

# **Disadvantaged from Birth: Low Birth Weight and Socioeconomic Class**

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## I. Introduction

All children have best friends – some one to sit by at snack time, take naps next to and play with – they don't have to be real, they just need to have a lot in common. Rene (pronounced Re-Nay) and LeMarr are two very real little boys and are absolutely best friends who affectionately call each other 'Nay-Nay' and 'Mar-Mar'.<sup>1</sup> They are both five years old, love *Dora the Explorer*, playing 'monster', and graduated from *World of Care*, a specialized daycare center for children with medical needs, to go on to regular pre-school at the end of this past summer.

But their similarities don't stop with favorite cartoons and activities. Rene and LeMarr were both low birth weight (LBW) babies, LeMarr being born at only one pound. Since birth they have both received supplemental nutrients through a Gastrointestinal (G.I.) tube, having problems ingesting food by mouth. And this summer, their tubes were removed in the same week. I remember Rene running up to me the morning after his surgery pulling up his shirt and yelling "Tricia! Tricia! Look, my button's gone!" He was so proud. (A button is a plastic insertion in a child's stomach to which a food pump tube is connected.) LeMarr and Rene both have happy endings of overcoming their disabilities with help from the *World of Care*.

But not all LBW children have futures as bright as Rene and LeMarr. LBW can translate into a number of cognitive and physical developmental problems that can perpetuate throughout life "which limit their opportunities to lead full and productive lives" (Shiono and Behrman 4). LBW is defined as less than 2,500 grams (about 5 pounds, 8 ounces) and very low birth weight, VLBW, is less than 1,500 grams (about 3 pounds, 4 ounces) (CTDB). Some LBW babies are healthy, born on time, and are simply smaller. Most however, are underdeveloped due to a

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<sup>1</sup> The names used throughout the paper are pseudo names to protect the privacy of the children at PACT.

premature birth, growth retardation in the uterus, or a combination of the two (MOD). Growth retardation and pre-term births lead to LBW and are associated with overlapping pre-natal risk factors. Efforts to decrease these pre-natal risk factors with social policy have not had a large effect on U.S. LBW as the LBW rate continues to increase. This suggests that alternative remedies and approaches to LBW need to be researched and investigated, and that more facilities for LBW children need to be established to accommodate their increasing number.

But in addition to researching remedies for the prevention of and better care for LBW infants, more information on the factors that contribute to a child's resilience is necessary. As defined by Emmy Werner of the University of California at Davis,

The concepts of resilience and protective factors are the positive counterparts to the constructs of vulnerability (which denotes an individual's susceptibility to a negative outcome) and risk factors (which denote biological or psychosocial hazards that increase the likelihood of a negative developmental outcome) (Werner 97).

Clearly, Rene and LeMarr had a higher resilience than some of their other LBW peers, allowing them to overcome their disabilities. Multiple factors in a child's environment determine his or her resilience and hence, his or her mental ability to cope with physical handicaps and other stressors such as LBW. These factors will be discussed later in the paper in relation to the consequences of LBW and how they affect not only the infant but the entire family.

Just as multiple factors contribute to a child's resilience, multiple people are responsible for a child's overall well-being. The mother, the family, the doctor, society, health care policies, and social policies are all responsible. There needs to be a balance between medical practice and social policy. Families, social workers and doctors need to work together to personalize policies that require our society to meet the needs of LBW children. PACT is one such organization that brings this idea to life in its daycare center, *World of Care*, and it has proven effective.

This paper looks into both the causes of LBW and its consequences on the physical and cognitive development of children and their resilience. It investigates how socioeconomic class can be involved in these causes and consequences by comparing factors involved in pre-natal and neonatal care including programs like WIC, access to medical care and NICUs. It focuses specifically on how these factors directly affect the infant's likelihood for survival and success both as an infant and a young child. "Babies who are very low in birth weight...have a 25 percent chance of dying before age one" (CTDB). The paper concludes with proposed remedies such as early intervention, prevention and holistic care for both pre-natal mothers and LBW children like that offered at PACT.

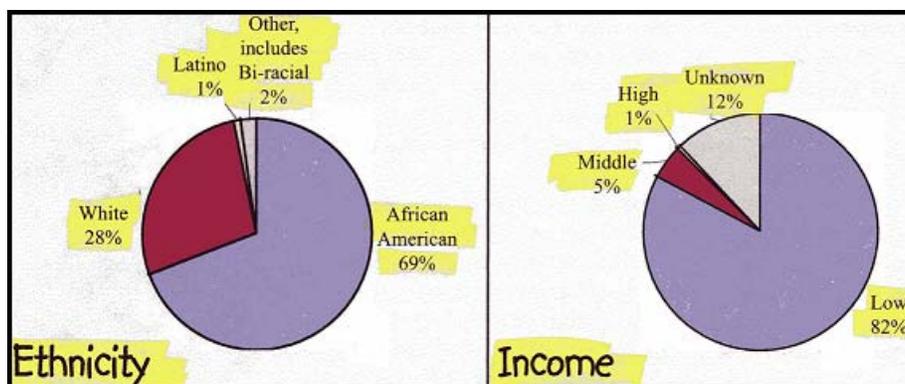
## II. Low Birth Weight and Socioeconomic Status

### Identifying Trends:

Although socioeconomic class cannot be directly correlated to race or ethnicity, to simplify data, most researchers classify according to race. However, correlations between race and socioeconomic status, SES, make the conclusions of these studies pertinent. The numbers of LBW children and consequent rates of infant mortality are shocking when comparing different races and ethnicities.

Non-Hispanic black infants are more likely than babies of other races to be low birth weight. In 2005, 14.0% of non-Hispanic black infants were low birth weight compared with 8.0% of Asians/Pacific Islanders, 7.4% of American Indians/ Alaska Natives, 7.3% of non-Hispanic whites, and 6.9% of Hispanic infants (CTDB).

Black infants are twice as likely to be LBW as any other race or ethnicity. Accordingly, PACT serves predominately more Blacks than any other race, and more members of lower SES; below are the demographics of PACT's clients.



*Figure 1. Demographics of PACT clientele (PACT 6).*

Working with children from low income families was sometimes as heart-breaking as working with children that were terminally ill. Watching a child's face fill with confusion and sadness after explaining that he has no lunch that day was horrifying. On Thursday, July 20<sup>th</sup>, I journaled the following:

Once, again, we were at the lunch table. Jill [a fellow intern] and I are passing out the children's lunches: bowls of ravioli, a corn dog for Suzzie, Alisha had her french fries that she never finishes, and more. But there was nothing for Nay-Nay. Looking around, I see in this little five-year-old's big, brown eyes, the realization that he has nothing. And the tears that stream down his face are the real kind, accompanied with almost no noise. I can't even begin to understand what he felt at that moment, but I don't think it was simply hunger. There was more to it than a physical pang, there seemed to be a deeper, emotional breakdown caused by a feeling of abandonment, embarrassment, anxiety, and confusion.

Rene's father worked at a KFC around the corner from PACT, and yet Rene had nothing to eat for lunch. He was eating everything by mouth at this point and it was so encouraging watching him progress, but this day in particular was excruciating instead. I was lost as to how to begin comforting him as I overheard one staff member say "I guess the paycheck wasn't as big this week." Not bringing home a big enough paycheck not only affects children's hunger, but is almost directly proportional to the probability of LBW in a family. Figure 2 below relates income and incidence of LBW. There are plots adjusted for certain SES factors and others for

sociodemographic factors but regardless, the trend remains the same: as income increases, LBW decreases (Finch 1826).

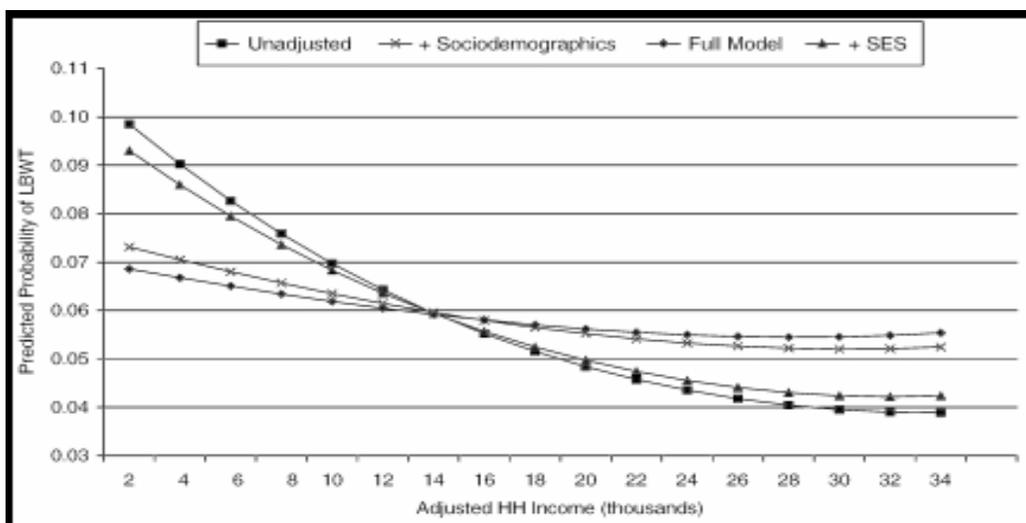


Figure 2. Predicted Probabilities for Low Birth Weight by Income (Adjusted and Unadjusted) (Finch 1831).

Because the effects of poverty on LBW and health are multi-faceted, and the effects of race are not completely understood (generations of poverty, biological or other social and cultural factors could be involved) a concrete connection between race, SES, and LBW cannot be drawn (Hughes and Simpson 89). However, correlations between black families, low SES, and high incidences of LBW are so strong that the data measuring these correlations are significant.

### Perpetuating the Trends:

Determining whether a child will escape poverty, or survive LBW is a measurement of resilience, i.e. the ability to withstand negative risk factors and thrive in the face of stressors like LBW. Many factors contribute to an infant's resilience, both internal and environmental. These factors vary with the child's age but both involve the development of strong coping methods which are critical for resilience (Werner 98, 103). Werner researched several specific factors that develop and shape these methods including birth order, the presence of a caring and nurturing adult (a grandparent, or older sibling), faith, friends, and schooling. These contributions involve

relationships and positive influences with children that create interactions that enforce each other. For example, a child's temperament and behavior will affect the amount of attention and kind of treatment he/she receives which will in turn foster this temperament (Werner 105-110). LBW and low SES will generally result in low resilience; ironically, more resilience is necessary to combat these risk factors but it is these very risk factors that lower resilience in the first place.

LBW can indicate SES, just as SES can predict LBW. "Virtually all of the several indicators of parent's social position (occupation, educational achievement, income, marital status) which are associated with infant mortality exercise their effect by altering the birth weight distribution" (Paneth 21). To break the cycle between LBW and low SES, understanding resilience and what factors can give infants and children the extra armor to battle their additional obstacles in both of these disadvantaged brackets is critical.

### III. Problems with Low Birth Weight

#### *Cost to Society and Families:*

The immense costs of LBW children make the cycle between LBW and low SES even harder to break. Like most diseases, LBW affects people of lower socioeconomic class disproportionately. Studies have shown that in the United States, as SES decreases, rates of LBW increase (Hughes and Simpson 88). Lewit and his co-workers assessed the costs of LBW children using data taken in 1988 (the latest available national data on items such as costs of LBW medical care, special education, grade retention, and preschool programs) by subtracting the cost associated with normal birth weights from the cost associated with LBW (Lewit et al. 36). The study focused on the additional utilization of resources and costs accrued by LBW children. Figure 3 below is a summary of the findings of their research.

Birth Weight Group	Number of Births, 1988	Incremental Cost per Birth, 1988 Dollars	Total Incremental Cost, 1988 Dollars (billions)	Percentage of Total Health Care Costs for Infants
Normal birth weight (≥2,500 grams)	3,600,000	\$ 1,900	\$ 7.40 <sup>b</sup>	65%
Low birth weight (<2,500 grams)	271,000	15,000	4.00	35%
Extremely low birth weight <sup>c</sup>	57,000	32,000	1.80	16%
Other low birth weight <sup>d</sup>	214,000	10,000	2.20	19%

<sup>a</sup> Columns and rows may not add or multiply exactly because individual entries have been rounded.  
<sup>b</sup> Includes nonincremental costs of 271,000 low birth weight babies.  
<sup>c</sup> Includes infants weighing 1,000 grams or less at birth or being diagnosed as having respiratory distress syndrome.  
<sup>d</sup> Includes infants weighing 1,000 to 2,500 grams without respiratory distress syndrome.

Figure 3. Health Care Costs During the First Year of Life by Birth Weight Among All U.S. Infants in 1998 (Lewit et al. 41).

Of the estimated \$11.4 billion spent on health care for infants in 1988, 35%, or \$4.0 billion, was for the incremental costs incurred by low birth weight infants. On a per-infant basis, this amounted to almost \$15,000 additional for each of the 271,000 infants born weigh less than 2,500 grams in 1988 (Lewit et al. 40).

Natality statistics for 1988 from The National Center for Health Statistics indicated that 6.9% of births were LBW (among black births, LBW had a 13.0% incidence and white births had a 5.6% incidence) (USDHHS-1 6). This means that in 1988, 35% of total infant health care costs were spent on only 6.9% of infants. Considering the advances in neonatal care technology and inflation, these costs have drastically increased over the past twenty years. In fact, \$15,000 in 1988 was equivalent to \$25,661.90 in 2006 and the total \$4.0 billion would have been \$6,843,174,044.94 last year (Friedman). This enormous financial burden is being shared both by society and these infants' families; if we could cut the rate of LBW in half to about 3.5% (comparable to that of Norway or Sweden) about 3.4 billion dollars could be saved annually. LBW not only comes with a large monetary price tag, it has immediate and long-term health consequences that can impair a child's physical and mental development further lowering his or her resilience and potential escape from low SES.

### Infant Mortality:

LBW infants are at a higher risk for mortality than infants of normal birth weight. Three quarters of infant mortalities occur within a year of birth, with one percent occurring in the first few weeks of life; because birth weight is a direct implication of the progress of the pregnancy and health of the infant, it is also directly related to the infant's survival (Paneth 20). "Low Birth weight is the second leading cause of infant mortality in the United States after birth defects" (Reichman 92). Out of the 28,034 deaths of infants younger than one year in 2002, LBW and short gestation were the cause of 4,637, or 16.54%. This is a close second behind congenital anomalies with 20.06% (Statistics Top 10). The overall infant mortality rate in the United States has steadily declined since the 1980s thanks largely in part to our country's advances in neonatal intensive care. However, the incidence of VLBW and LBW infants have not changed, and have even increased (Shiono and Behrman 5). Figure 4 displays these trends graphically.

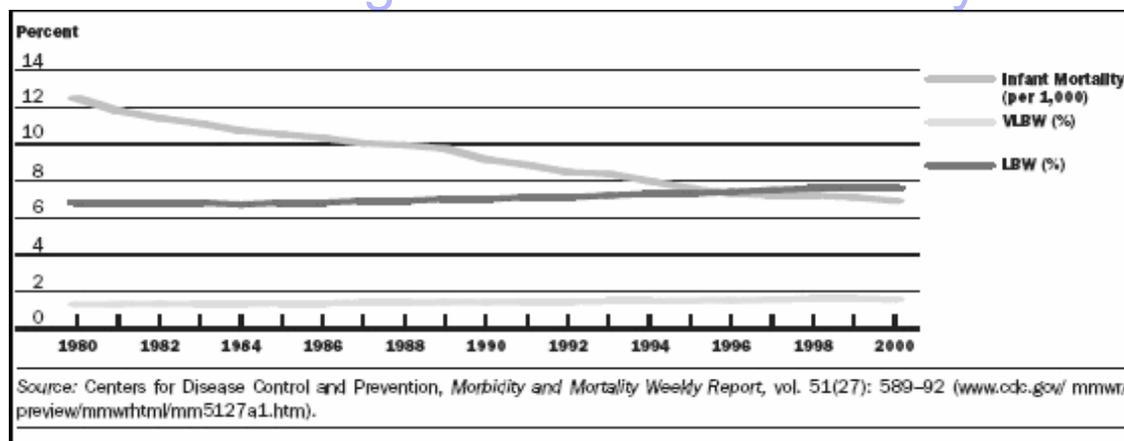


Figure 4. Low Birth Weight, Very Low Birth Weight, and Infant Mortality Rates, United States, 1980-2000 (Reichman 93).

Despite the decline in U.S. infant mortality, a CNN article reported only last May that the "U.S. has the second worst newborn mortality rate in the developed world" (Green). To compound this, in the 2004 issue of *Children's Health*, a publication of The Health Resources

and Services Administration's Maternal and Child Health Bureau, was a graph comparing infant mortality rates of 28 industrialized nations. The United States is ranked 27, above only Cuba (USDHHS-2). Figure 5 below shows an international comparison of LBW and infant mortality numbers; where numbers are missing, data was not available (Paneth 23).

Infant mortality clearly remains a serious problem in the United States which will only be exacerbated by the increasing incidence LBW infants. Although new neonatal technology has helped to save more LBW and VLBW infants over the past few decades, long-term consequences of their birth weight will affect the rest of their lives.

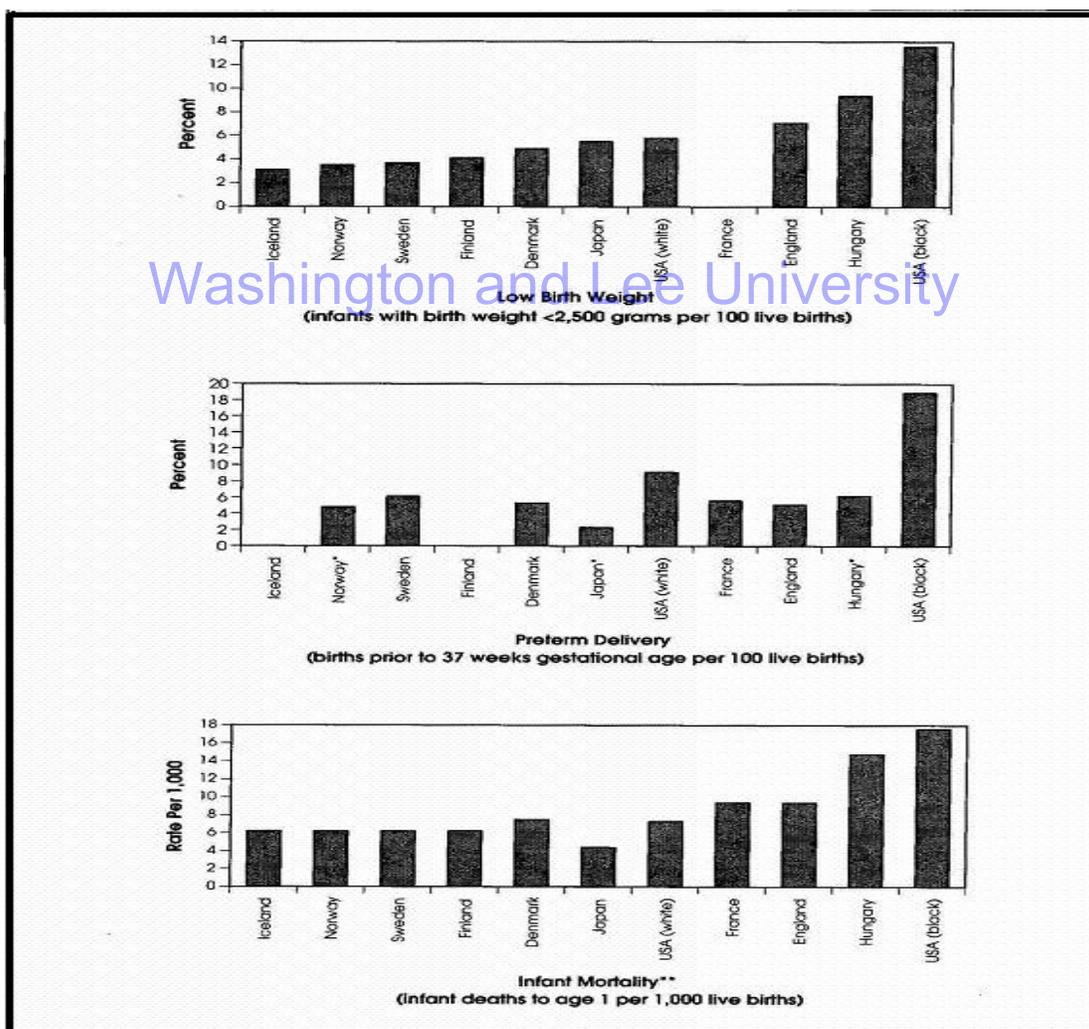


Figure 5. International Comparisons of Birth Outcomes from 1991 (Paneth 23).

*Physical and Cognitive Development (long and short term):*

LBW children are at a higher risk of chronic bad health which will affect their learning, social skills, and everyday areas of their lives. According to Maureen Hack and her coworkers, LBW children have higher incidences of mental retardation, cerebral palsy, blindness, deafness, psychomotor problems, school failure, subnormal growth, and health problems (179). Children with these disabilities face more obstacles than other children. Daycares do not accept children that require special medical attention due to the liability involved in caring for such a child. Children born with Respiratory Distress Syndrome (RDS) may need mechanical assistance with breathing and additional oxygen; blind children need special attention and stimulation to enhance their other sensory development; and children who are physically disabled need to be in a handicap-friendly environment. Other severe medical problems more common in LBW babies include Patent Ductus Arteriosus (PDA), a condition in which the baby's blood is still bypassing its lungs as if it were still in the womb; Necrotizing Enterocolitis (NEC), an intestinal problem that "can lead to feeding difficulties, abdominal swelling and other complications"; Retinopathy of Prematurity (ROP) that can cause vision impairment; and bleeding in the brain which can lead to brain damage (MOD).

Although PACT keeps records of their clients confidential, even from volunteers like me, working with the same children every day during the summer gave me a clear picture of their medical problems. The list of severe medical problems associated with LBW infants reminded me of the children I worked with there who I knew for the most part to be premature and/or LBW. Every morning around 11:00, the children in the *World of Care's* infant room went down for a nap after a snack. Rudy took his naps in a crib not with a stuffed animal, but with an oxygen tank. He laid face up with an oxygen mask covering his tiny nose and mouth. Rudy

suffered from a respiratory disorder, probably RDS; he will likely have breathing problems the rest of his life. This may not seem severe, but breathing disabilities can interfere with both learning and social progress. Rudy was just an infant and already suffering from LBW by not being able to breathe properly. Doctor appointments caused him to miss days in the daycare; absences at PACT are probably a precursor to his future school attendance record. Just as Rudy's physical health will impair other areas of his development, LBW children in general will perform below average in academic and social areas. Looking forward to Rudy's 5-year-old counterparts, Rene and LeMarr, LBW children will face the consequences of their birthweights on a daily basis. Both LeMarr and Rene probably suffered from NEC, the reason for their GI tubes, and LeMarr's thick glasses could have been a consequence of ROP. The additional obstacles LBW children need to overcome to be on the same playing field as their normal birth weight peers are substantial. Considering Rene and LeMarr's ability to overcome disabilities and have consistent attendance, social skills, and the cognitive ability to enter a non-medically based pre-school is a phenomenal accomplishment.

LBW children are more likely to score in the 'deficient' and 'subnormal' levels on intelligence quotient (IQ) tests – these would correlate to numbers 70-84, and below 70 – than children of normal birth weight. These statistics were the same even when controlled for LBW children with neurological abnormalities (Hack, Klein, and Taylor 183-184). LBW children are also more likely to have behavioral disorders (as measured by teacher and parent ratings) that can persist throughout adolescence and affect their performance in school, and consequently, their futures (Hack, Klein, and Taylor 186-187). These learning handicaps are not necessarily a direct result of LBW but have a much higher incidence in LBW infants and children. The increasing number of LBW infants and the high correlation to these disabilities poses a problem

that will continue to affect and harm future generations of children in America. The consequences of LBW play an immediate and perpetual role in a child's development which ultimately increases their probability of remaining in a lower SES class.

#### IV. Causes

##### *Causes of Low Birth Weight:*

There are both external and internal factors that can increase the risk of a mother having an LBW child; like the causes of a person's SES, the causes of LBW are intertwined and multi-faceted. Congenital birth defects and multiple births aside, one of the best indicators of the fetus' health is its birthweight which is usually a reflection of the mother's lifestyle and overall health. However, there are greater environmental factors that could also increase the likelihood of LBW.

Mother's with health problems like hypertension, cervical or uterine abnormalities, placental problems, diabetes, anemia, infections and problems with the lungs, heart, or kidneys have been associated with LBW (MOD, Reichman 101-102). These health problems can then be coupled with or compounded by poor lifestyle habits like smoking, and alcohol and drug abuse. "Pregnant women who smoke cigarettes are nearly twice as likely to have a low-birthweight baby as women who do not smoke. Smoking slows fetal growth and increases the risk of premature delivery" (MOD). While smoking will result in lower birth weights inevitably causing the consequences discussed earlier, alcohol abuse during pregnancy can result in serious fetal birth defects (Chomitz et al. 124-126). The detrimental effects of fetal alcohol syndrome on the central nervous system has earned heavy alcohol consumption during pregnancy the number one "preventable cause of mental retardation worldwide" (Chomitz et al. 126).

It is not always what the mother puts in her body, but what she does not, that heightens the risk of LBW. Malnutrition and inadequate weight gain are also associated with LBW;

however these factors of the mother's lifestyle can be attributable not only to her personal behavior, but also to her surroundings (Chomitz et al. 123).

A woman's environment during pregnancy, as a result of other external factors can also affect the incidence of LBW. Women exposed to toxins either in the workplace or in the home can have negative consequences on pregnancy; poorer neighborhoods and lower wage jobs are associated with a higher likelihood of toxin exposure (Reichman 103). Being in a lower SES, a pregnant woman is more likely to work and live in lower-standard conditions and is therefore more likely to be exposed to more toxins, leading to negative birth outcomes like LBW, increasing the child's likelihood of remaining in the lower SES of his family. This is just one example of the cyclic relationship between LBW and SES.

Neighborhood socioeconomic characteristics, such as census tract-level income, are important predictors of low birth weight, even after controlling for many individual-level characteristics (Reichman 103).

LBW is clearly caused by a number of factors that cannot be teased from each other despite some seeming to be a problem of self control. A person's environment affects her lifestyle just as her lifestyle affects her environment.

The relationship between lifestyle risk factors and low birth weight is very complex and is affected by psychosocial, socio-economic, and biological factors. While it is important to describe the independent effects of different behavioral and socio-economic risk factors, we must bear in mind that these factors are not isolated events in the women's lives, but are a part of many interrelated complex behaviors and environmental risks (Chomitz et al. 121-122).

As the factors that contribute to risk of LBW are intertwined with all other areas of life, they overlap with factors concerning a child's resilience. This is especially apparent when considering

that LBW decreases resilience; the immediate result of low resilience is infant mortality and the long-term results deal with the child's development as discussed earlier. In order to better fight the consequences of LBW, understanding what contributes to resilience is important.

### Causes of Resilience:

Many of the factors that determine incidence of LBW in a family will also determine the resilience of that family's children. This is because LBW itself is a factor in determining resilience. Therefore, before the baby is born, the mother's environment and individual lifestyle would affect LBW and resilience equally. However, regardless of an infant's birth weight, access to NICU services, nutrition, and protective environmental factors will play a new role in developing resilience.

In the past half century, neonatal intensive care has evolved and spread to treat more patients more effectively. The decline in infant mortality beginning in the 1960s is mostly attributed to better neonatal care (Horbar and Lucey 140). However, this care is not equally administered. The original regional organization of neonatal intensive care still causes geographic discrepancies. But regardless geography, once inside the NICU, infants are discriminated against if they lack health insurance. "Strong evidence indicates that uninsured newborns receive less care than those privately insured or on Medicaid, even when the numbers are adjusted for illness severity" (McCormick and Richardson 167). Lack of health insurance indicates lower SES; children from poorer families are less likely to be treated and therefore less likely to survive or survive without more severe health consequences. Without neonatal care, LBW children are less likely to survive, and more likely to be at risk for chronic illness. Therefore LBW children of low SES are at a distinct disadvantage from their birth. Limited access to neonatal care affects post-natal treatment and inevitably the child's resilience, just as receiving

this care can significantly increase a child's resilience. Specific applications and medical practices are performed differently at different NICUs but when applied appropriately, certain treatments can greatly reduce the instance of RDS and intraventricular hemorrhage, two consequences of LBW (Horbar and Lucey 145-146).

Health insurance is not only an immediate factor in a newborn's life when access to care is determined, but something that will continue to burden the family as the child grows. Neonatal care is very expensive, and not all of it is covered even by private insurance and compensation is usually at a very poor rate (McCormick and Richardson 167).

In addition to neurobehavioral disabilities and poor school performance, children born at very low birth weight who survive are also at higher risk for a broad range of other adverse health outcomes at school age. As a result, survivors of neonatal intensive care have significantly increased medical care costs throughout childhood, which may pose a substantial financial burden to their families (Horbar and Lucey 143).

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However, Medicaid does cover some neonatal care, and programs like Women Infants and Children (WIC), a federal nutrition program targeting low-income families, are efforts to improve birth outcomes.

WIC has helped improve nutrition for both pregnant mothers and newborns in several ways. Multiple studies have confirmed that enrollment in WIC increases birth weight; one such study found eligible participants to have newborns weighing 68 grams more than eligible non-participants (Tanner and Finn-Stevenson 185). Nutrition in newborns is critical for brain development, "even milder under-nutrition can have serious consequences" (Tanner and Finn-Stevenson 186). Increasing nutritional education, and the incidence of breast-feeding, WIC has helped increase the resilience of low SES newborns (USDA).

*Causes As Related to Socioeconomic Status and Race:*

As seen throughout this paper, SES and health, not just LBW, are deeply intertwined. In a recent Scientific American article, “Sick of Poverty”, Robert Sapolsky explains

Poverty and poor health tend to go hand in hand. Poverty means bad or insufficient food, un-healthy living conditions and endless other factors that lead to illness...when you examine socioeconomic status (SES), a composite measure that includes income, occupation, education and housing conditions, it becomes clear that, starting with the wealthiest stratum of society, every step downward in SES correlates with poorer health (Sapolsky 94).

The causes of LBW are intricately linked with low SES just as the consequences of LBW can include factors that will perpetuate low SES. Quantifying the effects of SES on LBW is difficult because evaluating SES is complicated; maternal age, education and marital status have all been used to calculate an individual’s SES (Chomitz et al. 122). It is also hard to ignore the high correlation between certain ethnic groups, SES status and poor health. Conditions established as being clearly related to low SES include overall mortality, infant and maternal mortality, arthritis, heart disease, ulcers, diabetes, hypertension, and chronic bronchitis (Hughes and Simpson 88). Also among these conditions is LBW. “Most, but not all, of [the maternal] medical risk factors [associated with LBW] are more prevalent among blacks than white” (Reichman 101). Figure 6 on the following page is a comparison of LBW incidences among different ethnicities.

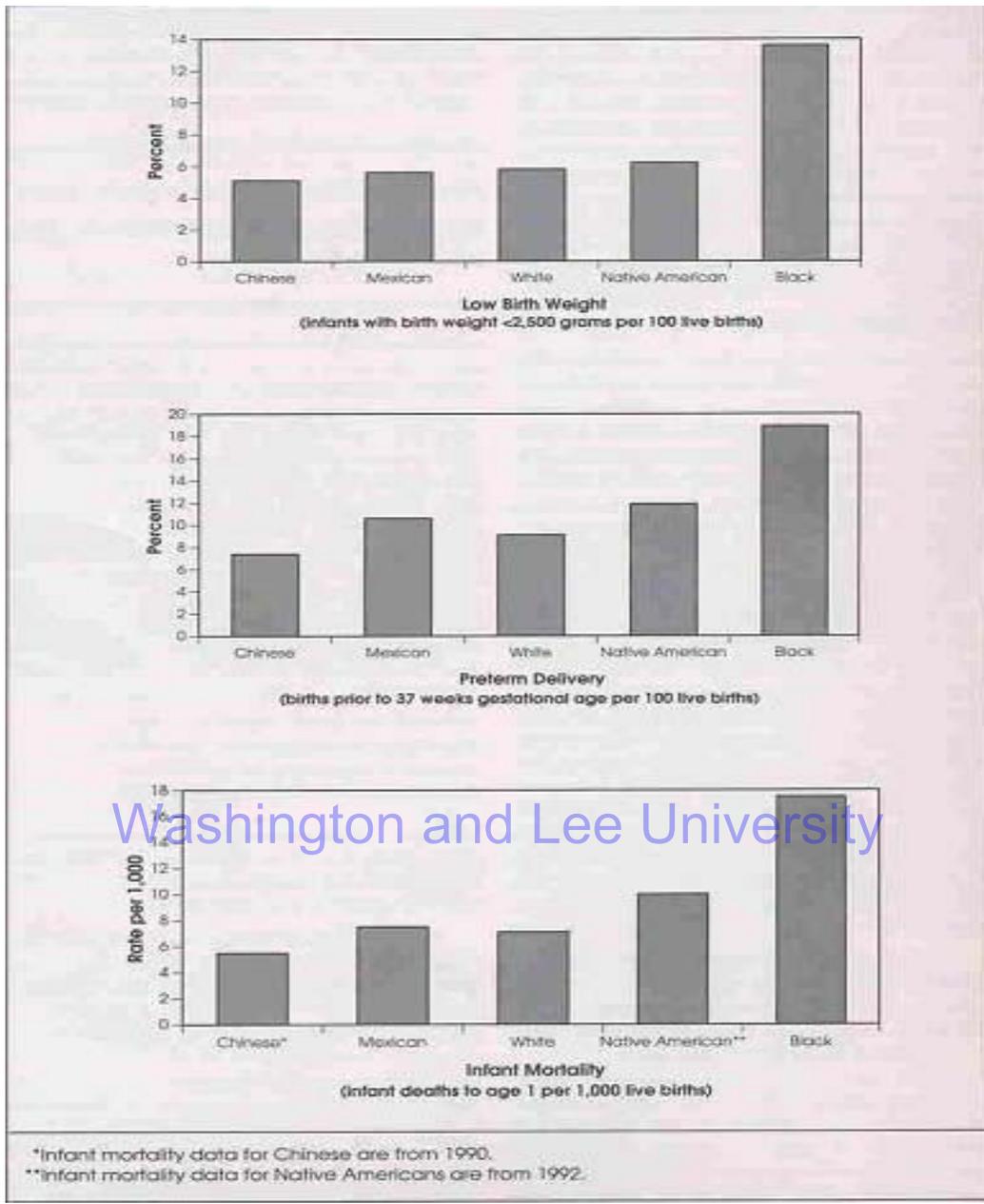


Figure 6. Ethnic Group Comparisons in the United States in 1991 (Paneth 26).

The same study that produced Figure 6 found that in the U.S. the difference in median birth weights between whites and blacks was 250 grams (9 ounces) and that 17% of all births are black babies, but 33% of all LBW births and 38% of all VLBW births are black babies (Paneth 25). The higher incidences of LBW in both low SES and black families are very strong despite the lack of consistent evidence linking all three factors. There are several proposed theories for

the connection between race and LBW as alternatives to low SES. However, because of the deeply established connections between low SES and LBW, the state of poverty in America, and increasing U.S. LBW rates, social policy has made an effort to reach low SES families during pregnancy and infancy in an effort to bring these numbers down.

### V. Proposed Remedies

The problem of LBW is multi-faceted indicating that the effort to reduce it should be also. In order to provide for the needs of all pregnant women and young infants, families must work with physicians and in accordance with effective social policies. The early nineteenth century saw the first steps in government accepting responsibility for the country's health; the federal Children's Bureau was created in 1912, initiating a change maternal and child health care and the 1929 Sheppard Towner Act provided individual care in the form of education, breast-feeding support, and milk stations through public health nurses (Hughes and Simpson 91). We are now at a point in time when these initial policies need to be reformed and reworked to fit our country's evolving needs. As mentioned earlier, WIC effectively increases the health of pregnant women and newborns, but it is only one of a few programs linking SES and birth outcomes. There is an obvious connection between low SES and poor birth outcomes and as the incidence of LBW continues to increase, there is an increasing need for social policy and programs to address this issue.

#### *Early Intervention:*

The Individuals with Disabilities Education Improvement Act (IDEA) was established in 1986 and reauthorized by President Bush in 2004. Part C of IDEA is the Early Intervention Program and Infants and Toddlers with Disabilities (NECTAC). Each state has their own early intervention program designed to enhance individual capacity to intervene in the development of

disabled children and therefore reduce their future costs. However, states are not required to protect ‘at risk’ children (Shackelford 1). Moreover, if they do ‘opt-in’ for at risk children, their various definitions of ‘at risk’ affect the number and type of child being served by these programs. As a result, each state has drastically different programs (exemplifying geographic effects on poverty and health). The National Early Intervention Longitudinal Study (NEILS) is an ongoing study evaluating Part C and its effects on children. Data taken for this study reveals that early intervention, E.I., aid is not targeting families with low income, indicating that ‘at risk’ children are still ‘at risk’ compared to the general population (Shackelford 2-3). Looking at Figure 7 below, income level makes little difference in populations receiving E.I. and the general population.

Characteristic	EI Population, Percent	General Population, Percent <sup>a</sup>
Child's race/ethnicity		
White	53	61**
African-American	21	14**
Hispanic	16	18
Asian or Pacific Islander	4	2
American Indian <sup>b</sup> or Alaska Native	1	1
Mixed race or other	5	4
Mother's education level		
Less than high school degree	16	17
GED or high school degree	32	27**
Some college	28	28
Bachelor's degree or higher	24	27
Household income		
\$15,000 or less	27	21**
\$15,001-\$25,000	16	16
\$25,001-\$50,000	29	31
\$50,001-\$75,000	16	16
Over \$75,000	13	16*

<sup>a</sup> General population data from National Household Education Survey (1999) for children up to 3 years of age.  
<sup>b</sup> In all subsequent analyses, American Indians are included in the mixed race or other category.  
\* = p < .05, \*\* = p < .01

Figure 7. Child's Ethnicity, Mother's Education Level, and Household Income for Families of Children Receiving E.I. Services and for the General Population (Hebbler et al. 2-7).

Furthermore, children receiving early intervention benefits have poorer health than children in the general population (Hebbler et al. 2-10). Clearly new programs need to associate poor health and lack of health care with low income. Low income is a proxy for LBW in that it directly affects nutrition, access to health care, insurance, and other factors which then directly affect newborns, their birthweight, and their chance of survival.

### *Holistic Care:*

New and more policies that specifically target low-income families are needed to counter-act the increased risk of their environment on their health. People who work to implement these policies also need to gain a new perspective on their clients. Physicians need to work not only with their patients, but with their patient's social workers and the staff at the patient's daycare. Communication between the networks of people that provide care for LBW children needs improvement to more efficiently and effectively care for them. PACT is one such place that promotes this type of coordination by having doctors, daycare staff, and social workers all under one roof to help with both the economical and medical issues involved with caring for a LBW infant in a low-income family. This holistic care is the reason behind the success stories at PACT like those of Rene's and LeMarr's.

### *Health Insurance:*

Health insurance is a determining factor not only for care in NICUs, as mentioned earlier, but also for LBW. In a study done on LBW in Pima County, Arizona, Ivy Schwartz of the University of Arizona College of Medicine, found that women without health insurance had significantly higher rates of LBW than women with other forms of insurance (Schwartz 727-728). In her study, Schwartz determined that women without insurance not only had the highest percentage of LBW (7.6%) but that they also had the lowest average number of prenatal visits,

6.9 (Schwartz 727). Prenatal visits proved to be a significant determinant in LBW, 6 or more is determined as adequate care. Out of all women receiving less than this adequate care, 22.7% had LBW infants while these same women only accounted for 11% of the total number of mothers giving birth, indicating an association between decreased prenatal visits and decreased birth weight (Schwartz 726).

Health insurance is a factor for access to both prenatal and postnatal care. Uninsured mothers are clearly at a higher risk of having LBW infants, and these infants are at a higher risk for mortality and other complications which when compounded by their unequal access to NICU services lowers their likelihood of survival. If all mothers and infants were guaranteed health insurance of some kind, infant mortality in the United States would fall because there would not only be an overall lower incidence of LBW, but these LBW infants would receive equal care in NICUs. Health insurance would increase the average number of a woman's prenatal visits and might also encourage other preventative measures to guard against LBW and potential infant mortality.

*Prevention:*

In addition to providing health care access by way of insurance, there are other ways to promote preventative measures of LBW. Prenatal check-ups are only one element in maintaining the health of a pregnant mother. Much can be done before the child is born to lower the risk of LBW by eliminating the preventable causes. Good nutrition, not smoking and not drinking alcohol are only some of the ways a mother can improve her own health and the health of her child before it is born. Programs like WIC could be expanded to include education not only about nutrition but about the risks of certain behaviors. In addition to WIC, more programs could be developed to give comprehensive maternity care beginning with the first trimester and

continuing through the child's infancy. Schwartz suggested case-managed care with the help of neighborhood coordinators so as not to let anyone fall through the cracks (Schwartz 728).

Having a locally-assigned health coordinator could improve the organization and access to health care for mothers and children by acting as a liaison between families and policies. By personalizing social and health care policies, programs like WIC and Early Intervention could be used to their greatest advantage to best care for all mothers and infants.

## VI. Conclusion

The bridge between social policy and medical practice is met within the walls of PACT where doctors and staff do not talk over the heads of concerned parents, but instead include them in their health care. The staff at PACT has a very low turnover rate, allowing them to really form bonds with the parents and doctors of the children in the center. If there were more early intervention programs and medical care programs for at-risk children, including but not exclusive to LBW and low SES children, long term consequences of LBW would decrease. And if more programs like WIC existed to focus on preventative care, trends in LBW and infant mortality would decrease. Decreasing the number of LBW children, the likelihood that kids like LeMarr, Rudy, and Rene would be born healthy, and escape their low SES would increase.

Reducing the United States incidence of LBW with better access to health care and improved programs specifically targeting at-risk children would not only benefit these children and their families, but society as a whole. More children could live productive and happy lives, increasing their resilience and the likelihood of escaping lower socioeconomic brackets. Helping these mothers and infants is positive on all levels; both the medical burden of children's health and the economic burden to families and society would be alleviated.