Issue Brief

Examining Rhode Island Mothers Who Have Given Birth to a Low Birth Weight Infant, 2012-2015

Josephine Airoldi, MPH candidate, School of Public Health, Brown University

Definition and Significance

Low birth weight continues to be a significant public health concern. Low birth weight is defined as an infant weighing less than 2,500 grams (five pounds, eight ounces).[1] In 2015, more than 320,000 babies in the United States were born with a low birth weight, and about one in 12 births (8%) of all babies born in that year.[2] An infant might be born with a low birth weight due to premature birth or fetal growth restriction. Premature birth happens when the birth occurs before 37 weeks of gestation.[3] Fetal growth restriction (also called small for gestational age) occurs when a baby does not gain the weight they should before birth.[3] Certain maternal risk factors can also predispose a mother to give birth to a low birth weight infant. Associated risk factors include adverse health behaviors (tobacco, alcohol, and drug use), domestic violence, high blood pressure, diabetes, specific prescription medications, and not gaining enough weight during pregnancy.[3] Low birth weight is a major determinant of mortality, morbidity, and disability in infancy and childhood, and can have long term effects on health outcomes in adult life through respiratory, cognitive, or neurological complications.[1] This data brief will explore the prevalence of mothers giving birth to a low birth weight infant and describe certain populations of mothers at greatest risk for giving birth to a low birth weight infant, using the 2012-2015 Rhode Island Pregnancy Risk Assessment Monitoring System (PRAMS) data.

Methods

The goal of the PRAMS survey is to improve the health of mothers and infants by providing accurate data to a wide audience. The Rhode Island PRAMS program is conducted through a collaboration between the Rhode Island Department of Health (RIDOH) and the Centers for Disease Control and Prevention (CDC), and surveys about 1,900 recent mothers per year. Responses are weighted to be representative of women who delivered a live infant in Rhode Island from 2012-2015. More information is available on the PRAMS website.[4,5]

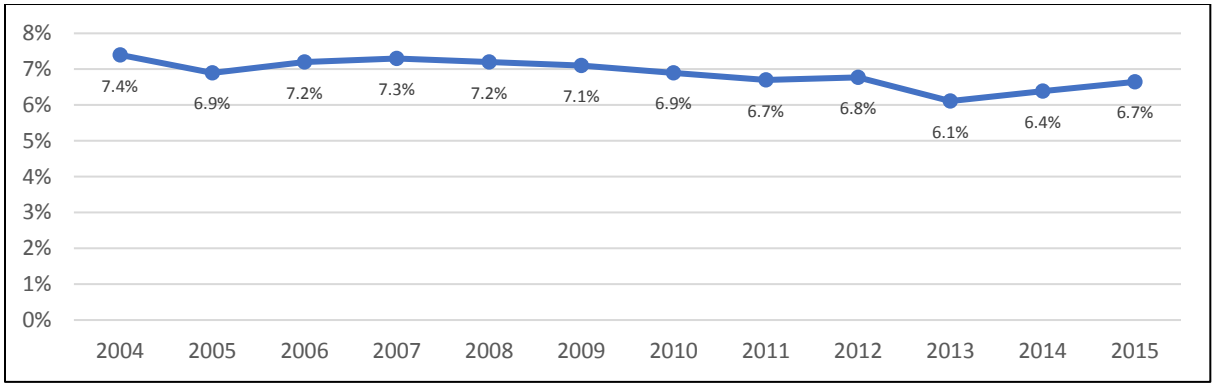
Assessing Low Birth Weight Using PRAMS

The birth weight of an infant in the PRAMS data is collected from the RIDOH's Center for Vital Records and used to determine the low birth weight status of the infant.[2] Using a combination of data from Rhode Island PRAMS respondents from 2012-2015, a birth weight variable was created either denoting normal birth weight (greater than or equal to 2,500 grams) or low birth weight (less than 2,500 grams). Univariate analyses were performed to determine the overall prevalence of mothers who had low birth weight infants and cross tabulations were performed to identify groups of mothers at higher risk for having low birth weight infants.

Results: Prevalence and Trends of Low Birth Weight, 2004-2015

The proportion of Rhode Island mothers who had a low birth weight baby has decreased from 7.4% in 2004 to 6.7% in 2015. This linear trend is statistically significant but has been relatively stable from 2010 to 2015. Analyses revealed that in 2015, 6.7% of mothers gave birth to a low birth weight infant, whereas 93.3% of mothers gave birth to a normal birth weight infant. Trends data were analyzed to see how the percentage of mothers having a low birth weight infant has improved throughout the years, gradually and significantly decreasing from 7.4% in 2004 to 6.7% in 2015 (linear trend: $p<0.001$).

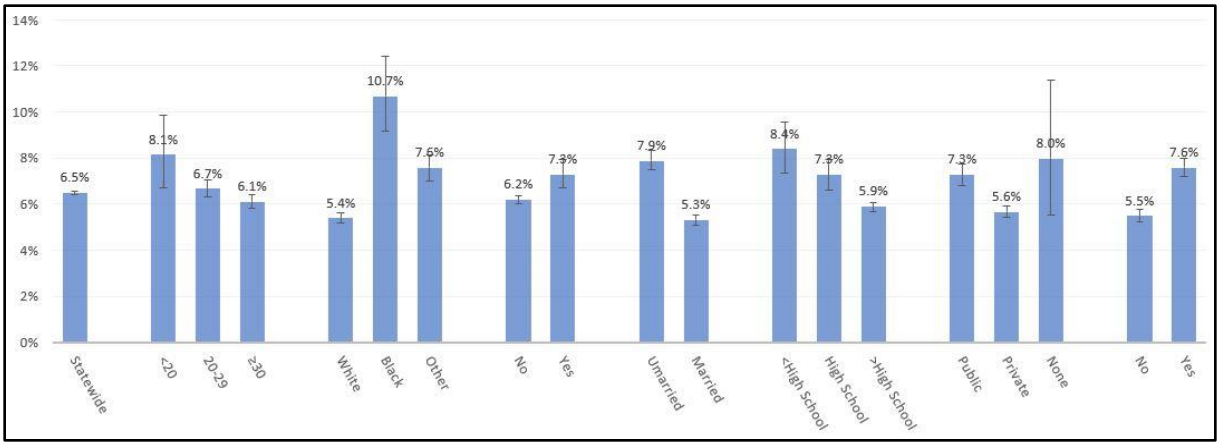
Figure 1: Mothers With a Low Birth Weight Infant, By Year, Rhode Island, 2004-2015



Results: Prevalence of Low Birth Weight by Demographic Characteristics, 2012-2015

The overall prevalence of Rhode Island mothers with a low birth weight infant was 6.5%. Demographic characteristics that were significantly (p-value less than 0.05) associated with low birth weight infant included age, race, ethnicity, marital status, education, health insurance type, and participation in the Women, Infants, and Children (WIC) program. Mothers who were younger than 20 (8.1%), Black (10.7%), Hispanic (7.3%), unmarried (7.9%), had less than 12 years of education (8.4%), had public health insurance (7.3%) or no health insurance (8.0%), and participated in the WIC program (7.6%) had a higher prevalence of low birth weight infants than their counterparts.

Figure 2: Mothers With a Low Birth Weight Baby, By Demographic Characteristics, Rhode Island, 2012-2015

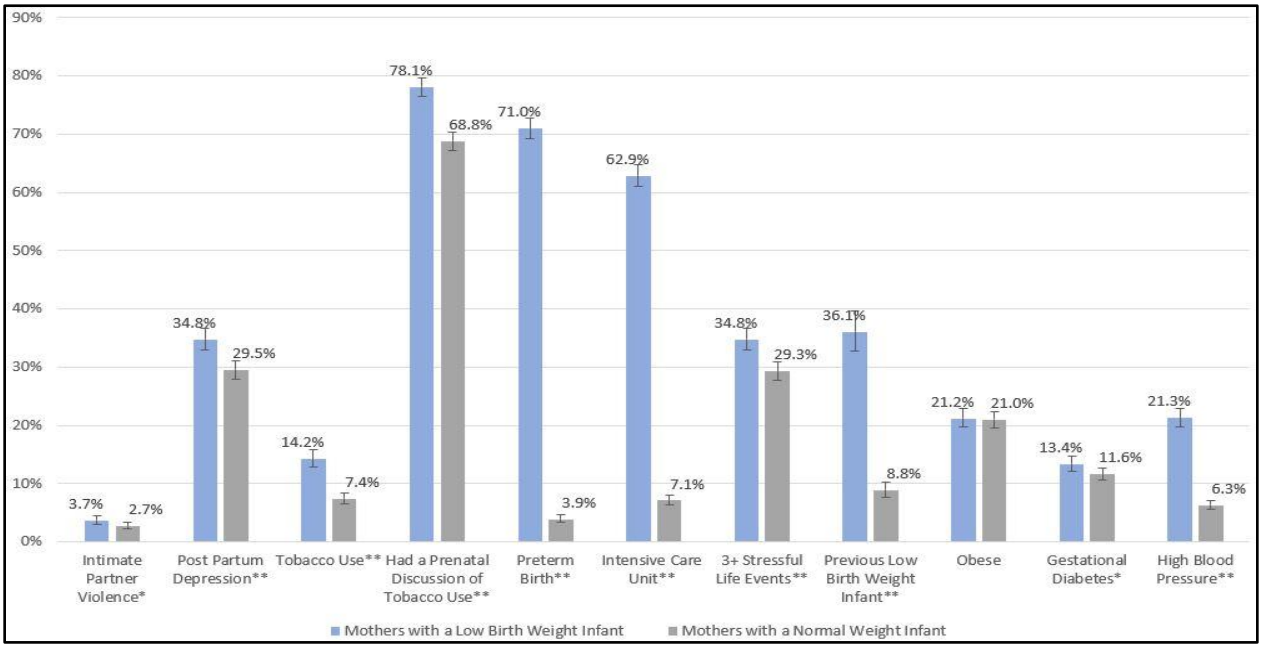


**p-value < 0.05 **p-value < 0.01*

Results: Prevalence of Risk Factors and Adverse Outcomes by Birth Weight Status, 2012-2015

Mothers that gave birth to a low birth weight infant compared to mothers who gave birth to a normal birth weight infant were significantly more likely to report various risk behaviors and adverse health outcomes. These include: experiencing intimate partner violence (IPV) during the 12 months before pregnancy or during pregnancy (3.7%), experiencing post-partum depression (34.8%), smoking during their pregnancy (14.2%), had a discussion about tobacco use (78.1%), had a preterm birth (71.0%), their infant was placed in the intensive care unit (ICU) after birth (62.9%), experienced three or more stressful life events (34.8%), had a previous low birth weight infant (36.1%), had gestational diabetes (13.4%), and had high blood pressure (21.3%).

Figure 3: Risk Behaviors and Adverse Outcomes, By Birth Weight Status, 2012-2015



**p-value < 0.05 **p-value < 0.01*

Limitations

The PRAMS survey instrument relies on self-reported measures from respondents with no clinical means to assess every measure. Infant's birthweight is collected from the birth certificate which yields accurate measurements, but other variables assessed produce limitations. Self-reporting can sometimes lead to biased reporting of information as respondents may report incorrectly or feel pressured to report based on societal standards, such as perceiving increased stress during pregnancy to account for their adverse birth outcome or report no unhealthy pregnancy behaviors as they feel guilty for giving birth to a low birth weight infant. Recall bias may also come into play with the way PRAMS is implemented. Since the respondent fills out the survey postpartum and some questions pertain to before the respondent got pregnant (experiencing stressful life events during the 12 months before the baby was born), they may incorrectly recall the information. The cross-sectional survey design does not allow for causality to be drawn, although circumstances can be suggested to contribute to increasing a mother's risk of giving birth to a low birth weight infant. Lastly, data collection from vulnerable subjects who were not able to be reached by mail or telephone may underestimate prevalence of mothers giving birth to a low birth weight infant.

Discussion of Public Health Implications

Low birth weight is a major determinant of the overall neonatal mortality rate for Rhode Island, but also a crucial factor in the differences in neonatal mortality rates among various subgroups of mothers within the population of Rhode Island.[4] These analyses identified mothers younger than 20, Black mothers, mothers with less than 12 years of education, and unmarried mothers at an increased risk. Screening for risk factors for low birth weight such as intimate partner violence, tobacco use, experiencing stressful life events, having a previous low birth weight infant, high blood pressure, and gestational diabetes should be discussed with potential

mothers so they are aware of the adverse health risks for their infant. Management of other risk factors, such as gestational diabetes and high blood pressure during pregnancy, need to be discussed and monitored to ensure mothers do not increase the risk of giving birth to a low birth weight infant. Low birth weight and preterm birth may occur concurrently, which accounts for the high prevalence of preterm birth. Since demographic characteristics and risk factors may be the same for mothers who give birth to a low birth weight infant as well as a premature infant, distinguishing the findings and recommendations from those of preterm birth is challenging. Premature infants may experience different health complications after birth such as apnea and anemia.[3]

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