
Despite substantial reductions in U.S. infant mortality during the past several decades, black-white disparities in infant mortality persist. Among 40 states with sufficient numbers of black infant deaths to generate reliable rates for the years 2002-2004, Wisconsin had the highest black infant mortality rate (IMR) at 17.6 deaths per 1,000 live births, approximately three times the state rate for whites. How-

The population of Dane County, including the city of Madison, had grown to more than 472,000 in 2007, with blacks comprising 4.8% of the total. The black population and number of black births per year in the county have approximately doubled since 1990. Black women giving birth in Dane County are predominately poor ($28,103 median household income versus $50,927 for whites), and rely on subsidized health care (62% on Medicaid versus 13% for whites) (Wisconsin Department of Administration [WDA], 2000 U.S. Census, and Wisconsin Department of Health Services [WDHS], unpublished data, 2009). The proportions of black women giving birth who are unmarried (77% versus 19% for whites), and lacking higher education (71% have a high school diploma or less versus 21% for whites) have been stable since 1990.

Wisconsin birth, infant death, and fetal death records (certificates) contain more than 100 data elements that affect birth outcomes, including infant and fetal characteristics, maternal demographics and behaviors, medical conditions diagnosed before and during pregnancy, and complications of labor and delivery. Using 97,590 birth, infant death, and fetal death records compiled by WDHS, mean non-Hispanic black and non-Hispanic white IMRs were calculated for 1990-2001 and 2002-2007. For each period, percentages and mortality rates were calculated, by race, for prematurity (defined as < 28 weeks gestation), low birthweight (defined as < 2,500 g), very low birthweight (defined as < 1,500 g), and other risk factors. Local regression was used to display the data graphically. Race of infant was assigned according to race of mother. Fetal death was defined according to the standard form used in all Wisconsin hospitals throughout the study period as any delivery of 20 weeks or more gestation or if a fetus weighs 350 g or more when death is indicated by the fact that the fetus shows no evidence of life.

During 1990-2007, 79,439 white births, 405 white infant deaths (14-38 per year), 6,410 black births, and 90 black infant deaths (1-10 per year) occurred in Dane County. During the 1990s, black-white infant mortality disparity in Dane County was relatively constant and similar to the rest of the state (a black-white ratio of approximately 3:1). In 2002, Dane County black IMRs began to decline, achieving parity with whites during 2004-2007, even though Dane County white IMRs also had improved.

Analysis of risk factors identified in birth records showed declines in smoking and teenage pregnancy (especially among persons aged 15-17 years) and an increase in high school graduation for blacks, although significant racial disparities persist. The percentage of black women receiving adequate, adequate plus, and intermediate prenatal care (measured by expected number and timing of clinical visits using the Adequacy of Prenatal Care Utilization Index [the Kotelchuck Index]) increased from 81.6% to 85.3%. Improvement in quality of care received is suggested by an increase in maternal medical conditions recorded on the birth record from 48.9% to 59.4%, and a decrease in birth record reported obstetrical complications from 50.2% to 42.5%, coupled with substantial reductions in infant mortality for black women with reported medical conditions or obstetrical complications. The decrease in infant deaths per 1,000 live births for babies born to black mothers with previous child deaths (from 84.2

The change in infant mortality risk factors for blacks that most affected the IMR over time was a decline in the percentage of extremely premature births, from 2.8% to 1.1%. The mean IMR of 391 per 1,000 for black infants <1,500 g for 1990-2001 dropped to 134 per 1,000 for 2002-2007, a decline in birthweight-specific mortality of 61%. For all races, during the 18 years studied, 70% of infant deaths occurred during the neonatal period (≤28 days of life).

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CDC Editorial Note: IMRs reflect the health of infants, their mothers, their families, and the communities into which they are born and are universally recognized as key indicators of the health of populations. The United States ranks poorly among industrialized nations in this regard, largely because of excessive infant mortality among blacks.3 Many have suggested that the black-white infant mortality gap in the United States will not decrease without reducing the high rates of extreme prematurity and very low birthweight births among blacks.3,5,6 In recent years, despite improved gestational age-specific survival, the U.S. black-white infant mortality gap has widened.7,8 In contrast, in Dane County, Wisconsin, decreases in the rates of extreme prematurity and very low birthweights and increases in birthweight and gestational age-specific survival appear to have eliminated the black-white infant mortality gap. Thus, during 2002-2007, 34 black infants who might have died, survived, and 45 who might have been born extremely premature, at high risk for life-long disabilities, were instead born at or closer to term. The apparent disappearance of the black-white infant mortality gap in Dane County is likely attributed to the convergence of the two related but independent trends: greater survival of high-risk infants and fewer high-risk infants being born. The main factors for these trends were a large decline in the extremely premature (<28 weeks gestation) birth rate and a decline in the mortality rate for babies born weighing <1,500 g. Although extremely premature babies constitute a very small percentage of total live births, their IMR is approximately 100 times that of term infants, and they account for approximately half of all infant deaths (population-attributable fraction [PAF] for all races=51%, PAF for blacks=70%).9 Extremely premature births account for the larger part of the black-white infant mortality gap in Dane County and nationally.9,10 The local trend toward fewer extremely premature births among blacks appears to have begun in the mid-1990s, followed by marked improvements in survival of extremely premature and low-birthweight infants born at local hospitals.

No significant changes in local health-care systems, infrastructure, or practice that correspond to these improvements have been identified. Nearly all (98%) of Dane County births occur at two local hospitals, both of which have full obstetrical services and level-three neonatal intensive-care units (WDA, 2000 U.S. Census, and WDHS hospital discharge data, personal communication, February 2009). No other hospitals in the county offer obstetrical services and delivery. During the study period, no changes in routine or high-risk obstetrical or neonatal referral patterns were recognized.

Factors that might contribute to improved birth outcomes are broader health insurance coverage, advances in prenatal and postnatal care, and targeted public health programs such as Perinatal Care Coordination services and the federal Women, Infants, and Children health-care and nutrition program. These targeted programs are available statewide, suggesting that differences in health-care access and quality specific to Dane County, and community quality-of-life elements, including improved neighborhood safety, organizational support and advocacy for black women and families, social inclusion, and improved economic status, might be important variables for further study.

Conclusions based on these data should be considered preliminary because closer examination of demographics trends in Dane County are needed to understand the small changes in annual number of black infant deaths. The declining black infant mortality in Dane County has continued since 2002 and coincides with a growing black population of stable fertility. The steadily declining rate of extremely premature births, which began in the mid-1990s, represents larger annual numbers than infant deaths, and thereby might provide additional insight into these trends.

The findings in this report are subject to at least four limitations. First, delivery room misclassification of infant death as fetal death might occur, thereby artificially reducing the rate of infant deaths. However, systematic misclassification appears unlikely because both fetal death and infant death declined during the study period. Second, vital records do not provide information on important contextual risk factors for infant mortality (e.g., paternal involvement and quality of prenatal care). Also, vital records have poor validity for reporting medical risk factors and complications of pregnancy, and often lack details on cause of death. Third, key health-care variables such as neonatal intensive-care unit admissions and health insurance coverage were not examined. Finally, improved or expanded birth record coding, if it occurred, might be mistaken for improvement in quality of care.

These findings should be interpreted with caution and studied further to determine if the apparent reduction in deaths is an artifact or can be attributed to yet unidentified factors, such as changes in medical care or population characteristics. PHMDC, in collaboration with state and local health departments and the Univer-
FDA Approval of Expanded Age Indication for a Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellular Pertussis Vaccine

ON DECEMBER 4, 2008, THE FOOD AND Drug Administration (FDA) approved an expanded age indication for the tetanus toxoid, reduced diphtheria toxoid and acellular pertussis vaccine (Tdap) Boostrix (GlaxoSmithKline Biologicals, Rixensart, Belgium). Boostrix is now licensed for use in persons aged 10-64 years as a single-dose booster immunization; the vaccine initially was licensed for persons aged 10-18 years. This announcement summarizes the indications for use of Boostrix. Complete recommendations of the Advisory Committee on Immunization Practices (ACIP) for Tdap vaccines have been described previously.1-3

On October 23, 2008, ACIP was presented data on the safety and immunogenicity of Boostrix in adults aged 19-64 years and notified of the impending expanded age indication for Boostrix. Guidance for the use of Boostrix is the same as for Adacel (Sanofi Pasteur, Toronto, Canada), another Tdap vaccine licensed for use in adults.

Data were reviewed by ACIP from two clinical trials conducted among U.S. adults aged 19-64 years. In both trials, the safety and reactogenicity profiles of Boostrix generally were similar to those of Adacel. For diphtheria and tetanus, immune responses to Boostrix were noninferior. Pertussis antibody concentrations for pertussis toxoid (PT), filamentous hemagglutinin (FHA), and pertactin in the first clinical trial were noninferior to those of infants after a primary diphtheria and tetanus toxoids and acellular pertussis (DTaP) vaccination series with Infanrix (GlaxoSmithKline Biologicals, Rixensart, Belgium) in a clinical trial in which efficacy of DTaP also was demonstrated.4,6 Boostrix contains the same three pertussis antigens as Infanrix but in reduced quantities.

Coadministration with influenza vaccine was evaluated in the second trial. In this trial, seroresponse to concomitantly or separately administered Boostrix and influenza vaccine Fluarix (GlaxoSmithKline Biologicals, Rixensart, Belgium) were noninferior for diphtheria, tetanus, PT, and influenza. Noninferiority criteria were marginally exceeded for FHA and pertactin responses; however, serologic correlates of protection for pertussis have not been established. Antibody levels in both groups exceeded those observed in infants after primary DTaP vaccination, in trials in which efficacy of DTaP against pertussis disease was subsequently demonstrated. Decreased immune response to Tdap pertussis antigens when coadministered with influenza vaccine has been reported previously for other U.S.-licensed Tdap vaccines.7

Indications and Guidance for Use

For prevention of tetanus, diphtheria, and pertussis, adolescents and adults are recommended to receive a one-time booster dose of Tdap. Adolescents aged 11-18 years who have completed the recommended childhood diphtheria and tetanus toxoids and pertussis vaccine (DTP)/DTaP vaccination series should receive a single dose of Tdap instead of teta-nus and diphtheria toxoids (Td) vaccine, preferably at a preventive care visit at age 11 or 12 years.1 For adults aged 19-64 years who previously have not received a dose of Tdap, a single dose of Tdap should replace a single decennial Td booster dose.2

Boostrix is now indicated for use as a single-dose booster immunization in persons aged 10-64 years. The recommended interval between 2 doses of Td-containing vaccines in adolescents and adults is at least 5 years because of concern over increased reactogenicity1,2; however, data are available suggesting that intervals as short as approximately 2 years are safe.8 An interval <5 years between Td and Tdap may be used if increased risk for acquiring pertussis (e.g., during outbreaks or periods of increased pertussis activity in the community, or among healthcare workers) exists.1,2 The safety and effectiveness of Tdap have not been established in pregnant women, nursing mothers, and children aged <10 years. Current doses in stock can be used for persons aged 10-64 years.

REFERENCES

8 Available.

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