



National Center for Health Statistics

Trends in Preterm-Related Infant Mortality by Race and Ethnicity: United States, 1999-2004

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Abstract

Objectives – This report examines trends in preterm-related causes of infant death in the United States by maternal race and ethnicity.

Methods – A grouping of preterm-related causes of infant death was created by identifying causes of death that were a direct cause or consequence of preterm birth. Cause-of-death categories were considered to be preterm-related when 75% or more of total infant deaths attributed to that cause were born preterm, and the cause was considered to be a direct consequence of preterm birth based on a clinical evaluation and review of the literature. Trends in preterm-related causes of death were examined by maternal race and ethnicity.

Results – In 2004, 36.5% of all infant deaths in the United States were preterm-related, up from 35.4% in 1999. The preterm-related infant mortality rate for non-Hispanic black mothers was 3.5 times higher and the rate for Puerto Rican mothers was 75% higher than for non-Hispanic white mothers. The preterm-related infant mortality rate for non-Hispanic black mothers was higher than the total infant mortality rate for non-Hispanic white, Mexican, and Asian or Pacific Islander (API) mothers.

Discussion – The leveling off of the U.S. infant mortality decline since 2000 has been attributed in part to an increase in preterm and low birthweight (LBW) births. Continued tracking of this group of preterm-related causes of infant death will improve our understanding of trends in infant mortality and perinatal health in the United States.

Introduction


The percentage of infants delivered preterm (less than 37 completed weeks of gestation) has been increasing since the mid-1980s, so that by 2004, one out of every eight infants in the United States was born preterm (12.5%) (1). Infants born preterm have much higher mortality rates compared with term births (37–41 weeks of gestation) (2). Rates are highest for infants born at the youngest gestational ages, but are also substantially elevated for late preterm births (34–36 weeks of gestation) (2–4).

The preterm birth of an infant can directly manifest in the cause of death, can make an infant vulnerable to a specific cause of death, or can be incidental to the cause of death. For example, if a preterm infant died of a motor vehicle accident, this death would be considered incidental to preterm birth, as the death probably would have occurred whether or not the infant was born preterm. The purpose of this analysis is to identify causes of death that have a direct, etiological connection to preterm birth.


It is difficult, using traditional analyses of the leading causes of infant death, to assess the overall impact of preterm-related causes of death on infant mortality (5,6). In particular, the most obviously relevant leading cause of death is “Disorders related to short gestation and low birthweight, not elsewhere classified.” As indicated by the phrase “not elsewhere classified” in the category title, some preterm-related causes of death are classified to other cause-of-death categories. This paper extends a previous study (7) to develop a comprehensive grouping of preterm-related causes of death, and also presents trends in preterm-related causes of infant death by race and Hispanic origin of mother.


Methods


The linked birth/infant death data set (linked file) published by the National Center for Health Statistics contains information from matching birth and death certificates for all infants born in the United States who died during their first year of life (2). This data set allows us to combine analysis of birth certificate items (such as gestational age, race, and ethnicity of mother) with an analysis of death certificate items (such as the underlying cause of death). More detailed data from the 2004 linked file, including information on the computation and specification of individual variables, is available elsewhere (2). Causes of death were classified by the International Classification of Diseases, Tenth Revision (8) from 1999–present in the United States. A previous paper identified preterm-related causes from among the 20 leading causes of infant death in the United States in 2002 (7). For the purposes of this report, the previous analysis was extended by examining all of the remaining categories of infant death (outside of the 20 leading causes) to develop a comprehensive grouping of preterm-related causes of death. For an underlying cause of death to be considered preterm-related, 75% or more of infants whose deaths were attributed to that cause had to be born at less than 37 weeks of gestation, and the cause of death had to be a direct consequence of preterm birth based on a clinical evaluation and review of the literature (7).

The comprehensive list of preterm-related cause-of-death categories is shown in the note to the [table](#)  [PDF – 13 KB]. The 1999–2004 linked files were used to compute the number and percentage of infant deaths, and infant mortality rates for this group of preterm-related causes of death by race and Hispanic origin of mother.

Results

The [table](#)  [PDF – 13 KB] shows trends in preterm-related infant mortality by race and Hispanic origin of mother from 1999 to 2004. In 2004, 36.5% of all infant deaths in the United States were from preterm-related causes of death. Preterm-related causes of infant death accounted for 10,180 of the total of 27,860 infant deaths that year. In 1999, 35.4% of all infant deaths in the United States were preterm-related.

The impact of preterm-related causes of infant death varied considerably by maternal race and ethnicity. In 2004, nearly one-half (46%) of infant deaths to non-Hispanic black women and 41% of infant deaths to Puerto Rican women were due to preterm-related causes of death, whereas the percentage was somewhat lower for other race and ethnic groups (see [table](#)  [PDF – 13 KB]).

Preterm-related infant mortality rates varied considerably by maternal race and ethnicity (see [figure](#) and [table](#)  [PDF – 13 KB]). In 2004, preterm-related infant mortality rates were 3.5 times higher for non-Hispanic black (6.29) than for non-Hispanic white (1.82) mothers. It is worth noting that, in 2004, the preterm-related infant mortality rate for non-Hispanic black mothers was higher than the total infant mortality rate for non-Hispanic white, Mexican, and API women. The preterm-related infant mortality rate for Puerto Rican (3.19) mothers was 75% higher than for non-Hispanic white mothers. Preterm-related infant mortality rates for American Indian or Alaska Native (1.89), Mexican (1.76), and API (1.65) women were not significantly different from the rates for non-Hispanic white women.

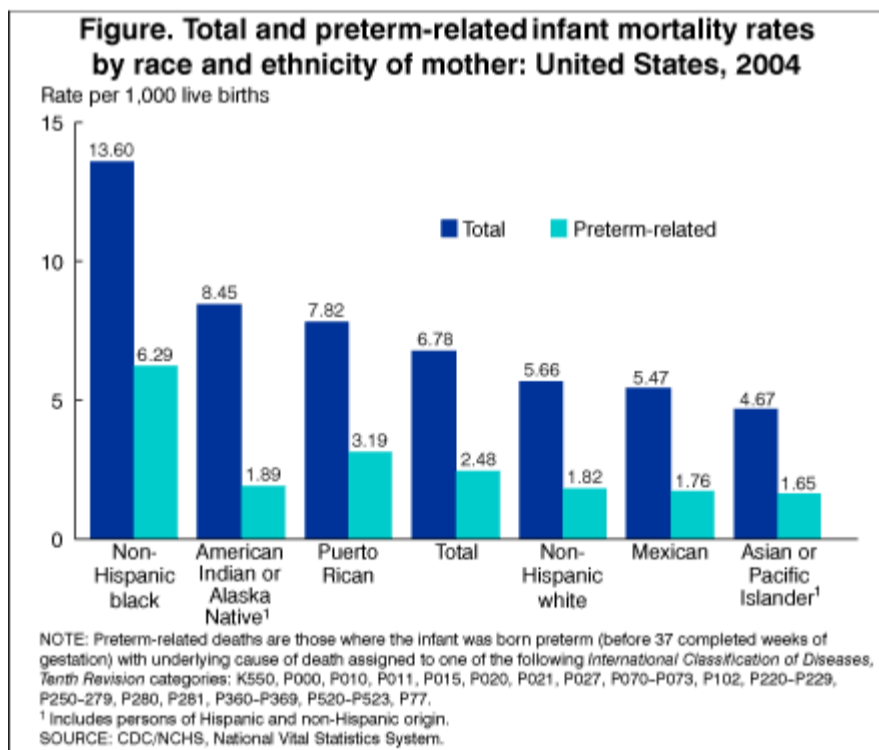
Discussion

In contrast to the historic declines in infant mortality during the 20th century, we have seen a leveling off of the decline in the first few years of the 21st century. The lack of decline in infant mortality since 2000 has been attributed in part to an increase in the number of preterm and LBW births, and in particular to those at the lowest birthweights and youngest gestational ages (9). This is related in part to an increase in multiple births (in part due to increases in the use of assisted reproductive therapies), as well as to changes in the medical management of pregnancy (i.e., increases in cesarean deliveries and induction of labor for preterm infants) (1–4,9,10). Even in the brief period covered by this analysis, the percentage of preterm-related infant deaths generally increased (despite some year-to-year fluctuations) from 35.4% of all infant deaths in 1999 to 36.5% in 2004, and the impact for non-Hispanic black and Puerto Rican mothers was substantially higher. Also, the group of preterm-related causes of infant death identified in this analysis probably underestimates the total impact of preterm-related infant death, as some cause-of-death categories (notably those beginning with the words “Other” and “All other”) had a high percentage of preterm infant deaths but lacked sufficient specificity to be able to establish an etiologic connection to prematurity with any degree of certainty. Continued tracking of this important group of preterm-related causes of infant death will improve our understanding of trends in infant mortality and perinatal health in the United States.

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Figures



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