

Addressing Racial and Ethnic Disparities in Low Birthweight for Connecticut



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Introduction

Despite the fact that Connecticut is among the wealthiest states in the U.S. and fares better overall in terms of perinatal health and birth outcomes compared to the nation, we are far from achieving optimal health status for our residents. *Healthy People 2010* Objectives for low birthweight, very low birthweight, and infant mortality have not been met, and significant health disparities persist for various segments of the population.

Certain racial and ethnic groups experience rates of adverse outcomes disproportionate to others. Even after adjusting for known factors associated with the outcomes, the risks among these groups remain higher. Although a significant amount of research has been conducted on both adverse birth outcomes and health disparities, much remains unknown about the causes of each. The varied and complex relationships between the associated factors – known and unknown - makes it difficult to extract the exact contribution of each factor. Further, the contributions of certain factors are likely dependent on interactions with other factors that may either temper risks or exacerbate the problem. In the absence of definitive answers at present, there is still a great deal that can be done to improve outcomes, further research, better understand the associated factors, and evaluate the efficacy of new and existing interventions.

The Public Health Initiatives Branch Health Disparities Workgroup within the Connecticut Department of Public Health (DPH) convenes staff from across the agency to discuss health disparities within the state, and how the agency can intervene through its programs, collaboration with other State agencies, and partners across the state. The Workgroup identified racial and ethnic disparities in low birthweight as the focus for its first joint project for a number of reasons. First, both the outcome and the disparities have persisted for decades, and progress seems to have plateaued or even worsened for some groups. Second, there are significant risks associated with low birthweight that have considerable emotional, societal, and economic costs. Finally, because LBW is an area that programs throughout the agency already impact, a concentrated focus on the issue could enhance existing programs and stimulate new initiatives. The expectation is that this collaborative effort will build upon past successes and contribute to improved health status for mothers and infants of minority racial and ethnic groups.

Health Disparities

Perhaps more concerning than the stalled improvement in certain perinatal outcomes for the state as a whole are the persistent and marked health disparities that persist for many segments of Connecticut's population. According to The Connecticut Health Disparities Project,

“Health disparities refer to the differences in disease risk, incidence, prevalence, morbidity, and mortality and other adverse conditions, such as unequal access to quality health care, that exist among specific population groups in Connecticut. Population groups may be based on race, ethnicity, age, gender, socioeconomic position, immigrant status, sexual minority status, language, disability, homelessness, and geographic area of residence. Specifically, health disparities refer to those avoidable differences in health that result from cumulative social disadvantages.”¹

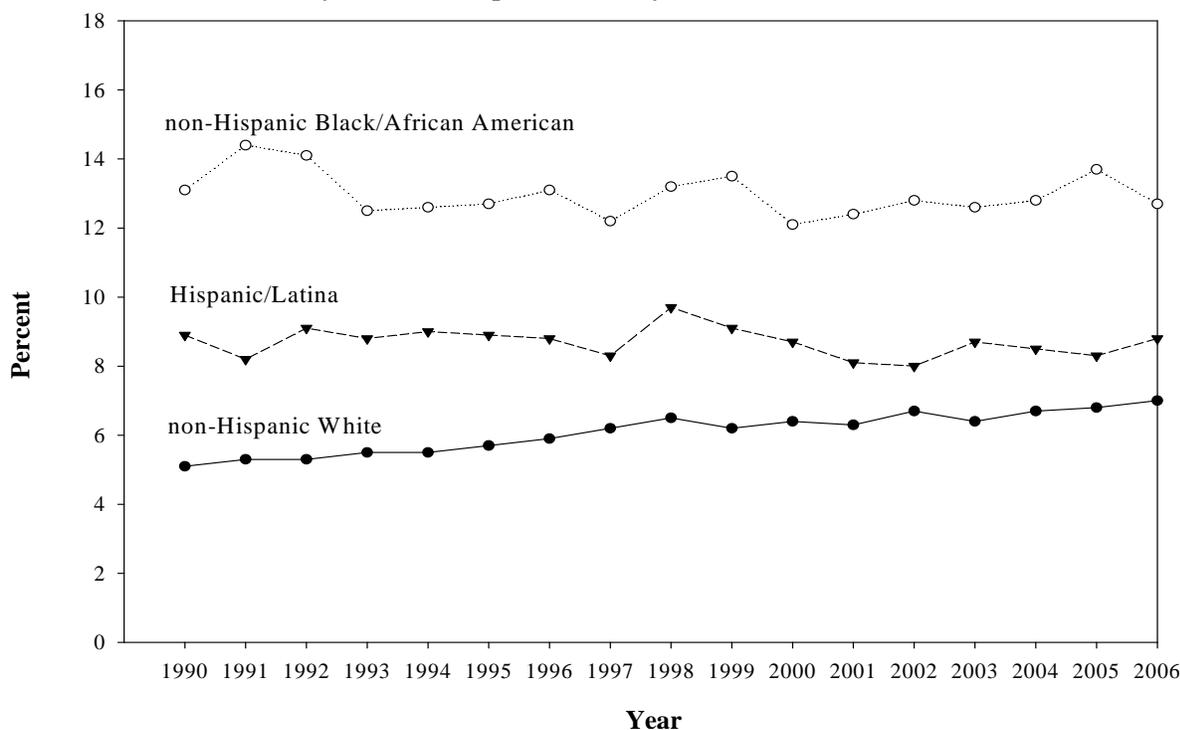
Dr. Vijaya Hogan, Director of the Curriculum on Health Disparities at the University of North Carolina School of Public Health, Department of Maternal and Child Health, discusses the need for a paradigm shift to adequately address perinatal health disparities, and presents barriers that have impeded progress in this pursuit. She asserts, “Factors that cause the disease are not necessarily the same as those that cause the disparity. Efforts to reduce the disparity may require interventions above and beyond those that reduce the disease.”² It is essential to understand that the two problems exist simultaneously, and while they may intersect at some points (e.g., sharing risk or associated factors), the points where they do not must be identified. These areas may require separate and/or complimentary interventions to successfully reduce both the poor outcomes and the disparities. This distinction must remain in the forefront of future research and interventions.

This distinction is also central to the newly released document, *A Strategic Framework for Improving Racial/Ethnic Minority Health and Eliminating Racial/Ethnic Health Disparities*, issued by the U.S. Department of Health and Human Services (HHS) Office of Minority Health (OMH). The OMH developed this framework to “guide, organize and coordinate” its work – and the work of others nationwide – in the systematic planning, implementation and evaluation of initiatives to better ensure success both in improving minority health and reducing health disparities.³ This framework will be discussed later in this report in relation to future projects and collaborations that are needed to continue statewide efforts to reduce racial and ethnic disparities in low birthweight.

Racial and Ethnic Disparities in Low Birthweight

An infant born weighing less than 2,500 g (5 lbs, 8oz) is considered low birthweight (LBW). An infant may have been born LBW either because the infant was born preterm (<37 weeks gestation) or due to growth restriction *in utero* (IUGR) that results in the infant being born at term but small for its gestational age (SGA). Infant death, developmental disabilities, mental retardation, cerebral palsy, hearing and vision impairments, cognitive deficiencies and poor neuropsychological outcomes, learning disabilities and poor educational performance, and behavioral problems are only some of the negative outcomes for which LBW infants are at much greater risk, underscoring the significance of its associated problems.⁴⁻⁷ Further, various subpopulations (e.g., racial and ethnic minorities, teenagers, persons of low income) experience disproportionately high rates of LBW compared to others or to the state overall. As such, the need for continued interventions and research is critical to improving infant birthweight.

Figure 1. Trends in Low Birthweight Births, by Race and Hispanic Ethnicity - Connecticut, 1990-2006



Source: Annual CT Registration Report data, Office of Vital Records, CT DPH

The *Healthy People 2010* objective for LBW is to reduce the proportion of LBW infants to no more than 5.0%.⁷ In 2006, 8.2% of all Connecticut resident births were LBW infants, well above the *Healthy People 2010* target[†]. Between 1990-2006, the rate of LBW rose by 24% (from 6.6%

[†] 2006 Connecticut Registration Report, Office of Vital Records, CT DPH.

to 8.2%)[‡], displaying a steady, upward trend in the statewide rate over this period (**Figure 1**), moving further away from the *Healthy People 2010* target. The rates of LBW in Connecticut mirror the national experience during the same period. The CDC reports that LBW in the U.S. increased 19% since 1990 (from 7.0% to 8.3%). Some increases in the LBW rates may be attributed to increased use of assisted reproductive technology (ART), which is associated with an increased occurrence of multiple gestation pregnancies (i.e., more than one fetus).⁸

The rate of LBW among non-Hispanic Black/African Americans fluctuated over the same period, but has not shown a substantial decline overall (**Figure 1**). On average, the rate of LBW among non-Hispanic Black/African American mothers has declined only about 0.04% per year since 1990. Similarly, the rate of LBW among Hispanic mothers decreased by 0.02% per year, on average. The rate of LBW among non-Hispanic White mothers rose 37% (from 5.1% to 7.0%), displaying a nearly linear upward trend since 1990. On average, the rate of LBW increased by 0.11% per year between 1990-2006.

The disparity between non-Hispanic Black/African Americans and non-Hispanic Whites declined between 1990 and 2006 - with the ratios of their rates falling from 2.6 to 1.8 - yet it remains substantial. Although the gap has closed slightly, it is most likely related to the increase in LBW over time among non-Hispanic Whites rather than any true improvements for non-Hispanic Black/African Americans. The disparity in the rates of LBW between Hispanic and non-Hispanic White women lessened over this time period. The LBW rate ratio of Hispanics to non-Hispanic Whites declined from 1.7 to 1.3 between 1990 and 2006. The increasing rates among non-Hispanic Whites coupled with the small decline in LBW among Hispanics have resulted in this change.

Multiple gestation pregnancies are associated with increased risk of preterm delivery and LBW.⁸ More than half of multiple gestation pregnancies among Connecticut residents in 2006 resulted in infants with LBW[†]. Because of the strong correlation between multiple gestation and low birthweight, these records were excluded from the following analyses to eliminate any bias associated with this relationship. Preterm infants born before 28 weeks gestation were also excluded. These infants tend to have very different risks compared to moderate (28-33 weeks) or late (34-36 weeks) preterm infants, and one would not expect infants at these gestational ages to have achieved sizeable birthweights at their stage of development. **Table 1** displays the

[‡] Annual Connecticut Registration Reports (1990-2006), Office of Vital Records, CT DPH.

[†] 2006 Connecticut Registration Report, Office of Vital Records, CT DPH.

difference in percent LBW when using all birth records compared to that of singletons born 28+ weeks gestation.

Table 1. Percentage and Race/Ethnic Ratios of LBW Among Singleton¹ Resident Births – Connecticut, 2006

Race/Ethnicity	All Births		Singletons ¹	
	% LBW	Ratio	% LBW	Ratio
non-Hispanic White	7.0	ref.	4.6	ref.
non-Hispanic Black/African American	12.7	1.8	9.9	2.3
Hispanic	8.8	1.3	7.2	1.6

Source: J. Morin, from birth records courtesy of L. Mueller and F. Amadeo, HCQSAR, CT DPH

¹ Excludes multiple gestation infants and those born under 28 weeks gestation.

After excluding multiple gestation pregnancies and infants with a gestational age <28 weeks from analyses,[†] the overall rate of LBW in 2006 decreases to 5.9% (data not shown). Although the rates were lower for singletons across each of the race/ethnicity groups, the disparities remain (**Table 1**). Among singletons, the Black/African American-White ratio of LBW is 2.3 and the Hispanic-White ratio is 1.6, both higher than the ratios when all births were considered. The increasing rates among non-Hispanic Whites and for Connecticut overall, combined with only small declines among non-Hispanic Black/African Americans and Hispanics are worrisome. These trends underscore the importance of continued research to examine the determinants of LBW and racial and ethnic disparities, as well as the pursuit of innovative solutions for successful interventions. These data indicate that disparities in LBW persist even among singleton births and that multiple gestation pregnancies mask this disparity.

[†] J. Morin, from birth records courtesy of L. Mueller and F. Amadeo, HCQSAR, CT DPH

Factors Related to Low Birthweight

Decades of research have yielded a great deal of information about risks and protective factors associated with LBW, yet its exact *etiology* remains elusive. Most experts agree that barriers to understanding causality lie within the vast and complex interrelationships between many factors. Fortunately, improvements can be made in the absence of any identified causal factors by minimizing risk factors and maximizing women's health before conception and during pregnancy.

Researchers at Mount Sinai Hospital in Toronto, Canada conducted an extensive search and evaluation of the existing literature on low birthweight, preterm birth, and growth restriction to identify their determinants, and to establish the efficacy of recommended interventions.⁹ This review included critical appraisals of each information source, the quality and merit of study designs, and the strengths of the reported associations. The factors outlined below were identified with proven or possible association with these outcomes.⁹⁻¹⁰

a. Medical/Physical Health

- Previous delivery of a LBW or preterm infant
- Interpregnancy intervals <18 months or >60 months
- Hypertension
- STDs
- HIV infection
- Bacterial vaginosis
- Urinary tract infection
- Nutritional inadequacy and low pre-pregnancy weight
- Teen (<20 years) or advanced maternal (≥ 35 years) age
- Access to quality care
- Multi-fetal pregnancy
- Placental factors
- Inadequate weight gain during pregnancy
- Periodontal infection

b. Lifestyle

Use of the following substances during pregnancy:

- Cigarette smoking
- Heavy alcohol use
- Cocaine use

c. Social Determinants and Mental Health

- Race/ethnicity
- Low socio-economic status
- Low educational attainment
- Unmarried
- First time delivery
- Chronic stress

d. Family History

- Family history of preterm birth or LBW
- Atrial septal birth defect[†]

e. Home and Work Environment

- Passive smoking/environmental exposure to secondhand smoke
- Violence/abuse

[†] C. Liu, CT DPH, personal communication

Risk Factors for LBW with High Racial and Ethnic Disparities in Connecticut

Earlier, rates of LBW were presented that indicated disparities in the rates for non-Hispanic Black/African Americans and, to a lesser extent, Hispanics. Risk factors for LBW vary not only in their prevalence among population groups, but also seem to exert different effects upon them. Identifying these differences are an important component to an improved understanding of why rates of LBW are higher for some groups of women, and also how interventions might need to be targeted differently to successfully reduce adverse outcomes. Below are selected risk factors for LBW for which racial and ethnic disparities exist in Connecticut[†].

Maternal Age

In general, women at both ends of the age spectrum experience less favorable birth outcomes. Age itself is not necessarily a risk factor, but rather women in certain age cohorts constitute risk groups. Compared to other age groups, teenagers (<20 years) and reproductively mature women (35 years and older) have increased rates of certain risk factors that can adversely affect birth outcomes among these cohorts.

Teenagers (<20 years) have not fully matured emotionally and, physiologically, may face some challenges unique to adolescents (e.g., decreased blood supply to the cervix, incomplete development of the uterus, low levels of gonadal hormones).⁹ They are more likely to engage in risky behavior (e.g., tobacco and alcohol use) during pregnancy, their pregnancies are more likely to be unplanned and/or unwanted, more likely to receive late or no prenatal care, and less likely to achieve adequate weight gain during pregnancy compared to adult women (20 years and older).¹¹ Collectively, these risks may act to increase the risk of low birthweight, preterm birth, or other adverse outcomes among this age cohort. In 2006, 14.4% of Connecticut resident births among non-Hispanic Black/African Americans and 15.7% of Hispanics were to teenagers (<20 years), far higher than for non-Hispanic Whites (3.3%). Further, the rates of LBW among non-Hispanic Black (12.3%) and Hispanic (10.8%) teenagers are twice as high (2.2 and 1.9 times higher, respectively) than for non-Hispanic White (5.7%) teenagers. The Centers for Disease Control and Prevention (CDC) notes that teenage mothers are more likely than their peers to live in poverty and less likely to finish high school.¹¹ The consequences of these factors may extend

[†] Unless otherwise noted, data presented are from analyses limited to CT resident singletons births 28+ weeks gestation; J. Morin, from birth records courtesy of L. Mueller and F. Amadeo, HCQSAR, CT DPH

beyond pregnancy and into adulthood, and could contribute to the perpetuation of perinatal and other health disparities.

Among women 35 years and older, part of the elevated rates of LBW may be explained by the use of Assisted Reproductive Technology (ART) and the greater prevalence of pre-existing medical conditions (e.g., hypertension, diabetes) compared to their younger counterparts. Analyses presented in this section help control for some of the effects of ART on rates of LBW since only singleton births were examined. There are apparent disparities in LBW among non-Hispanic Black/African American and Hispanic women delivering at a mature age compared to non-Hispanic White women in the same age group. The increased risk among mature non-Hispanic Black/African American women may be partly attributable to a higher prevalence of co-morbidities (e.g., high blood pressure, heart disease, diabetes, obesity) that are further exacerbated by the demands of pregnancy. One study finding an increased risk of LBW associated with advanced maternal age in African American women also observed that the effect of age was modified by individual poverty.¹² The higher rates of LBW may also be associated with what Geronimus refers to as weathering, "...whereby a woman's health reflects the cumulative impact of her experiences from conception to her current age," which may result in the "early health deterioration" among African American women.¹³ The effects of weathering may be further exacerbated by "internal frustration, anger, or rage at racial injustice."

Late/No Prenatal Care

Early entry into prenatal care (PNC) provides the opportunity to identify problems early, reduce risk factors, and address pregnancy complications if and when they arise. Non-Hispanic Black/African American (25.4%) and Hispanic (24.9%) women were both three times more likely to receive late or no prenatal care in 2006 compared to non-Hispanic Whites (8.6%). Although early entry into prenatal care is important to positive birth outcomes, it may not be enough to fully prevent adverse outcomes for women who are not healthy and/or have one or more behavioral risk factor entering pregnancy. In essence, even early entry into care may be "too late."¹⁴ By the time many women discover that they are pregnant, critical stages of fetal development have passed and opportunities for intervention have been missed. The need to assure optimal health of women of childbearing age is critical to improving birth outcomes.

Preconception care is discussed later in this report as an important component to improving birth outcomes through optimizing a woman's health before she becomes pregnant.

Inadequate Prenatal Care

The adequacy of a woman's PNC utilization is another important factor that impacts birth outcomes. The Adequacy of Prenatal Care Utilization (APNCU) Index (also known as the Kotelchuck Index) is one measure that is widely used to characterize the adequacy of PNC utilization. The APNCU Index considers both the timing of PNC initiation and the number of visits received compared to the utilization schedule recommended by the American College of Obstetricians and Gynecologists (ACOG). In the context of this index, *Inadequate* PNC is defined as receiving less than 50% of the recommended visits. In 2006, non-Hispanic Black/African American (15.1%) and Hispanic (13.8%) women were three times more likely to have received *Inadequate* PNC compared to non-Hispanic Whites (4.8%). The APNCU Index does not measure the *quality of the care received*. Methods to assess the content of PNC care women receive, their attitudes about the care they received, and ways to enhance the PNC experience are discussed in the Recommendations portion of this report.

Marital Status

Unmarried women often have increased rates of adverse outcomes (including LBW), and also have higher rates of poverty compared to women who are married.¹⁵ Although the exact mechanisms by which marital status influences birth outcomes are not known, there are apparent associations reported in the literature.⁹ The disparity in marital status by race/ethnicity in 2006 is striking – non-Hispanic Black/African American and Hispanic women were more than three times as likely to be unmarried (68.7% and 63.3%, respectively) compared to non-Hispanic Whites (20.2%). It is possible that unmarried women may experience reduced social support, lower socioeconomic position and/or the effects of poverty, and behavioral risks that may contribute to the disparities in LBW. The importance of social support networks in promoting health, improved birth outcomes, and addressing disparities in health has been discussed in the literature.^{10, 16-17} Therefore, strengthening and expanding social support networks may help improve birth outcomes regardless of a woman's marital status.

Educational Attainment

Educational attainment is one individual-level measure of socioeconomic position, which is correlated with employment status, occupation and income. Educational attainment is frequently used in research because unlike income, level of education is often available from population-based databases and also remains relatively stable (after young adulthood) over time.¹⁸⁻¹⁹ Further, some researchers have found level of education to have an independent effect on disease risk after controlling for other socioeconomic parameters (e.g., income, occupation, neighborhood income),¹⁹⁻²⁰ and it may be a better predictor of health than income or occupation.²¹ Individuals with less than a high school education face increased challenges in securing desirable employment, particularly jobs with satisfactory salaries and that offer health care coverage. In 2006, there was considerable disparity in the educational attainment by race/ethnicity among Connecticut women giving birth. Non-Hispanic Black/African Americans (18.3%) were more than three times as likely and Hispanic (38.1%) women were seven times as likely to have received <12 years of education compared to non-Hispanic Whites (5.2%). Because low educational attainment is one of the documented risks for low birthweight discussed in the previous section, the disparity in education among women giving birth may be one factor related to the racial/ethnic disparities in LBW.

Health Insurance

Health care coverage is an important factor that enables women to access the health services and counseling necessary for optimizing health. Data from Round 2 of the Connecticut Pregnancy Risk Assessment Tracking System (PRATS) survey[†] indicated that non-Hispanic Black/African Americans (23.7%) and Hispanics (26.0%) were three times less likely to report having *any* source of health insurance just prior to pregnancy compared to non-Hispanic Whites. Of those women with insurance, non-Hispanic Whites (88.1%) were much more likely to have health insurance or HMO coverage to pay for their PNC than non-Hispanic Black/African Americans (53.7%) and Hispanics (46.4%). Non-Hispanic Black/African Americans (43.3%) and Hispanics (38.0%) were much more likely to have Medicaid as a form of payment for PNC compared to non-Hispanic Whites (11.0%).

[†] Family Health Section, CT DPH

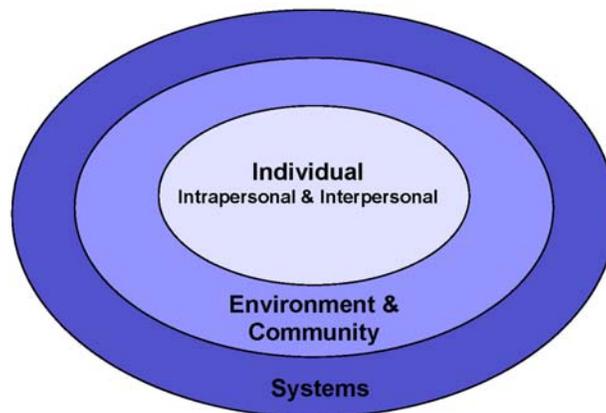
Violence

Whether it be an isolated event or repeated incidents, violence can cause both physical injury and emotional trauma (e.g., fear, stress, anxiety and depression). Ambient violence that various minority populations may experience on a daily basis can be both physical and verbal (e.g., racial slurs, threats, other hateful words). Data on exposure to violence among the MCH population in Connecticut is limited at best, especially in with regard to verbal forms of violence. One measure of exposure to physical violence specific to pregnant women is part of the Connecticut PRATS survey. In 2003, approximately 6.0% of Round 2 respondents reported that they were pushed, hit, slapped, kicked, choked, or physically hurt in some way during the 12 months before getting pregnant. Non-Hispanic Black/African Americans (13.4%) were more likely to report having experienced some form of physical violence in the 12 months prior to getting pregnant compared to Hispanics (7.0%) and non-Hispanic Whites (4.5%). While it is hard to draw conclusions based on these data alone, the survey results suggest that racial and ethnic differences in exposure to physical harm exist. Such exposure can negatively impact a woman's health status entering pregnancy and may pose additional risks during pregnancy.

Factors Related to Racial and Ethnic Disparities

A variety of factors contribute to racial and ethnic disparities in health. These risks are organized, below, into the three categories utilized in the OMH Strategic Framework, which will be used to guide future efforts to address racial and ethnic disparities in LBW. **Figure 2** depicts the nested relationship between intervention strategies among these three levels, as described in the OMH Strategic Framework. The list of strategies presented is not exhaustive, nor are the levels themselves entirely distinct categories since many of the factors are interrelated. However, this information provides a perspective to move forward in addressing racial and ethnic disparities in LBW.

Figure 2.
**Nested Intervention Strategies to
Address Disparities in
Low Birth Weight**



Nested levels of intervention strategies extracted from Office of Minority Health, U.S. Health and Human Services.

Individual-level factors

Individual-level factors encompass both intrapersonal and interpersonal factors, and include knowledge, attitudes and skills, behaviors, and genetic factors.³ Some of the individual-level factors reported in the literature to be associated with health disparities, which may account for differential rates of LBW across race/ethnic groups, include: maternal LBW;²² genetics;^{3, 23} prepregnancy health and behaviors;^{3, 15, 17} attitudes about and perceived barriers to receiving prenatal care;²⁴ lifetime trauma exposure;²⁵ and adequate nutrition.²⁶

Environmental and community-level factors

Environmental and community-level factors are not considered to be within the realm of control for an individual, but rather “provide the context of their lives.”³ These factors are comprised of one’s physical environment, the social and cultural characteristics of a community, and economic, political and institutional conditions. Racial discrimination;^{3, 22, 27} neighborhood poverty;^{22, 28} neighborhood segregation;^{3, 26} social support networks;^{16, 17} transportation issues;^{3, 28} availability and quality of health services;²⁹ feelings of distrust towards providers or the health care system;²⁸ lack of health insurance;³⁰ crime and violence;^{3, 25} and other psychosocial stressors are examples of environmental and community-level factors that must be considered in future initiatives.

System-level factors

System-level factors refer to resources that may or may not be in place to adequately and effectively address the needs or problems in an area (e.g., a community, state, etc.).³ Global systems such as public health and health care must operate so that they are knowledgeable about the problems and needs of the populations they serve, and must ensure that their approaches to these problems and needs are effective. In order to succeed, the resources available to and assets within a given geographic area must be adequate and appropriate to serve the needs of the varied populations that constitute the area. Also required is effective leadership with a commitment to bring about change, develop and enforce policy, and allocate the necessary resources; collaboration with relevant stakeholders; involvement of the communities and consumers; and continued research to further knowledge.

Interaction of Contributing Factors

One major theme throughout the literature is that attempts to reduce racial and ethnic disparities to date have had too narrow a focus (e.g., focusing on a single risk factor or exposure), and that what is needed are integrated approaches to addressing multiple factors – particularly social and broader, system-level factors – simultaneously.^{2, 3, 16, 29} The ecological model shown in **Figure 2** is intended to resolve this issue, since intervention strategies at all levels are considered together.

The factors described above may help explain the persistence of racial and ethnic disparities in LBW. The consideration of risk and protective factors together over time correlates well with the

lifecourse approach to chronic disease epidemiology, which considers exposures at all points in life as having the potential to modify risk for disease.³¹ There are many different models that use this approach as their foundation for explaining health outcomes. The effects of lifetime risks explored in these models suggest that some risks may act independently, or they may depend on interaction with each other. The risks associated with LBW (e.g., developmental disabilities, poor educational achievement, health conditions), the environments one is exposed to across a lifetime (e.g., substandard housing, second-hand smoke, violence, racial and ethnic discrimination, barriers to accessing care), and system-level factors (e.g., inadequate identification problems or needs, ineffective approaches to address problems or needs, inadequate resources allocated to address problems or needs) not only exert their effects on the individual, but subsequent generations as well. The call to consider all relevant factors together has been echoed by countless researchers and professional organizations, including the OMH. The DPH is answering this call through its current programs and future initiatives.

Recommendations for Eliminating Racial and Ethnic Disparities in Low Birthweight for Connecticut

Healthy People 2010 set the elimination of racial/ethnic disparities as an overarching goal for all areas of health. With the year 2010 fast approaching, we find ourselves far from achieving this goal. As many experts have pointed out, the failure to address more global issues such as discrimination and poverty, which disproportionately affect racial and ethnic minorities, and the tendency to focus interventions on single factors and failure to take into consideration the complex relationship between risks, has significantly impeded progress.

The good news is that we are at an exciting crossroads, where these considerations have come to light, a specific framework for efforts to continue has been established (i.e., the OMH framework), and research on the etiology of LBW itself continues. This is a time of great opportunity to change our thinking and approaches, and to work collaboratively to address the many facets of this problem in the integrated approach success dictates.

Below are recommendations for starting down this path. These recommendations incorporate information from two recent plans for addressing LBW in Connecticut,^{10, 32} as well as the OMH's Strategic Framework³. Specific plans for operationalizing each of these recommendations will require the development of implementation plans; collaborations with other state agencies and partners; interventions that are culturally competent; and multi-level (i.e., individual, environmental/community, and system-level) approaches to be successful. Across all levels, the expansion of cultural competency training for staff serving the MCH population across the lifespan is essential. Strong evaluation components also must be developed for all programs and interventions so that their efficacy can be appraised. Implementing these recommendations will move us in the direction of *reducing* disparities so that we may ultimately enjoy their *elimination*.

I. Recommendations to Address Individual-Level Factors

80 **Pursue ways to increase the receipt of Preconception Care for all women of childbearing age (15-44 years).** About half of all U.S. pregnancies are not planned.³³ By the time many women discover that they are pregnant, critical stages of fetal development have passed and opportunities for intervention have been missed. The need for women of childbearing age to achieve optimal health is essential for favorable birth outcomes. PCC is specifically intended to reduce or eliminate risks among women of childbearing age and to optimize their health *prior* to conception. The March of Dimes, American Academy of Pediatrics (AAP), and American College of Obstetricians and Gynecologists (ACOG) endorse PCC as a means to improve pregnancy outcomes. The core components to PCC are outlined below, with some examples of the types of care provided.³⁴

Maternal Assessment: general physical exam; lifestyle and behaviors; family history; and obstetric history including experiences during/outcomes of these pregnancies (e.g., problems during pregnancy, prior preterm birth or LBW, infant death, etc.).

Screening: identify and/or address health conditions that can cause problems during pregnancy (e.g., Diabetes, high blood pressure, anemia, thyroid problems, STDs); genetic disorders; depression or other mental health concerns; domestic and intimate partner violence.

Counseling: smoking, alcohol consumption, and illicit drug use; mental health; weight management; promote optimal birth spacing and pregnancy intendedness; and nutrition counseling including folic acid consumption.

Vaccinations: vaccine-preventable diseases or infections that could negatively affect the mother and fetus include rubella, hepatitis B, varicella, and influenza.

The DPH Family Health Section (FHS) has been working with the Hartford Health and Human Services (HHS) Department's Maternal and Child Health Unit to complete a preconception health plan for the City of Hartford. The FHS will continue to collaborate with the Hartford HHS Department as they move into the implementation phase. Evaluation of Hartford's initiative can be used to expand and inform efforts around PCC in Connecticut. Identifying and addressing barriers to accessing care and the utilization of PCC services – particularly for women from racial/ethnic minority groups - are essential components to this recommendation.

∞ **Promote the use of the CenteringPregnancy® model of prenatal care.**

CenteringPregnancy is a group prenatal care model that has shown to reduce adverse birth outcomes.¹⁰ This model – endorsed by the March of Dimes - provides social support, counseling, and education on a monthly basis to small groups (approximately 10-15 women). CenteringPregnancy also has high patient satisfaction ratings and does not impose additional costs to the clinic running the sessions. Part of the success of this intervention is the strong social support participants give to one another, an element that may be missing among women at high-risk for adverse outcomes such as LBW. The Family Health Section has included CenteringPregnancy in its Strategic Plan to address low birthweight in Connecticut.

∞ **Expand tobacco use cessation programs targeted to pregnant women.** The DPH Tobacco Program was recently awarded funding to implement a cessation program specifically addressing pregnant women. This program will be implemented at six community-based health centers in Connecticut. The opportunity to reduce LBW, as well as associated infant mortality attributable to maternal smoking exists with this new initiative. An independent evaluator has also been hired to build a strong evaluation component to assess the program's efficacy both in reducing LBW and improving birth outcomes while addressing racial/ethnic disparities (B. Walsh, personal communication). The intervention will incorporate knowledge about smoking attitudes and choices among different racial/ethnic groups in the areas where the program will be implemented. The future expansion of efforts to all pregnant women would include the integration of smoking cessation education and referrals into all health care encounters. Other considerations include ways to alleviate financial barriers to the availability and/or receipt of interventions (e.g., supplemental reimbursement to providers, free/affordable cognitive and/or pharmacological therapy to women), and culturally appropriate and diverse public awareness campaigns.

II. Recommendations to Address Environmental- and Community-Level Factors

- ∞ **Develop and implement measures for addressing psychosocial factors in women’s lives,** in particular: stress associated with discrimination and institutional racism; social relationships; economics; and safety (crime and violence) in women’s lives. African American mothers living in more segregated areas have a higher risk of delivering LBW infant than those in less segregated areas.³⁶ Environmental exposures may partly contribute to this (e.g., toxic exposures, substandard housing, increased risk of infection, reduced availability of high quality medical care, lower food quality and higher grocery prices). Also, the psychological stress associated with this segregation may also be a contributing factor. The DPH and its partners must develop and effectively implement measures for addressing psychosocial factors in women’s lives. One approach the FHS is currently taking is the development of a Sexual Violence Prevention Plan for Connecticut, which will incorporate these factors.

- ∞ **Maximize co-enrollment in WIC and Medicaid for all eligible women.** Seek ways to increase **WIC** enrollment and co-enrollment with Medicaid among *all* eligible women. A special study of WIC enrollment and birth outcomes in Connecticut (2000) revealed that enrollment in WIC at least 12 weeks prior to delivery was associated with reduced risk of delivering a LBW infant; this finding is consistent with results reported in the literature.³⁵ Further, WIC enrollment at least 12 weeks prior to delivery “significantly reduced risk of LBW...among women co-enrolled in HUSKY A, and among both non-Hispanic Black/African American and Hispanic women.” In order to maximize co-enrollment in these programs, there will need to be increased collaboration between the DPH and the Connecticut Department of Social Services (DSS) to promote co-enrollment and make the process as simple and coordinated as possible for women. This may include providing additional resources to women and increasing funding to these programs to facilitate the process. Barriers to co-enrollment for eligible women also must be identified and addressed. Media efforts to let women know they can qualify for both programs and the benefits of co-enrollment may also be an effective strategy.

- ⌘ **Assure the quality of and access to health care services before, during, and after pregnancy.** Although programs exist to provide coverage and care to women *during* pregnancy, many uninsured or underinsured women do not have access to quality and/or continuous preconception or postpartum health care. Women of childbearing age must have *continuous* health coverage in order to optimize their health and to identify and address problems early so they may enter their current and/or subsequent pregnancy healthy.^{10, 26, 32} Limited fiscal resources currently impose challenges to expanding coverage to additional women. While discussions and efforts must continue to work toward this end, there are opportunities to increase the availability of services, particularly to high-risk groups of women. Beyond merely providing coverage, it is also crucial to ensure that women are able to access care and that the care they receive is of high quality. Gathering consumer feedback to identify and address barriers and concerns is an important component to implementing this recommendation.

- ⌘ **Engage and partner with medical providers.** Medical professionals have demanding jobs. While they cannot be all things to all people, there are important enhancements to the provision of care that they *can* make that could be effective in reducing health disparities. The training and education provided in medical school is almost exclusively based on the physical self, but offers little or no training with regard to the emotional or social inputs to health. However, this deficiency in training is not an excuse to overlook or ignore these needs. Hogan et al. state it best,

“Health care providers are not exempt from addressing social causes because it seems too difficult or because it is not perceived within their realm of influence. Quality of care has social correlates, and it is incumbent upon health care providers to understand the social factors that influence their patient’s lives, particularly when most of their “care plans” are carried out in the home or in the community, not in the clinical setting.”²⁹

However, it is also incumbent upon the public health community – recognizing this problem – to engage the medical community in the state. Efforts could begin with meetings with professional organizations such as the Connecticut Section of ACOG and the Connecticut Chapter of AAP to build support and work collectively on initiatives. This may include

offering provider education about how to integrate enhanced care into their practices and making resources available to them.

- ∞ **Increase activities around male involvement.** The FHS recognizes that the health of fathers and men impacts the health and well-being of women, children and families. The social support men can provide is one essential element missing for many women with adverse birth outcomes. As such, the FHS promotes the inclusion of men in programs serving the Connecticut MCH population. FHS staff are active participants on many different workgroups, including the New Haven Family Alliance-Male Involvement Network, the Statewide Fatherhood Initiative Council (DSS), and the Adolescent Paternity Workgroup that is comprised of members from DSS, DCF (Department of Children and Families), DOC (Department of Corrections), and community based organizations. Collaborations with these workgroups and their constituent agencies can be expanded to increase male involvement in women's health before, during, and after pregnancy.

As part of the Hartford HHS Department's preconception health plan – developed in partnership with the FHS – is a recommendation to develop and implement a curriculum that focuses on how to integrate or enhance the role of men in supporting women during the perinatal period, including communication with the mother; strategies to reduce stressors in the relationship; the impact of nutrition and lifestyle; and the impact on future or existing pregnancies. The proposed curriculum will also include the role of teen fathers. The FHS has initiated work to develop this curriculum in consultation with a subject matter expert. This curriculum initially will be shared with the Hartford HHS Department for their MCH programs; the Department of Social Services for use with their Fatherhood Initiative; and State Healthy Start Programs and other agencies/organizations that serve the MCH population (e.g., The New Haven Family Alliance - Male Involvement Network).

III. Recommendations to Address System-Level Factors

∞ Conduct ongoing research to investigate factors associated with LBW and disparities in LBW:

Identify funding to implement an ongoing PRAMS-like survey. The DPH Family Health Section is preparing to conduct its third Pregnancy Risk Assessment Tracking System (PRATS) survey, which examines maternal attitudes, behaviors and experiences throughout the perinatal period to investigate risk and protective factors and their associations with birth outcomes and maternal and infant health. The PRATS survey is modeled after the Centers for Disease Control and Prevention’s (CDC) larger-scale Pregnancy Risk Assessment Monitoring System (PRAMS) survey. Currently, the CDC is able to fund 37 states in the U.S. to conduct this surveillance work. Because Connecticut currently does not receive PRAMS funding, the ability to perform continuous surveillance is a hindrance. If the PRATS survey were continuously funded, it would provide the opportunity to gather important surveillance data that previously has not been measured. The PRATS survey is currently funded through monies provided by the State Systems Development Initiative (SSDI) grant through the U.S. Health Resources and Services Administration (HRSA). New questions added to the third survey include the topics of discrimination in health care, domestic violence, perinatal depression, and PCC.

Investigate the role of racial and ethnic discrimination as it relates to both acute and chronic stress in the lives of women, and how it impacts the health care they seek and receive including quality of care; comfort with providers; adherence to medical advice; and influence on their care-seeking behaviors. The FHS has submitted a research proposal in response to a federal funding opportunity to investigate the effect of racial and ethnic discrimination during prenatal care. If funded, this research will allow for a mixed model approach to measure perceived discrimination in prenatal care among women of racial and ethnic minority groups. The degree to which perceived discrimination adversely impacts the health outcomes of the study population will also be addressed. One component to the quantitative piece of the research will be the inclusion of a set of questions on the upcoming PRATS survey specific to this topic.

Conduct intragroup studies to better understand racial and ethnic disparities in health outcomes. Hogan and her colleagues researching perinatal health disparities suggest *intragroup* studies as a way to better understand the differences in outcomes within a specific racial or ethnic group, which may also help identify culturally

appropriate prevention strategies.²⁹ They make an important point that most likely has been overlooked in previous research and interventions, stating “comparing across populations – with the implicit assumption that populations represent homogenous units – without the prerequisite understanding of the variability within populations has been a hindrance in understanding racial/ethnic disparities in health outcomes.” The DPH should explore ways in which to conduct such studies as part of its work in addressing health disparities in LBW.

∞ **Foster greater collaboration between State agencies, with a commitment to reduce health disparities in LBW in Connecticut and work collaboratively across programs.**

Commitment and leverage at the highest level is needed to ensure interagency collaboration and the allocation of adequate resources to address identified problems and needs. This does not necessarily require new groups to form. Rather, an appropriate, existing statewide workgroup can be identified and charged with the responsibility of convening representatives from agencies across the state (e.g., Social Services, Mental Health and Addiction Services, Public Safety, Education, Labor, Corrections, etc.) and ensuring that efforts to reduce racial/ethnic disparities in LBW are integrated into the work they do. This recommendation may be appropriate to implement under the leadership of the Governor’s Early Childhood Cabinet. Theoretically, the many facets of life touched by the individual agencies that serve Connecticut residents may collectively foster the needed changes and improvements in health status.

Conclusion

Maternal and child health professionals, medical providers, and researchers have studied perinatal disparities for decades. Although significant progress has been made in measuring and documenting associated factors, we are far from determining the exact cause(s) for both LBW and the disparities among certain racial/ethnic groups. New research has suggested factors inhibiting progress, which provides new opportunities for the future. These opportunities exist within the recommendations presented in this report. These recommendations represent a starting point from which the DPH and its partners must move forward, which will require strategies and actions plans to be developed. If successful in implementing multi-level strategies for these recommendations, Connecticut may finally realize progress in the direction of eliminating disparities in LBW. Further, because the factors associated with both LBW and other adverse outcomes such as preterm birth and infant mortality are strongly correlated with one another, it is anticipated that strategies to address disparities in LBW could also simultaneously improve these other outcomes.

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