

# **Infant Mortality: Trends and Disparities**

**Marian MacDorman and T.J. Mathews  
Division of Vital Statistics  
National Center for Health Statistics**

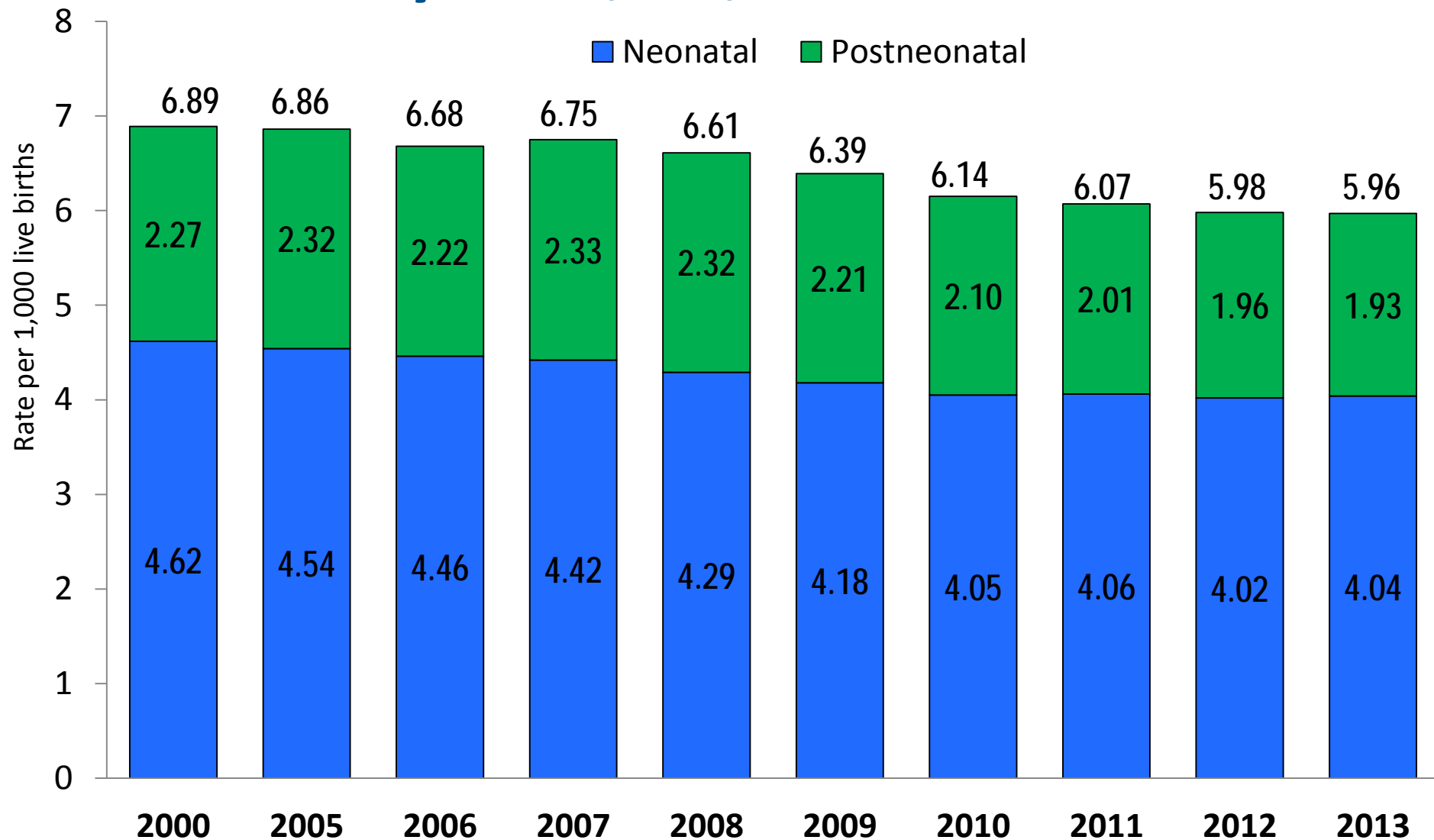
**Presented to the Secretary's Advisory  
Committee on Infant Mortality**

**March 26, 2015**

# Vital Statistics Infant Mortality Data

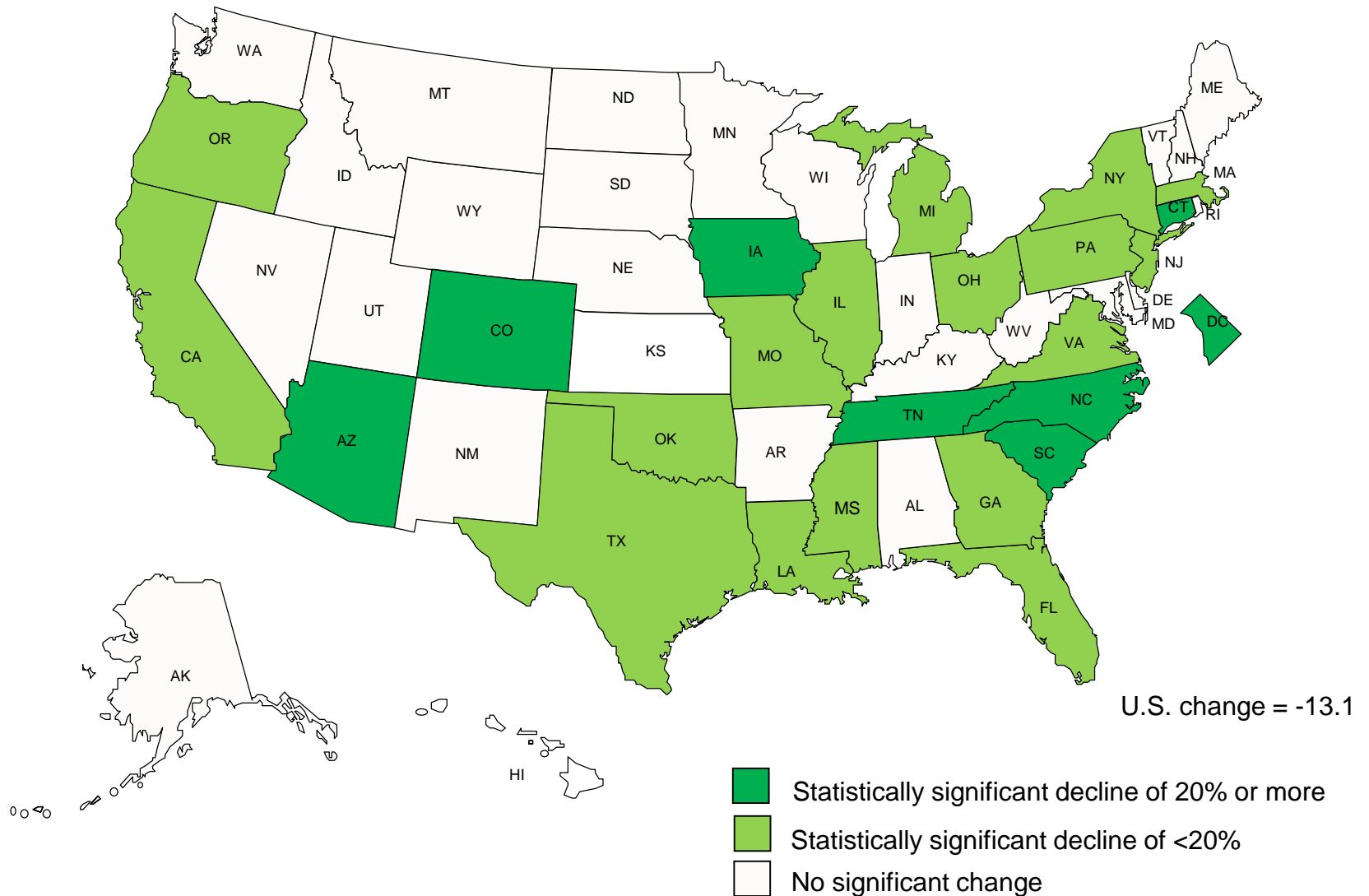
- Based on all birth and death certificates filed in state vital statistics offices, and transmitted to NCHS.
- National data files currently available:
  - Birth (natality) data – 2013 final
  - Mortality data – 2013 final
  - Fetal death data – 2012 final
  - Linked birth/infant death data set (linked file) – 2012 period file
    - Links birth and death certificate data for all infant deaths.
    - Purpose: To use more detailed data from the birth certificate for infant mortality analysis. Linked file provides more accurate data by race and ethnicity than mortality data.
- For this presentation, black and white = non-Hispanic black and non-Hispanic white

# Infant, neonatal and postneonatal mortality rates, US, 2000 and 2005-2013



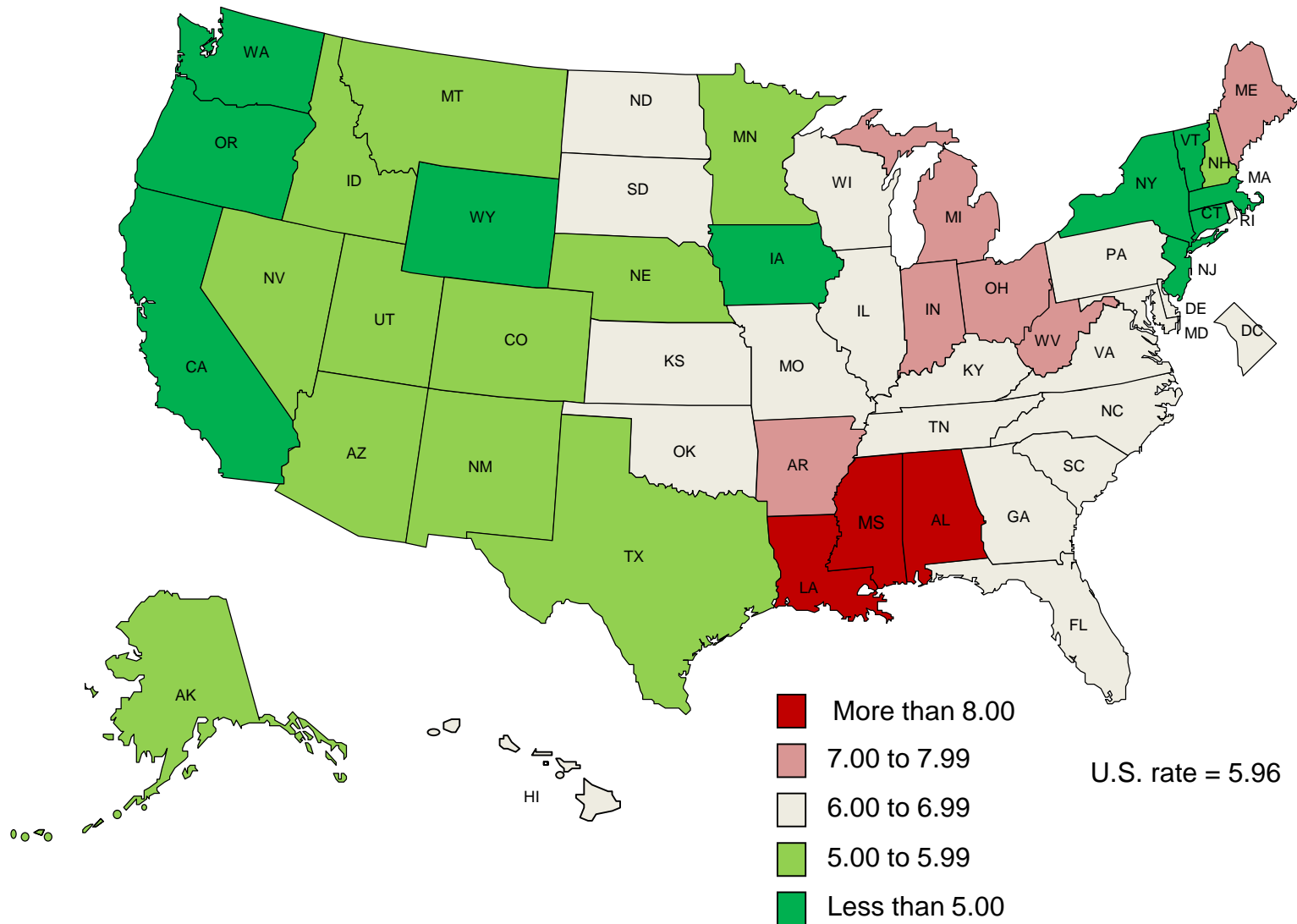
Source: 2000-2012 data are from the linked birth/infant death data set. 2013 data are from the main mortality file.

# Decline in infant mortality rates by state, 2005-2013



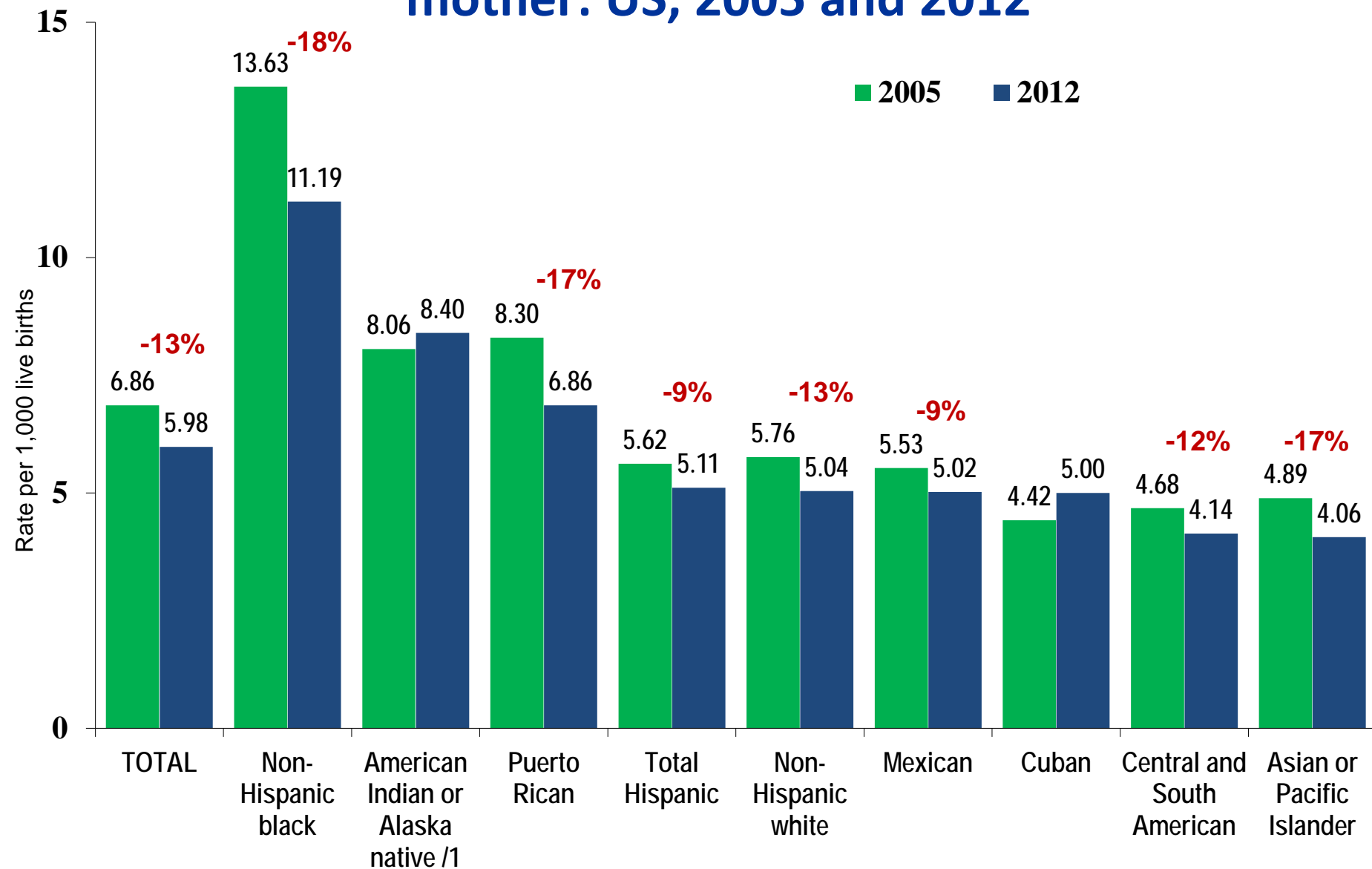
Source: CDC/NCHS, National Vital Statistics System, main mortality file.

# Infant mortality rates by State, 2013



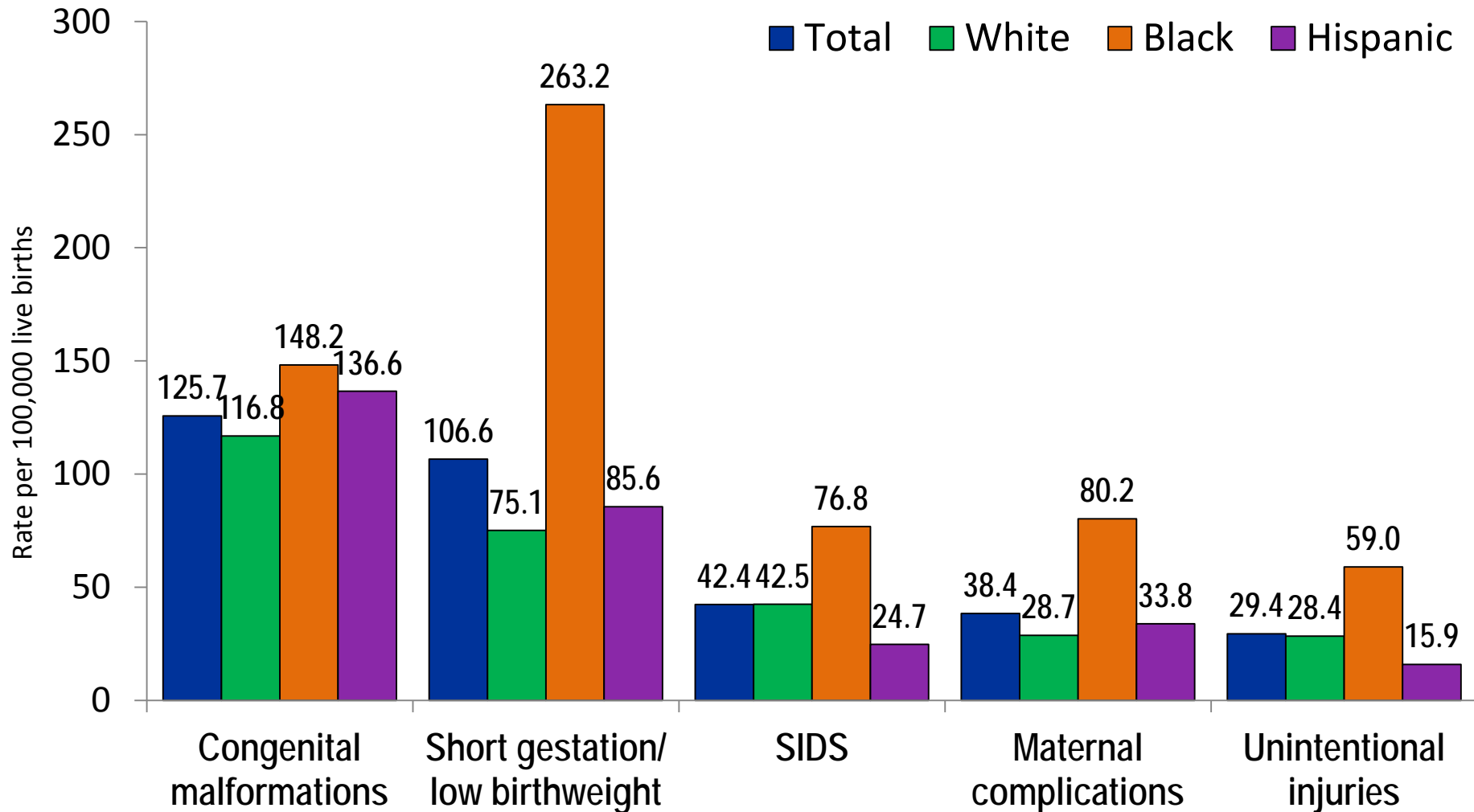
Source: CDC/NCHS, National Vital Statistics System, main mortality file.

# Infant mortality rates by race and Hispanic origin of mother: US, 2005 and 2012



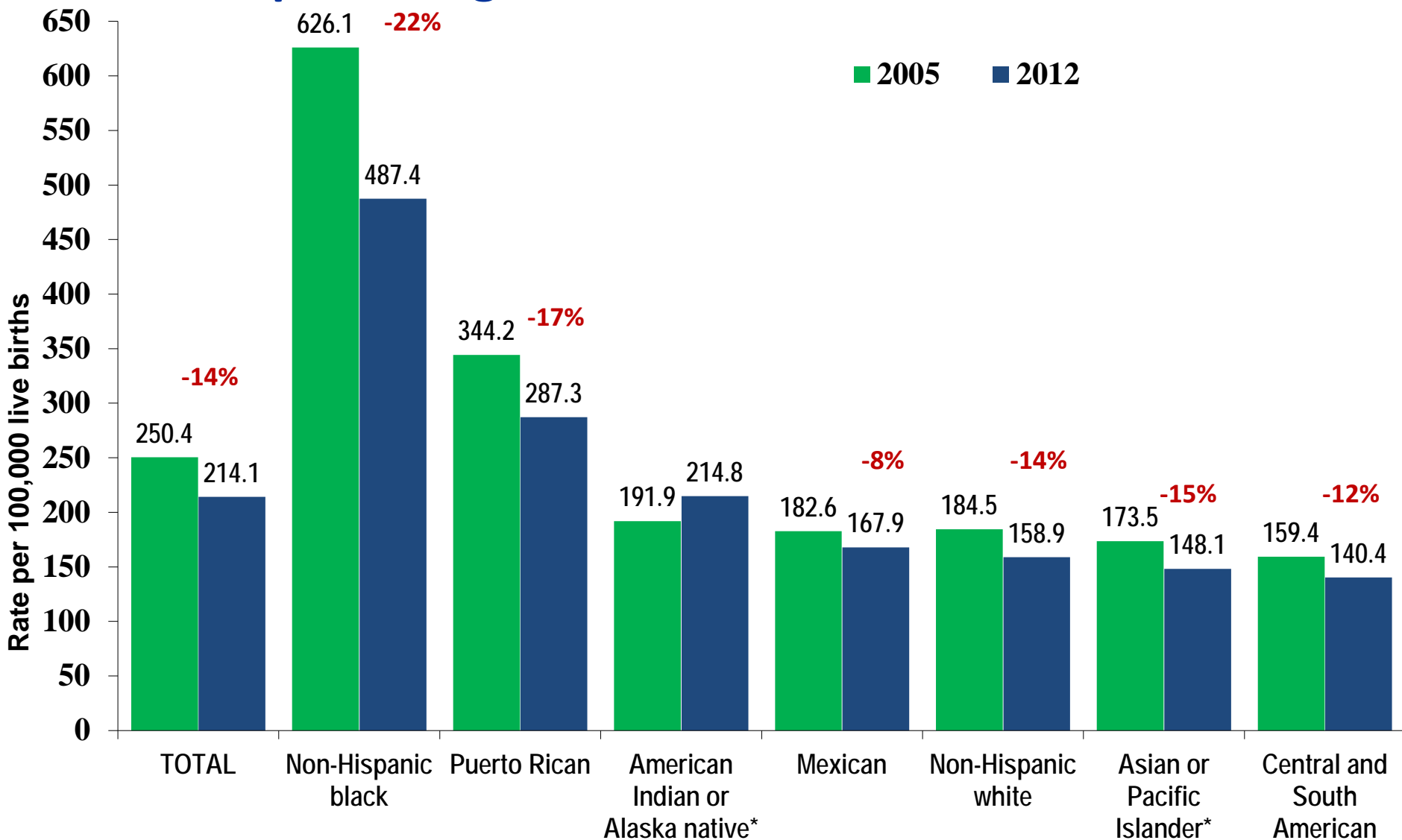
1/ Includes persons of Hispanic and non-Hispanic origin. Note: Percent change indicates statistically significant change between 2005 and 2012. SOURCE: National Vital Statistics System, NCHS, CDC.

# Infant mortality rates for the five leading causes of infant death by maternal race and Hispanic origin, US, 2012



Source: CDC/NCHS linked birth/infant death data set.

# Preterm-related infant mortality rates by race and Hispanic origin of mother: US, 2005 and 2012



\*Includes persons of Hispanic and non-Hispanic origin. Rates per 100,000 live births. Source: CDC/NCHS linked birth/infant death data set.



# **New variables available from states that have revised their birth certificates**

- **educational attainment of father**
- **birth interval**
- **receipt of WIC food**
- **exact time of birth**
- **source of payment for the delivery**
- **mother's body mass index (BMI) (including height and weight)**
- **cigarette smoking before and during pregnancy**
- **infertility treatment**
- **maternal infections**
- **maternal morbidity**
- **10-minute Apgar score**
- **infant breastfed**

**Available in birth file from 2009 data onwards, and in linked file from 2011 data onwards.**

# New Data of Variable Quality

- 1 study out, 1 underway

## National Vital Statistics Reports

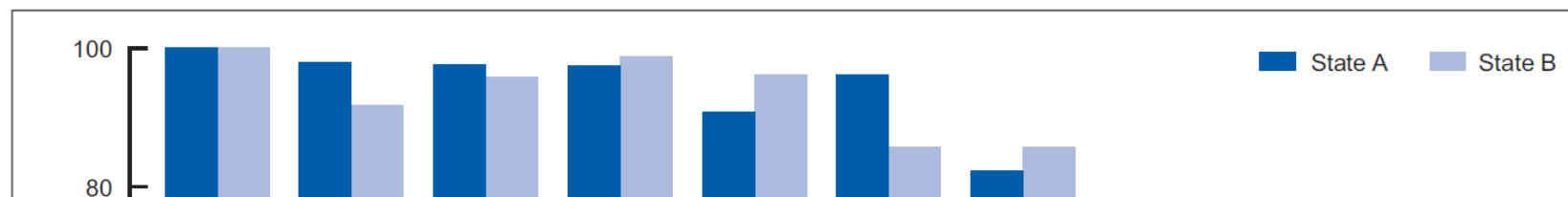


Volume 62, Number 2

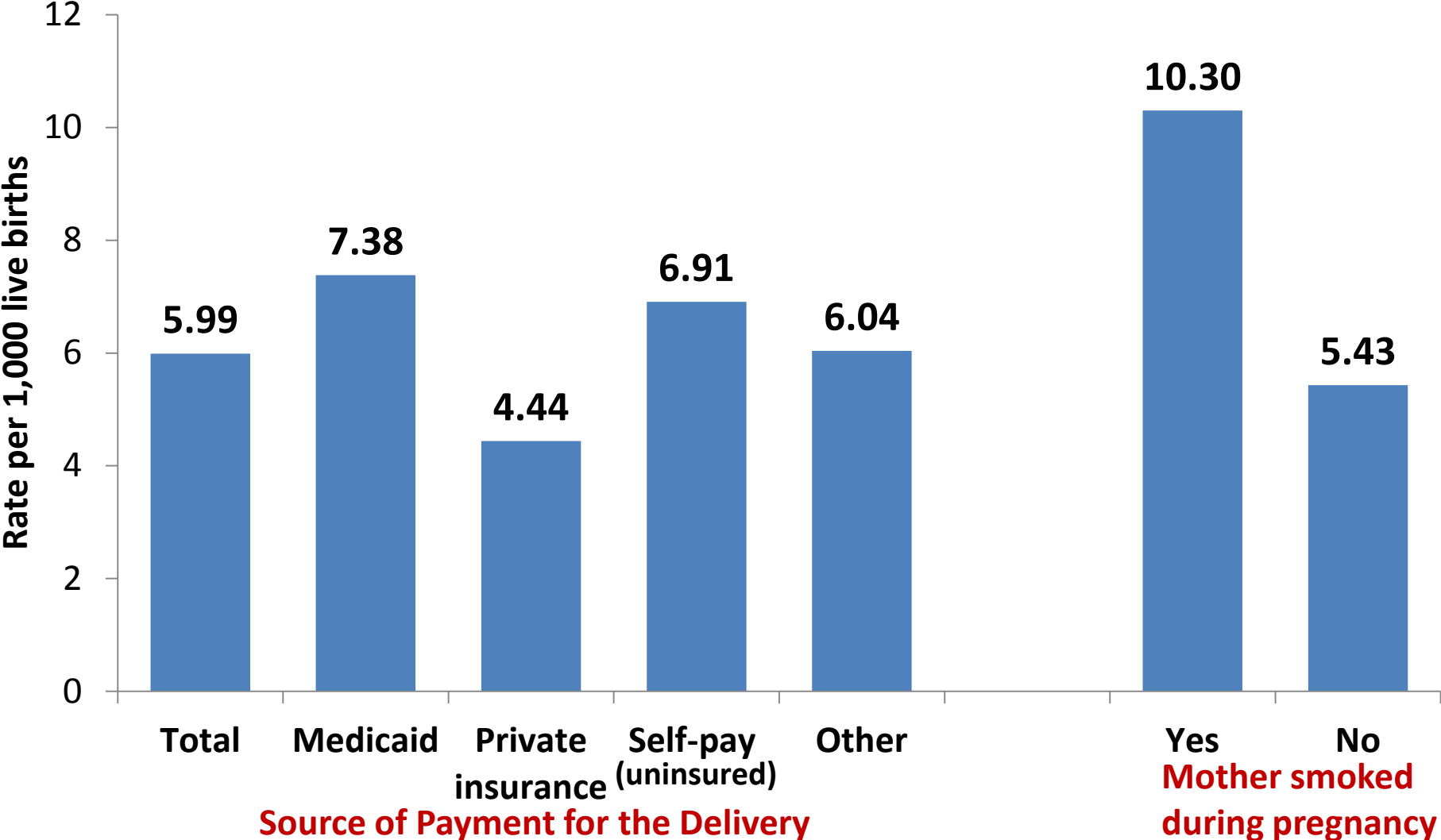
July 22, 2013

### Assessing the Quality of Medical and Health Data From the 2003 Birth Certificate Revision: Results From Two States

by Joyce A. Martin, M.P.H.; Elizabeth C. Wilson, M.P.H.; Michelle J.K. Osterman, M.H.S.; Elizabeth W. Saadi, Ph.D.; Shae R. Sutton, Ph.D.; and Brady E. Hamilton, Ph.D.

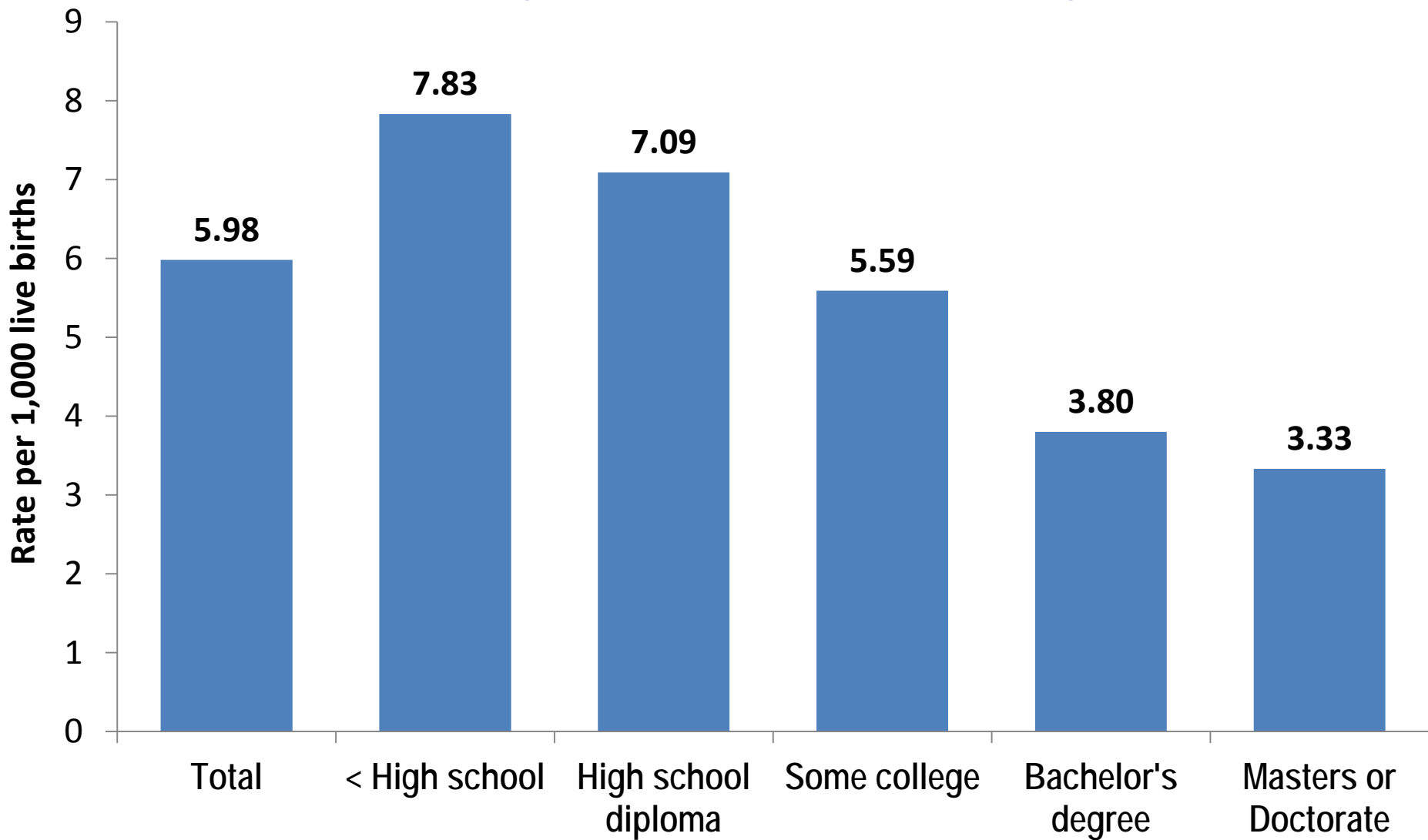


# Infant mortality rates by source of payment for the delivery and smoking status, 36 states and DC, 2012



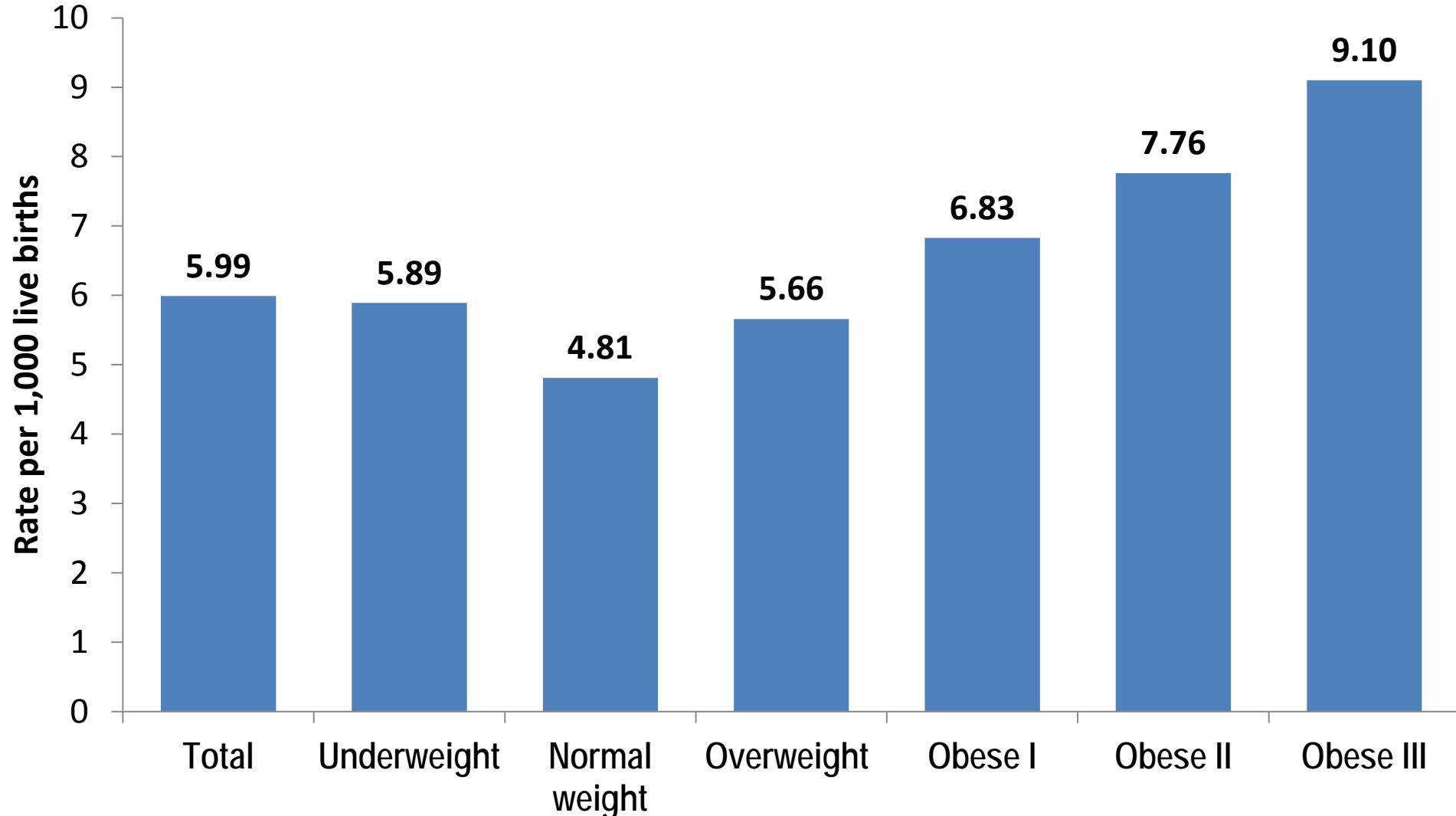
Note: Smoking reported for 35 states and DC. Source: CDC/NCHS: 2012 linked birth/infant death data set.

# Infant mortality rates by maternal educational attainment, 36 states and DC, 2012



Source: CDC/NCHS: 2012 linked birth, infant death data set.

# Infant mortality rates by pre-pregnancy Body Mass Index (BMI), 36 states and DC, 2012

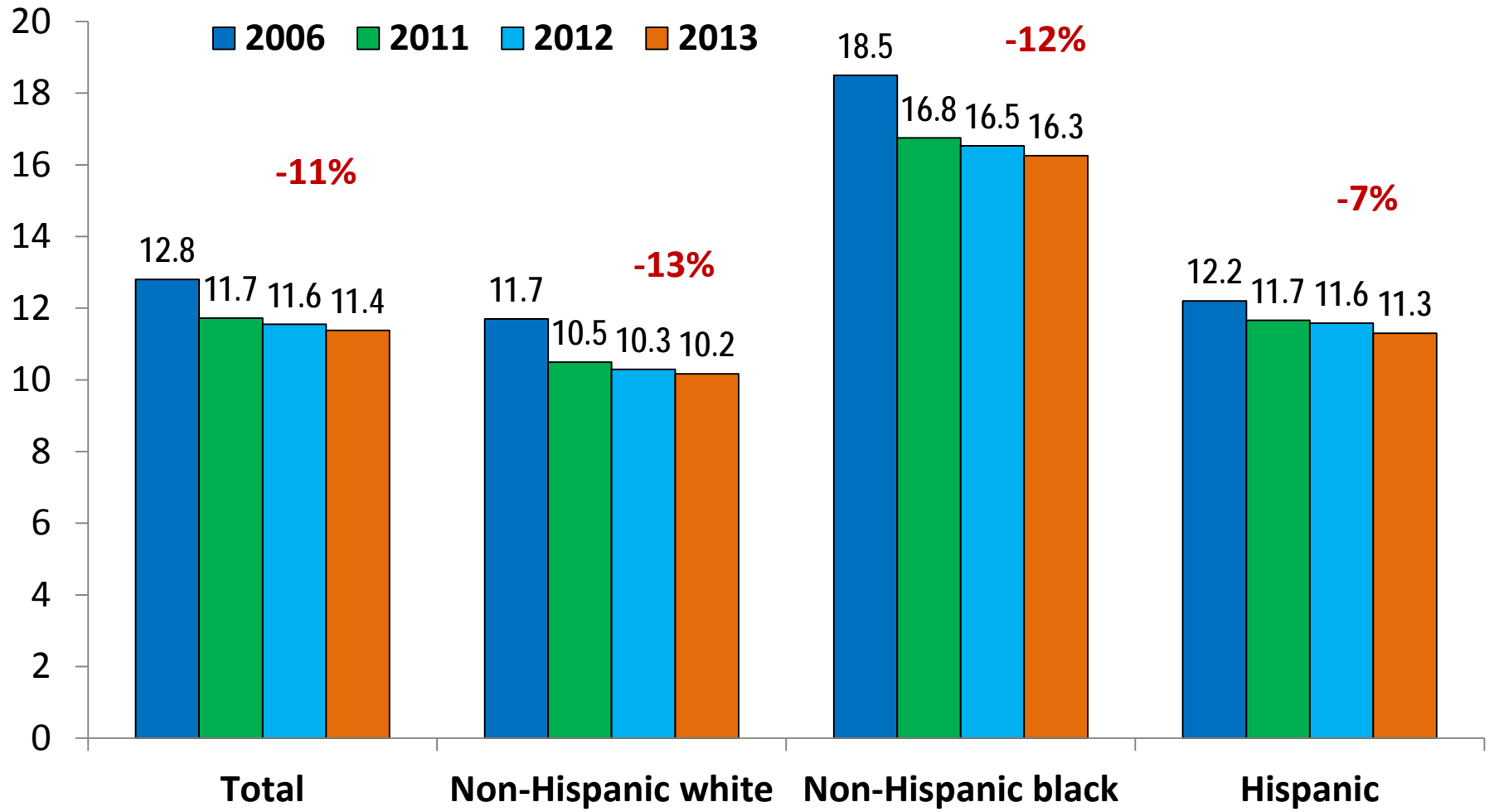


Underweight = BMI < 18.5, normal weight = BMI 18.5-24.9, overweight = BMI 25.0-29.9, obese I = BMI 30.0-34.9, obese II = BMI 35.0-39.9, obese III = BMI 40+. Source: CDC/NCHS: 2012 linked birth/infant death data set.

# Components of infant mortality

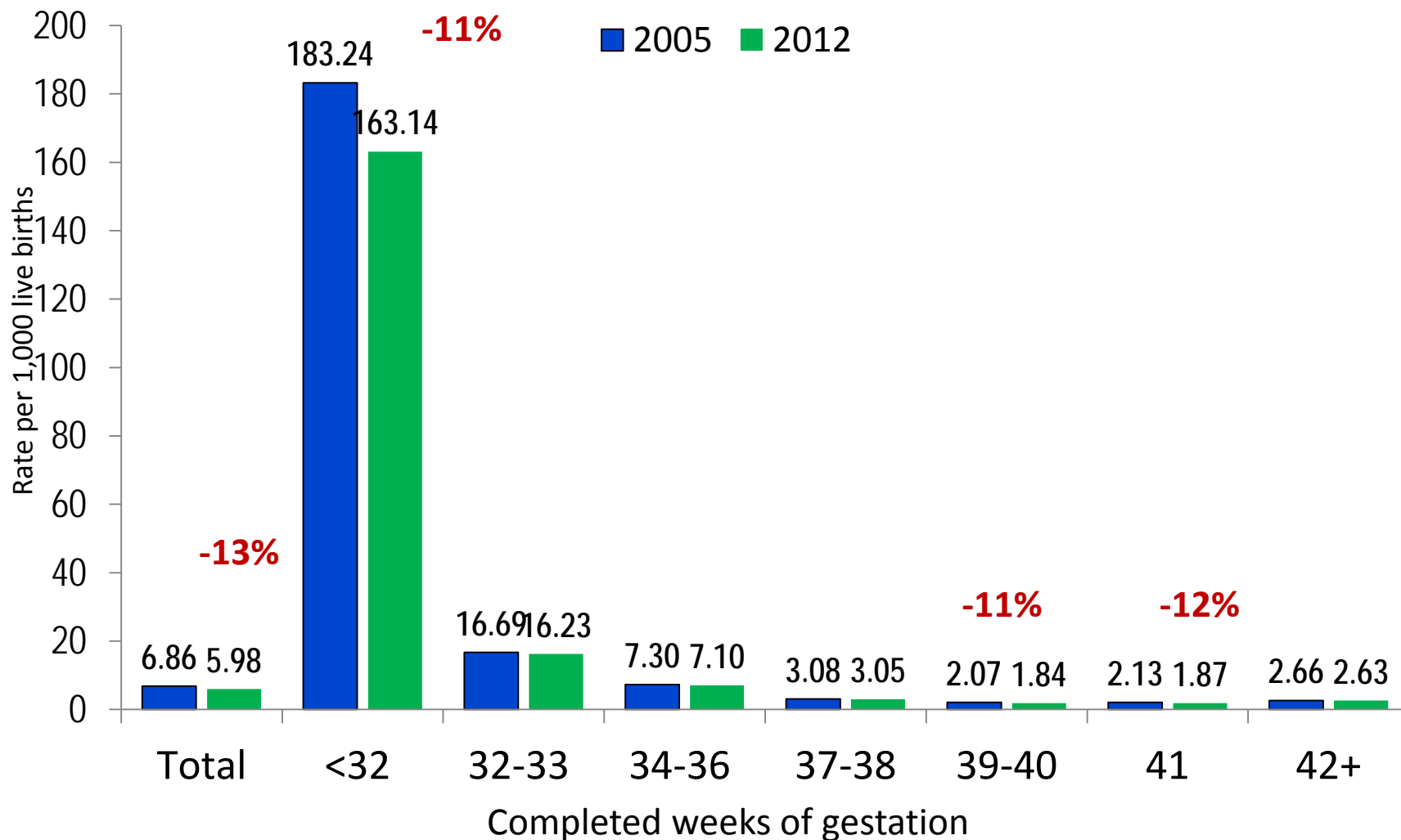
- The overall infant mortality rate can be partitioned into two key components:
  - 1) The distribution of births by gestational age;
  - 2) Gestational age-specific infant mortality rates (i.e. the mortality rate for infants at a given gestational age).

# Percentage of preterm births by maternal race/ethnicity, 2006, 2011, 2012 and 2013



Sources: Martin et al. Births: Final Data for 2013.

# Infant mortality rates by gestational age, US, 2005 and 2012



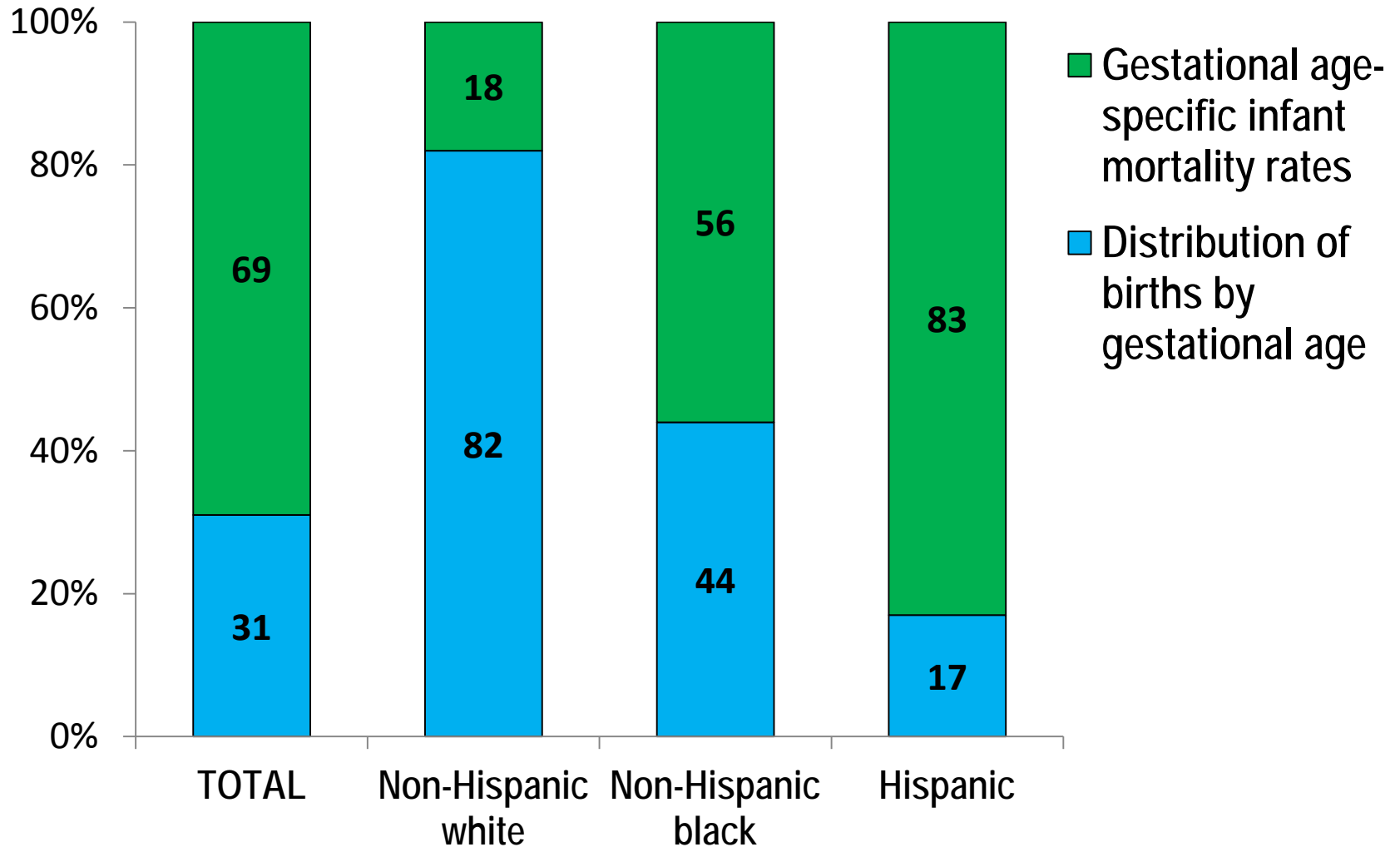
Source: CDC/NCHS, linked birth/infant death data set.



# Kitagawa analysis

- Used to quantify the relative contribution of changes in the two components, to the 2005-2012 infant mortality decline.
- Analyzed separately for the total population and for non-Hispanic white, non-Hispanic black, and Hispanic women.

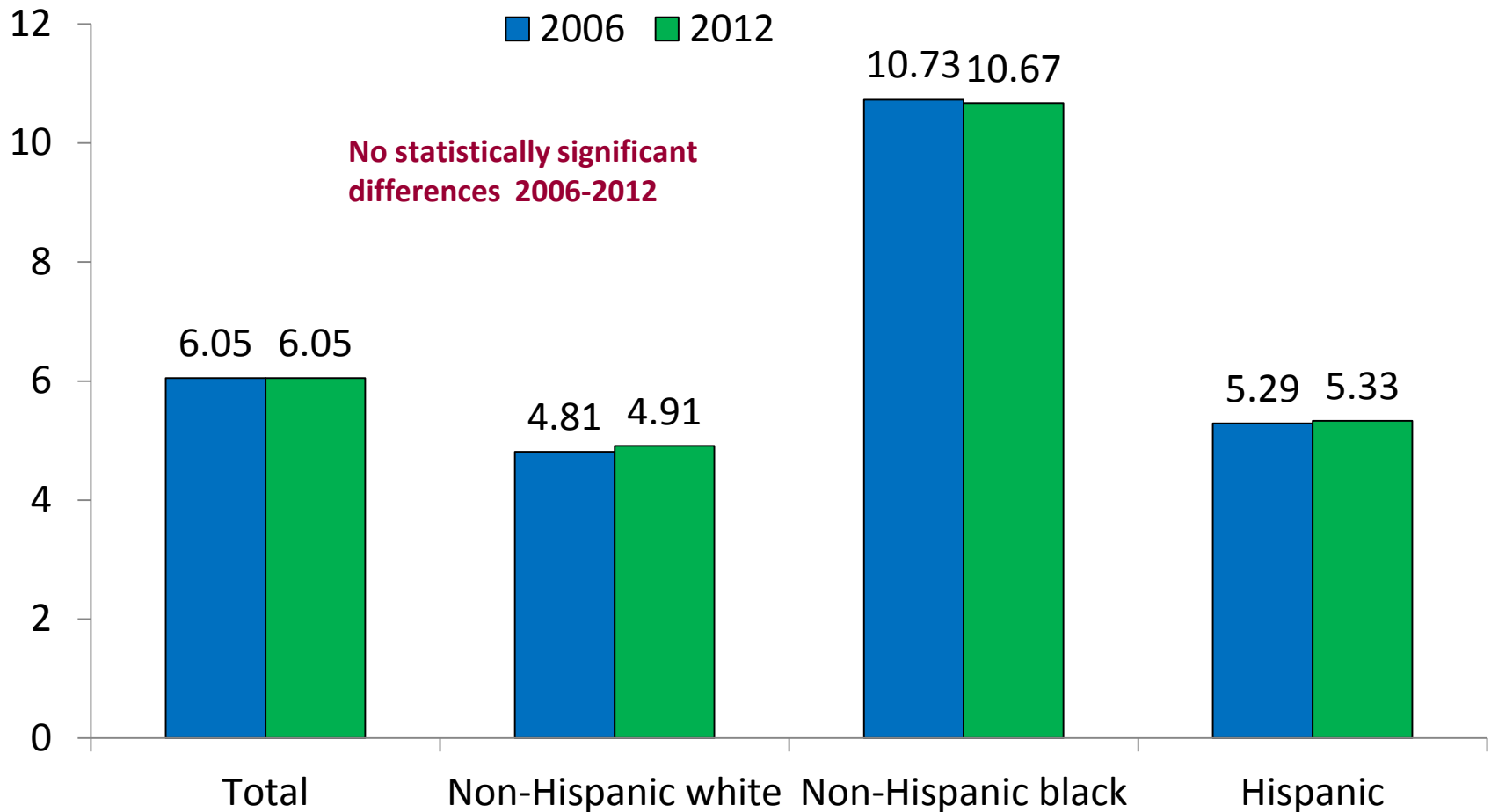
# Percent contribution of two components to decline in US infant mortality rate 2005-2012, by race/ethnicity



Source: CDC/NCHS, linked birth/infant death data set.

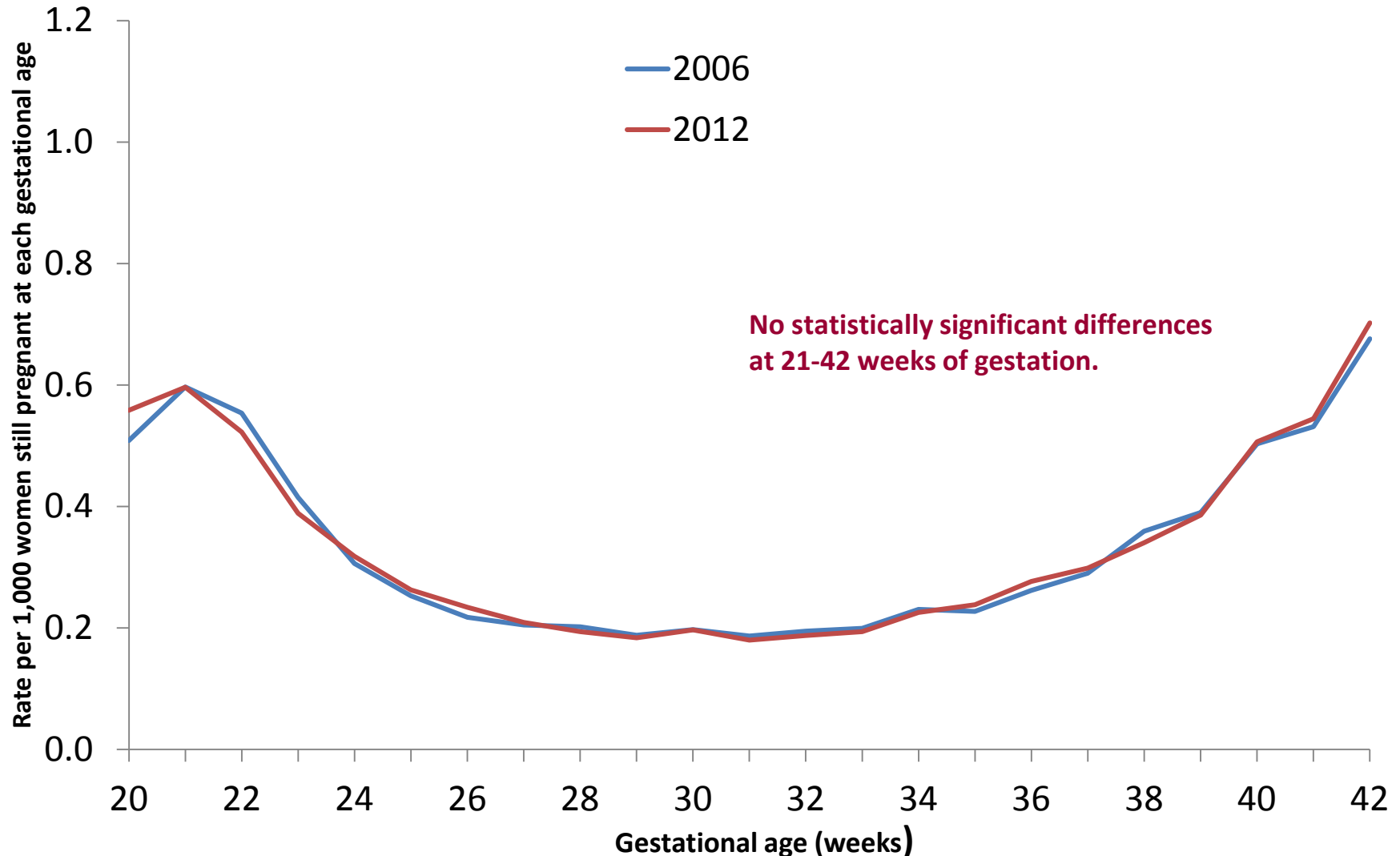
# Fetal mortality

# Fetal mortality rates by race and Hispanic origin of mother, US, 2006-2012



Source: National vital statistics system, fetal death data set.

# Prospective fetal mortality rate by gestational age: US, 2006 and 2012



Note: The prospective fetal mortality rate is the number of fetal deaths at a given gestational age per 1,000 live births and fetal deaths at that gestational age or greater. Source: CDC/NCHS, fetal death file.

# Conclusions

- After a plateau from 2000-2005, the US infant mortality rate declined by 13%, to 5.98 infant deaths per 1,000 live births in 2012, and 5.96 in 2013.
- Infant mortality rates were much higher for women who were:
  - Uninsured or on Medicaid
  - Smokers
  - High school education or less
  - Overweight or obese.
- After more than two decades of increase, the percent of preterm births declined by 13% from 2006-2013. Still, preterm birth rates were 60% higher for black than for white women.
- Fetal mortality rates plateaued from 2006-2012.

# Conclusions (cont.)

- From 2005-2012, the black infant mortality rate fell by 18% from 13.63 to 11.19; however the 2012 black infant mortality rate was still 2.2 times the white rate (5.04).
- Preterm-related infant mortality rates were 3 times higher for black than for white women. Rates for SIDS and unintentional injuries were also higher for black than for white women.
- About 2/3 (69%) of the overall infant mortality decline from 2005-2012 was due to declines gestational age-specific infant mortality rates, and less than 1/3 (31%) was due to declines in preterm births.
  - However, patterns were very different for white women, with 82% of their infant mortality decline due to decreases in preterm births.

# Contact information

Marian MacDorman

301-458-4356

[mfm1@cdc.gov](mailto:mfm1@cdc.gov)

T.J. Mathews

301-458-4363

[tjm4@cdc.gov](mailto:tjm4@cdc.gov)