

2008 Mississippi Infant Mortality Report¹

Presented
to

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Mississippi Senate and House of Representatives

Prepared by

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I. Introduction

The Mississippi State Department of Health (MSDH) is committed to decreasing infant mortality. The Healthy People 2010 goal is to reduce infant mortality in the United States to 4.5 deaths per 1,000 live births by the year 2010. Given Mississippi's 2007 infant mortality rate of 10.1 per 1,000 live births, an additional reduction of 5.6 deaths per 1,000 live births poses a tremendous challenge in reaching the 2010 goal.

During the past ten years from 1998 to 2007, the rate of Mississippi infants dying in the first year of life ranged from a low of 9.7 deaths per 1,000 live births in 2004 to a high of 11.4 in 2005. Each year on average, approximately 451 deaths occurred among some 43,342 births. In 2005, Mississippi ranked 50th in the nation for infant mortality.

This report describes the pattern of infant mortality, delineates contributing factors, and outlines a work plan for reducing the infant mortality rate. The Mississippi State Department of Health Vital Statistics is the principal data source.

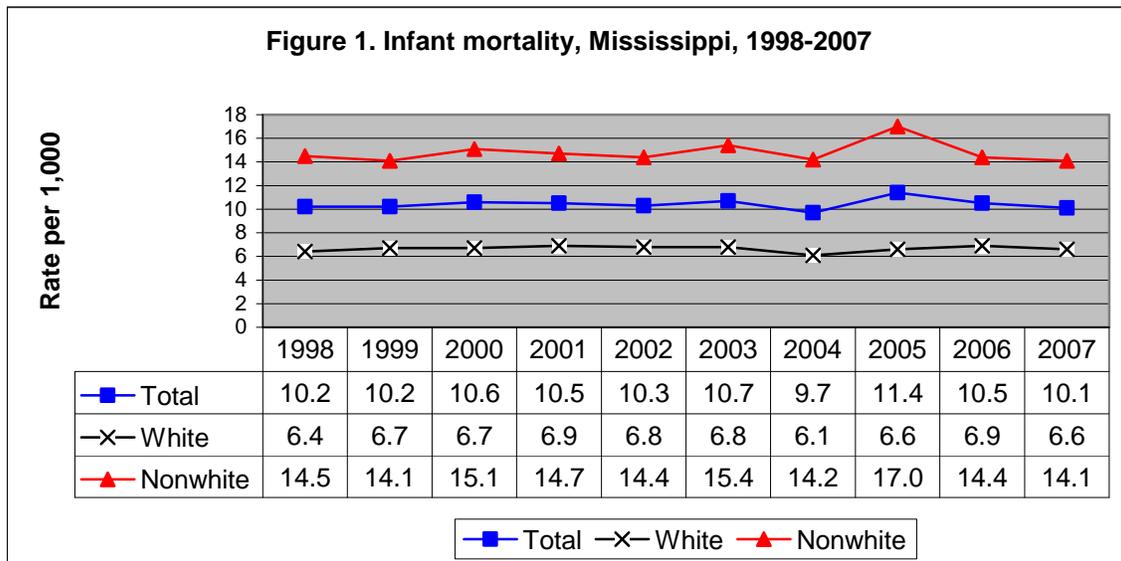
II. Data Monitoring

The leading causes of infant mortality in Mississippi are low birthweight and premature birth, followed by birth defects, Sudden Infant Death Syndrome, accidents and maternal complications of pregnancy. Maternal factors, racial disparities, and prenatal care also impact infant mortality in Mississippi. The magnitude and significance of their contribution to Mississippi infant mortality is demonstrated by the following statistics, underscoring the need to monitor these events most closely and target interventions towards reducing them.

1. Infant mortality trend

The infant mortality rate for Mississippi has shown some fluctuation during the last ten years (1998-2007) (Figure 1). The average infant mortality rate for the period was 10.4 infant deaths

per 1,000 live births. The 10-year average infant mortality rate was 6.7 for whites and 14.8 for nonwhites.



2. Infant mortality by region of state

During the period 2005 to 2007, the average infant mortality rate was 10.6 deaths per 1,000 live births in the state. In the North Region (including public health districts I-IV), the infant mortality rate fluctuated over the three years. The Central Region (including public health districts V-VI), and the South Region (including public health districts VII-IX) had a decline in the infant mortality rate (Appendix A and Table 1).

Table 1. Mississippi infant mortality rate* by region, 2005-2007

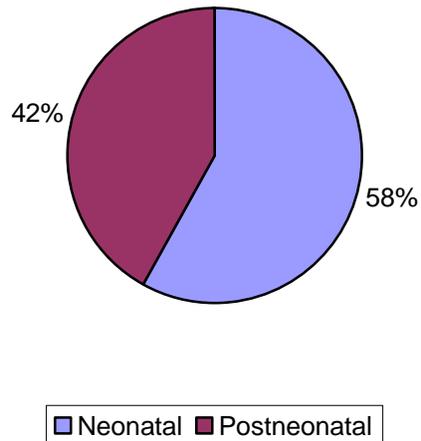
Year	North Region		Central Region		South Region		Mississippi	
	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate
2005	181	11.0	164	12.5	136	10.6	481	11.4
2006	200	11.3	155	10.9	128	9.1	483	10.5
2007	186	10.4	152	10.8	131	9.0	469	10.1

*rate, per 1,000 live births

3. Infant mortality by period of death

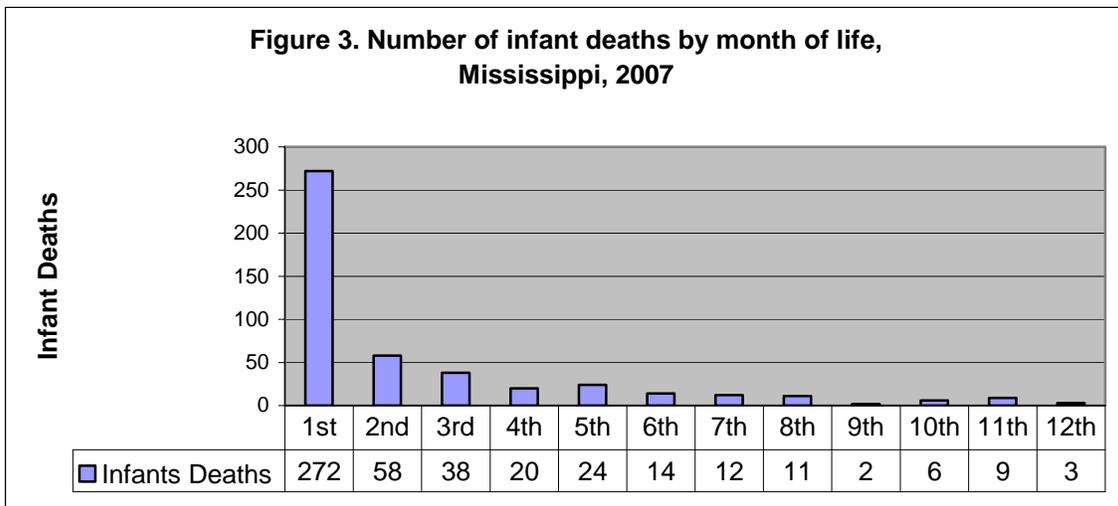
In 2007, 58% of infant deaths occurred during the neonatal period, and 42% of infant deaths occurred during the postneonatal period. Neonatal deaths take place prior to the 28th day of life. Postneonatal deaths occur between the 28th day of life and the first birthday (Figure 2).

Figure 2. Percent of infant deaths, Mississippi, 2007



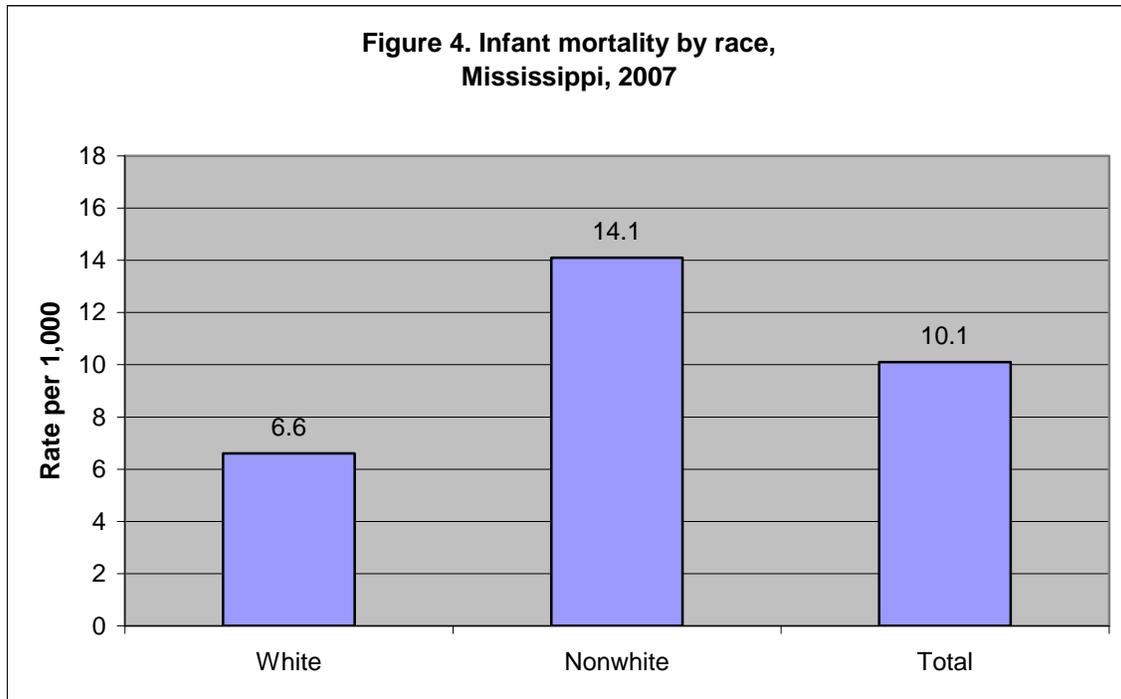
Infant age in months at time of death demonstrates that 272 (58%) of 469 infant deaths took place during the neonatal period. In addition, 116 of 469 (24.7%) occurred when infants were 2-4 months of age. The remaining deaths 81 (17.3%) were sparsely spread across the 5th through the 12th month of life (Figure 3).

Figure 3. Number of infant deaths by month of life, Mississippi, 2007



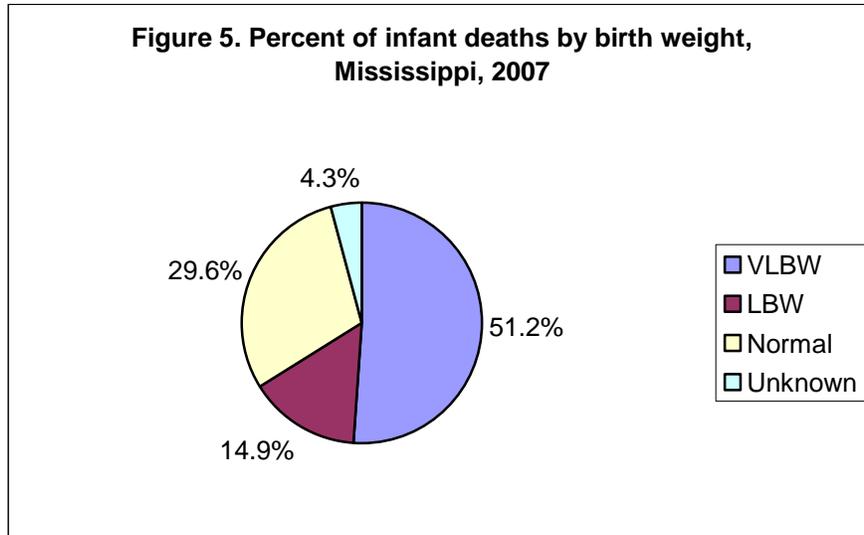
4. Infant mortality by race

In 2007, the infant mortality rate for nonwhites (95.8% of nonwhites were African Americans) was 14.1 compared to 6.6 deaths per 1,000 live births for whites. While a significant racial disparity continues to exist, the rate for nonwhites has decreased by 2.1% from 14.4 in 2006 to 14.1 deaths per 1,000 live births in 2007. The rate for whites has decreased 4.3% from 6.9 to 6.6 during the same period (Figure 4).



5. Infant mortality by birth weight

Besides birth defects, preterm birth (PTB) and low birth weight (LBW) are the most common causes of infant death. In 2007, 51.2% of infant deaths were among babies having very low birth weight (VLBW, less than 1,500 grams). Another 14.9% were those having LBW (between 1,500 and 2,499 grams). Less than one third (29.6%) of infant deaths occurred among babies with weights greater than or equal to 2,500 grams (normal weight) (Figure 5). The infant mortality rates for VLBW babies and LBW babies were 231.9 and 15.0 deaths per 1,000 live births, respectively. For babies weighing 2,500 grams or more, the rate was only 3.4 deaths per 1,000 live births.



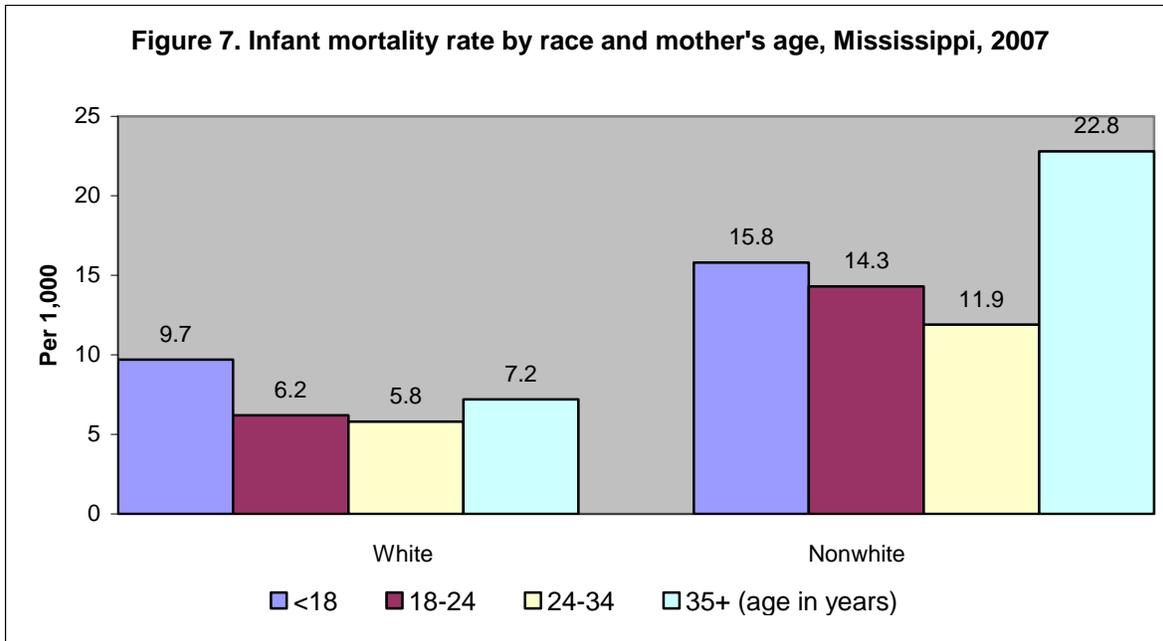
6. Infant mortality by gestational age

In 2007, 56.3% of infant deaths were among babies with a gestational age of less than 37 weeks. About 25.4% of infant deaths were among babies with a gestational age greater than or equal to 37 weeks. The infant mortality rate for babies born prematurely (< 37 weeks gestation) was about 9.5 times higher than those born full term (Figure 6).



7. Infant mortality by mother's age

In 2007, ten white infants and 28 nonwhite infants born to teen mothers (less than 18 years of age) died. Although the teen pregnancy rate has declined in the state during the past ten years, the infant mortality rate for teen mothers remained high compared to mothers in other age groups. Babies born to mothers aged 25 to 34 years had the lowest infant mortality compared to mothers in other age groups (Figure 7).



8. Infant mortality by mother's marital status

In 2007, 68.7% of infant deaths occurred among unmarried mothers. The infant mortality rate for unmarried mothers was 12.9 compared to 6.4 deaths per 1,000 live births among married mothers.

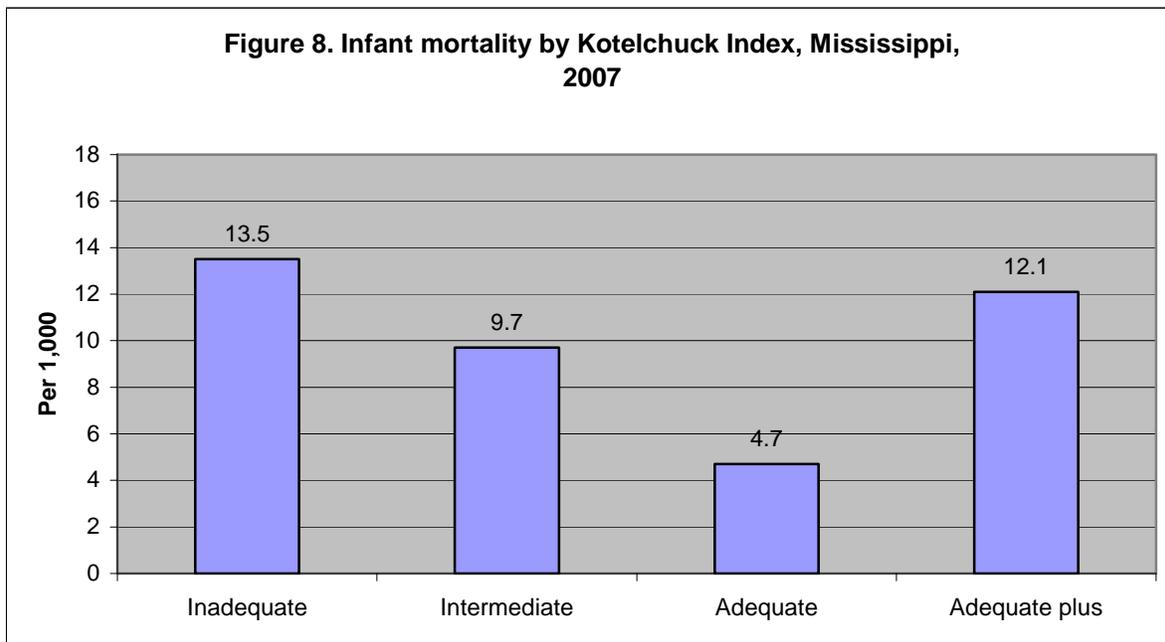
9. Infant mortality by Kotelchuck Index

The Kotelchuck Index classifies prenatal care into one of four categories by combining information about the timing of prenatal care, the number of prenatal care visits and the fetus' gestational age.

- Inadequate: Prenatal care began after the 4th month or less than 50% of recommended prenatal visits were received.

- Intermediate: Prenatal care began by the 4th month and 50% to 79% of recommended prenatal visits were received.
- Adequate: Prenatal care began by the 4th month and 80%-109% of recommended prenatal visits were received.
- Adequate Plus: Prenatal care began by the 4th month and 110% or more of recommended prenatal visits were received.

In 2007, mothers who received “inadequate” prenatal care had the highest infant mortality rate compared to those who had received “intermediate” and “adequate” prenatal care. However, the infant mortality rate for infants born to mothers who received “adequate plus” prenatal care is more than 2.5 times that of infants born to mothers who received “adequate” prenatal care. This finding suggests that mothers likely received “adequate plus” prenatal care due to high-risk pregnancy or anticipated negative outcome (Figure 8).



III. Work Plan and Progress Report

The MSDH continues to rank infant mortality as the agency’s highest priority. New programs are being implemented to address maternal and infant health in Mississippi.

1. Evidence base and background for new program

In 2006, after recognizing that preterm birth and low birthweight were major contributors to Mississippi infant mortality, MSDH conducted a study to investigate the impact of selected maternal chronic medical conditions, race, and age on preterm birth, low birthweight, and infant mortality among Mississippi mothers. The study focused on chronic medical conditions existing prior to pregnancy. The retrospective cohort analysis of infant birth certificates matched with infant death certificates included 202,931 singleton infants born to African American and white Mississippi mothers during 1999-2003.

The results indicated that preterm birth, low birthweight, and infant mortality were more prevalent among African-American women, very young women (≤ 15 years old), and women with certain chronic medical conditions including hypertension and diabetes existing prior to pregnancy. The study underscored the importance of increasing access to preconception (or pre-pregnancy) care and treating women throughout the lifespan as well as recommending training for women's health care providers in recognizing and understanding the effects of chronic disease in women. The study documented the need for preventive health care as a tool for reducing racial disparities in infant mortality. Generally speaking, healthier mothers have healthier babies. Thus, improving the health of mothers prior to pregnancy could improve outcomes for Mississippi infants and their families.

In 2006, Dr. Alfred W. Brann, Director of the World Health Organization Collaborating Center for Reproductive Health (WHO/CC/RH) and Professor of Pediatrics at Emory University began working with the Grady Memorial Hospital in Georgia to create an Interpregnancy Care Program (ICP) to determine the effects of case managed, interdisciplinary care on birth outcomes for high-risk mothers. The overall program hoped to improve the health of high-risk child-bearing women, and also sought to promote child-spacing and proper family planning practices. The study included only mothers who had just given birth to a VLBW infant, defined as less than 1,500 grams or 3.5 pounds. For two years, the mothers were offered comprehensive health services, nursing case management, and outreach services. They concluded that the ICP did allow for better identification and therefore better management of chronic disease among postpartum mothers. The ICP group's repeat births with negative outcomes were significantly

lower than those of a comparable group of women. It was determined that the estimated cost of care for one mother during the extended postpartum period was approximately \$1,800 for one year, a mere fraction of the cost of a repeat birth of a VLBW infant that can easily accrue healthcare costs ranging in the hundreds of thousands of dollars.

Given the impact of LBW on Mississippi infant mortality and the apparent success of the project in Georgia (a state with demographics similar to Mississippi), it was theorized that this type of program could be slightly modified to accommodate the needs of Mississippi mothers and infants. In 2007, Health Services at the MSDH began working in consultation with Emory University and the University of Mississippi Medical Center (UMMC) to design an ICP for Mississippi women. The recommendation for replicating the Georgia project was made by the WHO/CC/RH. Utilizing the Georgia model, two projects were devised to work with women at risk for delivering a VLBW infant. After considerable effort and struggles to secure funding, two interpregnancy care pilot projects finally began implementation in the fall of 2008.

2. New program descriptions

The communities to be served include an expanded area of Metropolitan Jackson (Hinds, Madison, and Copiah counties) and an 18-county catchment area of the Mississippi Delta (Desoto, Tunica, Tate, Panola, Quitman, Coahoma, Tallahatchie, Bolivar, Sunflower, Carroll, Leflore, Washington, Humphreys, Holmes, Yazoo, Sharkey, Issaquena, and Warren) that are predominantly African American with high rates of poverty. In these communities there exist excessive rates of LBW or VLBW deliveries (and correspondingly higher infant mortality and morbidity) and low rates of health insurance coverage and access to primary care services. The combined Delta Infant Mortality Elimination (DIME) and Metropolitan Infant Mortality Elimination (MIME) components of the interpregnancy care project give varying perspectives – urban and rural -- of implementing interpregnancy care in Mississippi. The DIME project has already been funded through the Delta Health Alliance. The program anticipates 3 years of funding in the amount of \$1 million annually. A grant application has been submitted for MIME. If funded, the project anticipates 5 years of funding in the amount of \$750,000 annually.

3. Program synopsis

The proposed project has three aims: (1) To provide primary health care, social, and community outreach services to women who deliver a VLBW infant at UMMC to improve their overall health status, and reduce their medical and social risks including achieving optimal child spacing (of 18 to 24 months) if another pregnancy is desired; (2) To reduce subsequent poor pregnancy outcomes in enrolled high-risk women; (3) To share with health care providers, policy makers, and community members in central Mississippi the contribution of VLBW infants to infant mortality and racial disparities in the state of Mississippi, experiences providing community-based interpregnancy care and outreach services to high-risk women, and how improving interpregnancy health affects subsequent health and pregnancy outcomes for high-risk women. The aims of the project will be implemented through the establishment of a collaborative ICP through MSDH and UMMC. The Program will enroll women who have recently delivered a VLBW infant at UMMC and follow them for 24 months.

Evaluation is one of the key components of these pilot projects. If the projects are proven to be effective, MSDH will apply for additional funding required to expand the projects to other areas of the state.

Appendix A: Mississippi Geographic Regions

