


8-1-2008

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### Recommended Citation

Paul, MD, David A., "Infant mortality in Delaware: the need to improve maternal health and reduce premature births." (2008). *Department of Pediatrics Faculty Papers*. Paper 17.<http://jdc.jefferson.edu/pedsfp/17>

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**As submitted to:**

***Delaware medical journal***

**and later published as:**

***Delaware medical journal***

**Volume 80, Issue 8, August 2008, Pages 289-292**

**PubMed ID: 18795726**

**“Infant Mortality in Delaware: The Need to Improve Maternal Health  
and Reduce Premature Births”**

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Infant mortality remains a difficult problem in Delaware. Delaware's infant mortality rate is substantially higher than the overall United States rate, with a recent 16% increase in infant mortality noted from 1995-1997 to 2002-2004<sup>1</sup>. During this same time period the United States rate decreased by 7%. Delaware has one of the highest infant mortality rates in the country, with rates similar to rural southern states such as Mississippi and Louisiana, rather than rates comparable to our mid-Atlantic bordering states. This editorial will review some of the potential causes of Delaware's high infant mortality rate as well as some potential solutions.

*What do we know about causes of infant mortality in Delaware?*

The leading cause of infant mortality in the United States is controversial. Traditionally, birth defects have been considered the leading cause of infant mortality. However, recent research has suggested that premature birth is likely the leading cause<sup>2</sup>. The United States is presently experiencing an epidemic of premature birth with a 20% increase in the number of preterm babies since 1990<sup>3</sup>. Delaware has a rate of premature birth of 14% compared to 12.7% nationally<sup>4</sup>. The causes of premature birth are multifactorial and include biologic, social, medical and racial factors<sup>5</sup>. There are tremendous racial disparities in rates of premature birth. African American women have a rate of premature birth of 18%, compared to 11.5% in Caucasian women<sup>1</sup>. From a medical standpoint, little can be done to stop advanced premature labor. Administration of weekly doses of 17 hydroxy- progesterone has been shown to reduce the risk of preterm birth in women who have had a previous premature infant<sup>6</sup>.

Although many advances have been made in the care of premature infants, recent evidence suggests that there have been little advancement in survival rates of those infants born very low birth weight (<1500 grams)<sup>7,8</sup>. Despite advances in perinatal care, including the administration of antenatal corticosteroids, antenatal antibiotics, high frequency ventilation, and postnatal surfactant, infants born extremely prematurely remain at high risk of death and/or surviving with a disability<sup>9</sup>. Corresponding to the national increase in premature birth, the number of very low birth weight infants (VLBW, <1500 grams) cared for in the Neonatal Intensive Care Unit at Christiana Hospital increased 55% between 1994 and 2006. This increase in the number of premature infants, at a time corresponding to stagnation of outcomes, has led to an increased number of deaths of premature infants.

In addition to an increased number of premature births, we have recently demonstrated an increase in illness severity in VLBW infants in Delaware<sup>10</sup>. The observed increase in illness severity was accompanied by a decrease in stillbirths, suggesting a shift from stillbirths to live births of extremely ill premature infants. In support of this hypothesis, shifts from stillbirth to live premature births have been shown in other populations<sup>11</sup>, and stillbirths have been shown to be decreasing nationally<sup>1</sup>.

Similar to the observed disparities in preterm births, racial disparities in infant mortality rates exist both nationally and in Delaware. Infants born to African American women in Delaware are more than twice as likely to die prior to their first birthday compared to

infants born to Caucasian mothers or Hispanic mothers. The reasons behind this elevated disparity ratio remain elusive but are likely multifactorial. One recent focus of investigation into the causes of infant mortality in Delaware has been racial disparities in delivery of health care. African American mothers delivering VLBW infants are less likely to receive antenatal corticosteroids, tocolytic medications and Cesarean deliveries compared to Caucasian mothers <sup>12</sup>. In other regions of the country, racial disparities in delivery of neonatal intensive care have been associated with increased black infant mortality <sup>13</sup>.

Delaware may be considered at “high risk” for having an increased infant mortality rate based on the racial demographics of the state. As African American infants have a risk of infant mortality twice that of Caucasian infants, states with a higher percentage of African American population would intuitively have high infant mortality rates. The demographic make-up of Delaware is 20.7% African American compared to 12.4 % nationally <sup>14</sup>. However, our recent analysis indicates that the infant mortality rate in Delaware remains high after adjusting for the population demographics of the state <sup>15</sup>. Furthermore, in this analysis adolescent pregnancy and smoking during pregnancy were identified as factors which are potentially amenable to intervention and could be targeted to decrease the risk of infant mortality <sup>15</sup>.

### *Social Factors Contributing to Infant Mortality*

Infant mortality is as much a social issue as a medical issue. In order to reduce infant mortality in Delaware we will have to make important social gains. With 12% of Delaware residents lacking health insurance, access to basic health care is limited to a large percentage of our population <sup>16</sup>. Employment remains the principle source of health care insurance in our country. Disappointingly, the high school graduation rate in Delaware is only 73% <sup>16</sup>. With education levels linked to employment opportunities, the number of uninsured Delawareans is likely to continue to climb.

Family support is a critical component of child-rearing. Traditionally, research surrounding premature birth and infant mortality have centered on maternal factors. The role of paternal factors and family support networks in Delaware need closer investigation. Fathers play an important role in family economic viability and support. Fathers also play an important role in maternal health through transmission of diseases such as HIV and other sexually transmitted diseases. Births to unmarried mothers have been climbing steadily on a national level <sup>1</sup>. In Delaware, 44.3% of live births were to unmarried mothers in 2005, compared to 36.9% nationally <sup>4</sup>.

Improved access to health care and strengthened family structures are only two examples of social issues that interface with infant mortality. Neighborhood safety, housing, transportation and racism are examples of other social problems which have been linked to infant mortality in other regions and need to be improved in Delaware.

*Preconception health care: a paradigm shift*

In order to decrease premature births in Delaware, and subsequent infant mortality, we need to vastly improve the health of women of child-bearing age. This includes better control of conditions such as obesity, diabetes, hypertension and smoking, all of which have been linked to premature birth. In Delaware, 22% of the population smokes and 26% are classified as obese<sup>16</sup>, evidence of the poor overall health of the state population. In April, 2006 the CDC published guidelines to improve preconception health in women of childbearing age<sup>17</sup>. Preconception health care is not a single visit but a process of care. Preconception care aims to keep a mother healthy prior to pregnancy, not waiting for prenatal care to begin the process of risk reduction. Under the paradigm of preconception health care, any health care encounter with women of childbearing age should be considered an opportunity to improve preconception health.

Many new initiatives to improve preconception health have been funded as part of State of Delaware infant mortality programs. Christiana Care Health Services, St. Francis Hospital, Westside Clinic, La Red, Delmarva Rural Ministries and the University of Delaware all have recently started preconception health programs. These programs, if successful, should improve the future health of women of childbearing age in our state. In addition, Delaware is one of the few states in the nation to have made 17 hydroxy-progesterone available to low-income women at risk for recurrent premature birth.



### *Summary*

Delaware's high infant mortality rate continues to be driven by an increasing number of premature births. Premature birth is a complex problem with both social and medical roots. Based on the CDC road map, programs aimed at improving preconception health of women of childbearing age are blossoming in Delaware. In addition, Delaware's infant mortality rate can only be reduced if we are able to diminish disparities in health care delivery, and improve the social factors influencing infant mortality. These factors include diminishing family support, low high school graduation rate, poor housing, and a lack of health insurance.

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