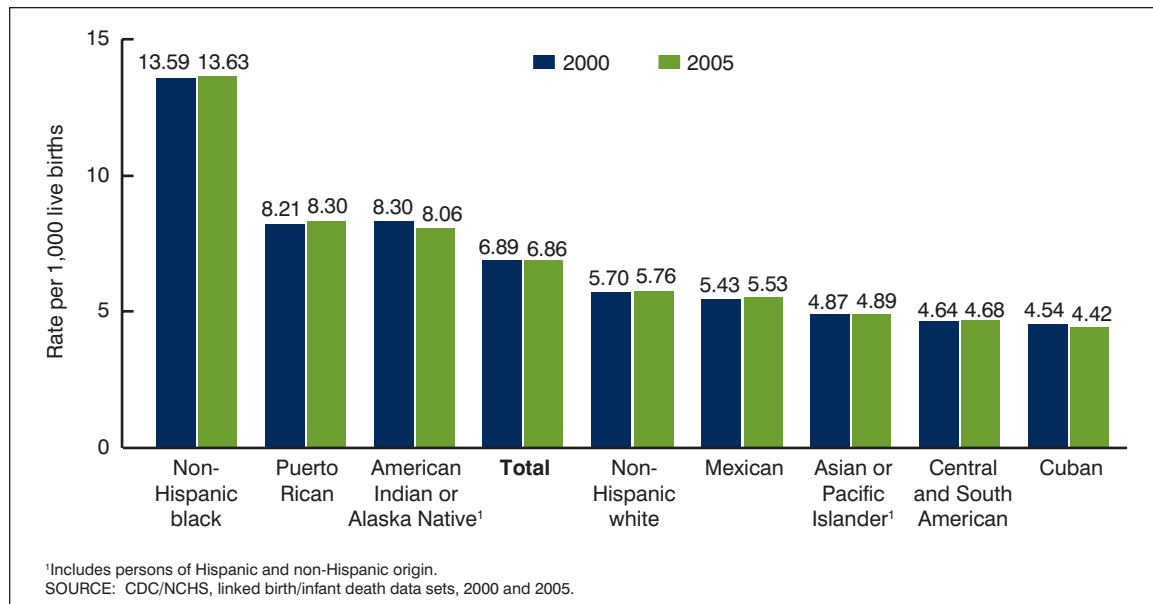
The United States' international ranking fell from 12th in 1960 to 23d in 1990, and to 29th in 2004 (5).

International comparisons of infant mortality can be affected by differences in reporting of fetal and infant deaths. However, it appears unlikely that differences in reporting are the primary explanation for the United States' relatively low international ranking.

## Are there differences in infant mortality rates between racial and ethnic groups?

In 2005, there was a more than threefold difference in infant mortality rates by race and ethnicity, from a high of 13.63 for non-Hispanic black women to a low of 4.42 for Cuban women.

Figure 3. Infant mortality rates by race and ethnicity: United States, 2000 and 2005



Infant mortality rates were above the U.S. average for non-Hispanic black, Puerto Rican (8.30), and American Indian or Alaska Native (8.06) women.

These differences may relate in part to differences in risk factors for infant mortality such as pre-term and low birthweight delivery, socioeconomic status, access to medical care, etc. However, many of the racial and ethnic differences in infant mortality remain unexplained.

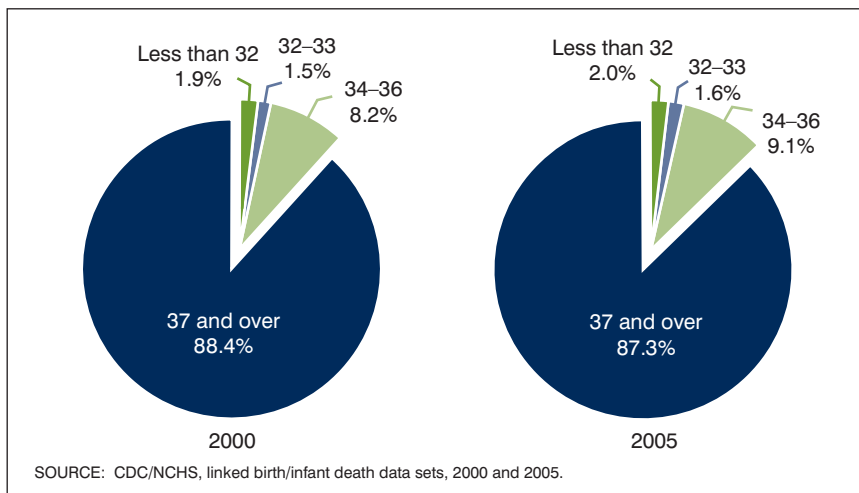
The infant mortality rate did not change significantly for any race/ethnicity group from 2000 to 2005.

The only race/ethnicity group to achieve the Healthy People 2010 target goal (4.5) as of 2005 was the Cuban population (4.42).

## Has the percentage of preterm births (an important risk factor for infant mortality) increased from 2000 to 2005?

Preterm birth (births at less than 37 completed weeks of gestation) is a key risk factor for infant death. The percentage of preterm births has increased rapidly in the United States in recent years. From 2000 to 2005, the percentage of preterm births increased from 11.6% to 12.7%—a 9% increase.

Figure 4. Percentage of live births by weeks of gestation: United States, 2000 and 2005



From 2000 to 2005, increases occurred for each preterm gestational age grouping. For example, the percentage of very preterm births (less than 32 weeks of gestation) increased by 5%—from 1.93% in 2000 to 2.03% in 2005.

From 2000 to 2005, the increase was most rapid for infants born in the late preterm period (34–36 weeks of gestation). The percentage of late preterm births increased by 11%—from 8.2% in 2000 to 9.1% in 2005.

The overall percentage of preterm births has increased in the United States since the mid-1980s. Although a portion of the increase is due to increases in multiple births, the percentage of preterm births also increased among single births (6).

### How has the increase in preterm births affected the U.S. infant mortality rate?

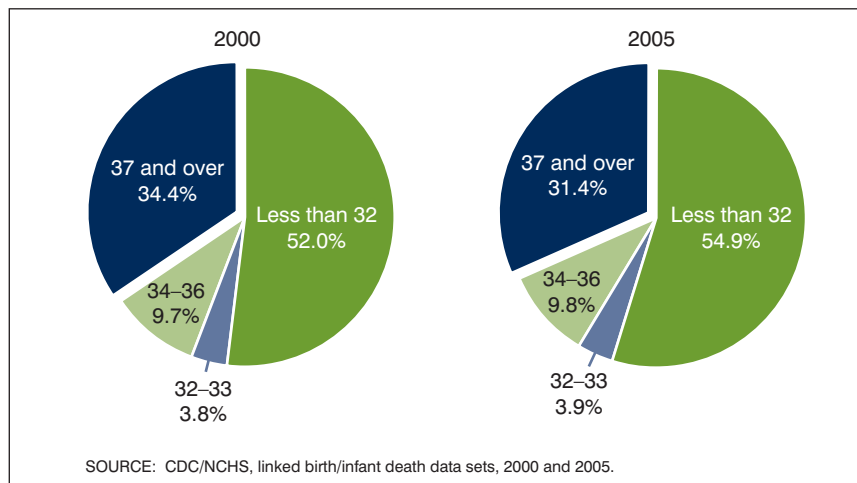
In 2005, 68.6% of all infant deaths occurred to preterm infants, up from 65.6% in 2000.

Very preterm infants accounted for only 2% of births, but over one-half of all infant deaths in both 2000 and 2005. Because the majority of infant deaths occur to very preterm infants, changes in either the percentage of these infants or in their infant mortality rate can have a large impact on the overall infant mortality rate.

The infant mortality rate for very preterm infants was 183.24 infant deaths per 1,000 live births in 2005, not significantly different from the rate in 2000 (180.94), halting a long-term decline (1,2).

The plateau in the U.S. infant mortality rate from 2000 to 2005 was largely due to the combination of the increase in the percentage of very preterm births and the lack of decline in the infant mortality rate for these births. However, the increase in the percentage of late preterm births has also had an impact. In 2005, the infant mortality rate for late preterm births was three times that for term births (37–41 weeks) (1).

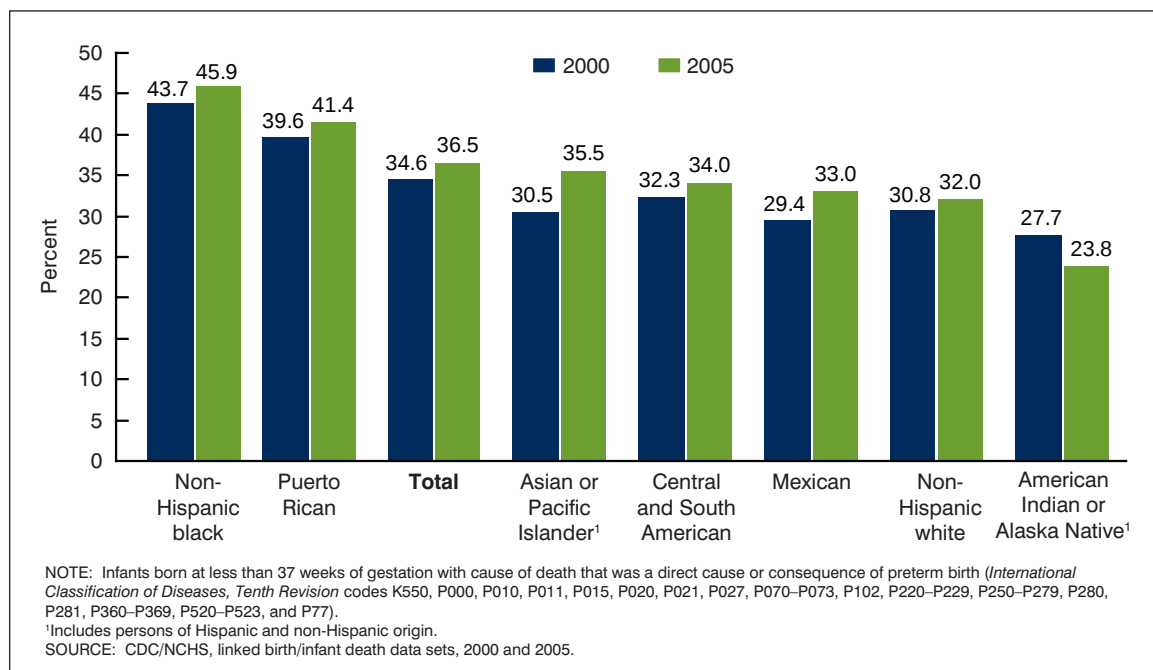
Figure 5. Percentage of infant deaths by weeks of gestation: United States, 2000 and 2005



### What is the impact of *preterm-related* causes of death?

In 2005, 36.5% of infant deaths in the United States were due to preterm-related causes of death, a 5% increase since 2000 (34.6%). Preterm-related causes were those where the cause of death was a direct consequence of preterm birth, and 75% or more of total infant deaths attributed to that cause were preterm (7).

Figure 6. Percentage of infant deaths from preterm-related causes, by race and ethnicity: United States, 2000 and 2005



From 2000 to 2005, the percentage of infant deaths from preterm-related causes increased significantly for non-Hispanic white, non-Hispanic black, Asian or Pacific Islander, and Mexican mothers.

The impact of preterm-related infant mortality was high for all racial and ethnic groups. However, some groups were disproportionately affected. For example, nearly half (46%) of infant deaths to non-Hispanic black women, and 41% of infant deaths to Puerto Rican women were preterm-related, compared with 32% for non-Hispanic white women.

## Summary

Despite the dramatic decline in infant mortality during the 20th century, the U.S. infant mortality rate appears to have plateaued in the first few years of the 21st century.

The U.S. infant mortality rate is higher than rates in most other developed countries. The relative position of the United States in comparison to countries with the lowest infant mortality rates, appears to be worsening. In 2004, the United States ranked 29th in the world in infant mortality, tied with Poland and Slovakia. Previously, the United States' international ranking in infant mortality was 12th in 1960 and 23d in 1990.

There are large differences in infant mortality rates by race and ethnicity. Non-Hispanic black, American Indian or Alaska Native, and Puerto Rican women have the highest infant mortality rates; rates are lowest for Asian or Pacific Islander, Central and South American, and Cuban women.

Preterm birth has a considerable impact on the U.S. infant mortality rate. The plateau in the U.S. infant mortality rate from 2000 to 2005 is due to an increase in the percentage of infants born preterm (including very preterm and late preterm), together with a lack of decline in the infant mortality rate for very preterm infants. There has also been an increase in the relative impact of preterm-related causes of death. In 2005, 36.5% of infant deaths in the United States were due to preterm-related causes of death, a 5% increase since 2000. The impact of preterm-related causes of death was even higher for non-Hispanic black and Puerto Rican women.

## Definitions

Infant death: Death of an infant before his or her first birthday.

Infant mortality rate: Number of infant deaths per 1,000 live births.

Preterm birth: Birth before 37 completed weeks of gestation.

Very preterm birth: Birth before 32 completed weeks of gestation.

Late preterm birth: Birth from 34 to 36 completed weeks of gestation.

Term birth: Birth from 37 to 41 completed weeks of gestation.

Preterm-related causes of death: Causes of death were considered preterm-related when the cause was considered to be a direct consequence of preterm birth based on a clinical evaluation and review of the literature, and when 75% or more of total infant deaths attributed to that cause were to preterm infants.

## Data source and methods

This report contains data from the linked birth/infant death data set and the preliminary mortality file, both of which are part of the National Vital Statistics System. The linked birth/infant death data set is the premier data source for analyzing infant mortality trends and patterns in the United States. In the linked birth/infant death data set, information from the birth certificate is linked to information from the death certificate for each infant less than 1 year of age who dies in the United States. The purpose of the linkage is to use the many additional variables available from the birth certificate to conduct more detailed analyses of infant mortality patterns. The linked birth/infant death data set is particularly useful for computing accurate infant mortality rates by race and ethnicity because the race and ethnicity of the mother from the birth certificate is used in both the numerator and denominator of the infant mortality rate. The race and ethnicity from the birth certificate is generally provided by the mother at the time of delivery, and is considered to be more accurate than race and ethnicity from the death certificate that is provided by an informant, or in the absence of an informant, by observation. Linked birth/infant death data sets are available from NCHS: <http://www.cdc.gov/nchs/about/major/dvs/Vitalstatsonline.htm>.

The report also uses data from the 2006 preliminary mortality file, which is available sooner than the linked birth/infant death data, but does not contain information on birth characteristics.

## About the authors

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