The Prevention of Low Birth Weight Births in Washington, DC: A Health Communications Perspective

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Executive Summary

Over the past two decades, the incidence of LBW across the US has been increasing and DC rates have continuously been among the highest.[i] As of 2006, the national average for LBW is 8.3% while DC's overall rate is 11.6%.[ii] In total, 986 of the 8,522 births in DC in 2006 were LBW births.[iii]

LBW infants are 20 times more likely to die during infancy and have a higher incidence of learning disabilities, mental retardation, blindness, cerebral palsy, deafness as well as diabetes II, and cardiovascular disease to name a few of the common LBW complications.[iv] Medical technologies today enable babies of lower and lower birth weights to survive at the cost of their mental and physical short and long-term health. The social and economic costs of these problems bring to light the fact that policy must address the underlying causes of LBW thereby preventing LBW instead of simply treating LBW.

A health communications approach to LBW will provide a low cost, preventative strategy to lower the high rate of infant mortality in DC as well as reduce the public health concerns associated with LBW. The health communications program proposed in this paper focuses on behavior modification through the use of interpersonal and group level communication as well as media advertisements. The target audience is African American, single, women of childbearing age residing in Ward 5, 7 and 8 in Washington DC. The program seeks to promote smoking cessation, proper nutrition and stress management during pregnancy. While formative research is necessary, the hypothesized appropriate methods of communication are interpersonal communication workshops, written pamphlets and a metrobus / free newspaper advertising campaign. Program monitoring and evaluation will include reach and message assessment as well as an end evaluation of LBW at the end of the 3-5 year program timeframe.

Problem Statement and Introduction:

Over the past two decades, the incidence of LBW across the US has been increasing and DC rates have continuously been among the highest.[v] As of 2006, the national average for LBW is 8.3% while DC's overall rate of 11.6% is second only to Mississippi's rate of 12.4%.[vi] In total, 986 of the 8,522 births in DC in 2006 were LBW births.[vii] LBW infants are 20 times more likely to die during infancy and are at high risk for long-term health and developmental complications.[viii] Infant mortality is therefore closely associated with LBW. The infant mortality rate of the District of Colombia is 11.3%; almost double the national average of 6.5%. Out of 8,522 births in 2006, 96 died. Low birth weight (LBW) is associated with 83.3%, or 80 of those 96 deaths. [ix]

LBW babies suffer from short and long term medical complications and physical and cognitive developmental delays. The economic impact from immediate care of the LBW infant, as well as the long-term care of the LBW child and adult, brings societal consequences when the incidence of LBW is significant in a given community. The impact of LBW on an individual and societal level necessitates intervention in the issue.

Initiatives targeted to decrease LBW should focus on prevention. Despite the increase in LBW, total rates for infant mortality have decreased over the past ten years both nationwide and within DC. Although this may seem paradoxical because of the strong positive correlation between LBW and infant mortality, the data is explained by improvements in medical technology that are increasing the survival rate of LBW babies. Significant technological and financial investments have been dedicated to the treatment of LBW; however these babies will suffer more severe complications the less they weigh at birth. Policy must therefore address the causes of LBW and strive to prevent, not just treat, LBW infants.[x]

Health communications uses communication strategies to influence decisions that impact health on individual and community levels.[xi] A health communications approach to LBW will provide a unique strategy to lower the high rate of infant mortality seen in the District of Colombia as well as improve overall public health by reducing the health complications associated with LBW. Such an approach is a low cost alternative to clinically based methods and also seeks to address underlying causes of LBW thereby preventing LBW instead of simply treating LBW.

Program Strategy

This health communications program will focus on behavior modification through the use of interpersonal and group level communication as well as media advertisements. The target audience for the purpose of this program is African American, single women of childbearing age in Wards 5, 7 and 8 of Washington, DC. The program will seek to modify the following three behaviors that have all been identified as underlying causes of LBW: smoking cessation, healthy nutrition and weight gain, and stress management during pregnancy. A 3-5 year time frame should provide enough time for the health communications campaign to be incorporated into and make an impact within existing initiatives to combat infant mortality and LBW. 3-5 years will allow for sufficient time to monitor program reach and efficiency as well as make necessary adjustment before evaluating the overall program impact through assessing LBW rates.

Formative research is needed to evaluate the most effective communication channel as well as the motivational factors behind the target behaviors for the given target audience. Focus groups and random sample surveying conducted within the target audience would be key aspects of formative research. To identify the most appropriate channel of communication, the research must ask how the target audience obtains information, what sources of information the target

audience finds trustworthy, how information is spread amongst the target audience and to which modes of communication/advertising is the target audience most exposed. For the purposes of this program strategy, the hypothesis is that the target audience will respond most favorably to the three following methods of communication.

The first method is interpersonal communication in the form of informational sessions and workshops. These group communication sessions will be conducted at local community centers and health centers, particularly those with a maternal and child focus. The sessions will disseminate information, provide referrals for further assistance, and promote communication and networking amongst women in similar situations as well as between patients and healthcare providers. Food and nutritional supplements will be provided as a means of aiding in pregnancy health as well as providing attendance incentive. The DC Birth Center (DCBC) has had great success in reducing preterm and LBW within their patient population through an overarching strategy of increased interpersonal communication between patients and healthcare providers. The midwife approach of the clinic lends itself to high levels of interpersonal communication and encourages women to learn from and support each other during and after pregnancy. These workshops and informational sessions seek to reproduce some of the success obtained by the DCBC beyond the patient population of the clinic.

The second hypothesized method of communication is written literature in the form of pamphlets. One pamphlet will contain information on the causes and consequences of LBW while others will focus on each of the identified behaviors in turn and offer guidance for smoking cessation, proper nutrition and stress management during pregnancy. All pamphlets will contain referral information for prenatal care such as the DC Birth Center as well as specific program for nutrition (WIC), smoking cessation and stress management. Although the target population may

not seek out health literature, these pamphlets will provide health care workers will a useful tool. The pamphlets may serve as written, take home summaries of the communication conducted between a patient and healthcare provider and may provide a necessary reminder or guide after the prenatal visit has ended.

The third method of hypothesized effective communication is a DC Metrorail/MetroBus and free newspaper advertising campaign. Advertisements will serve to create awareness of the importance of smoking cessation, proper nutrition and stress management during pregnancy. These advertisements will be placed in all avenues of Metro advertising including buses, trains, stations and bus stops as well as within loca, free newspapers such as *The Express* and *The Inquirer*. The populations of Ward 5, 7 and 8 are generally lower income individuals who are more likely to use the metro for transportation than a personal car. Even for those individuals who are walking, the metrobus stops will also show advertisements addressing the targeted behaviors.

All three channels of communication must convey a message directed at the motivating factors associated to each behavior for the given target population. Formative research is necessary in addressing questions such as why women smoke during pregnancy, why women who try to quit smoking are unsuccessful, why women do not maintain adequate nutrition and gain required weight, how women eat and exercise during pregnancy, as well as how women do or do not deal with social and economic stress during pregnancy. These types of questions must be answered in order to ensure the effectiveness of the messages presented through informational sessions, pamphlets and metro advertisements.

Behavioral causes of Low Birth Weight

A LBW infant, as defined by the WHO, is an infant weighing less than 5 pounds and 8 ounces, or 2,500 grams, at birth. LBW is directly caused by preterm delivery or intrauterine growth restriction. There are also many indirect causes for LBW including maternal smoking during pregnancy, poor maternal nutrition and overall health, maternal infections, social and or economic stress, exposure to environmental hazards such as air pollution, poor pregnancy spacing and a previous LBW birth.[xii] The indirect causes of LBW are vast, somewhat unexplained by the scientific community, and largely complex to address. A health communications campaign, however, could target risks associated with smoking, nutrition and stress during pregnancy as a way to combat LBW.

Smoking during pregnancy is the number one behavioral risk factor for LBW. Even when other factors are controlled, pregnant smokers are reported to be 50% more likely to deliver a LBW than their non-smoking counterparts. Research has also shown that each cigarette smoked during pregnancy lowers the birth weight of the baby with an average of 150 – 320gram reduction. 20% of all low birth weight births could be prevented if no pregnant woman smoked cigarettes. Passive smoking, or exposure to second hand smoke also increases risk for LBW.[xiii] DC mirrors nationwide statistics in that cigarette smoking increases as education and income levels of a given population decrease. Wards 7 and 8 have the highest rates of smokers at 24% and 37% respectively.[xiv]

New research from Danish scientists explains the LBW and smoking connection from a biochemical perspective. Smoking lowers the production level of the enzyme endothelial nitric oxide synthase (eNOS), which regulates blood vessel dilation. With fewer eNOS enzymes, blood vessels narrow and restrict the blood flow to the fetus resulting in lower birth weight.

When women quit smoking early in the pregnancy, however, eNOS levels can return to normal and avoid an impact on the baby's birth weight.[xv] Any reduction in smoking for any length of time can significantly aid in fetal development. Even limited success in behavior change programs targeted at smoking cessation during pregnancy helps to decrease the impact of LBW.[xvi]

The nutrition of the mother and her weight gain during pregnancy greatly impact fetal development. Women should gain between 25-30lbs during their entire pregnancy and research has shown that women with total weight gains of 22 pounds or less are two to three times more likely to have growth-retarded babies at full-term. Teenage mothers, single mothers, low-income mothers and African-American mothers are all at risk for low pregnancy weight gain. Although there is not a lot of research on the connection between specific nutrients and LBW outcomes, increased intake of protein, iron, folate and the B vitamins are essential for the growing health needs of both the mother and the fetus.[xvii] Income and health education are essential for good nutrition pre and during pregnancy. A health communications campaign can help increase awareness of nutritional needs during pregnancy as well as

Although health professionals generally agree that stress plays a role in LBW, scientific studies have a hard time quantifying the link because of the multivariate nature of stress. Stress may impact maternal and infant health directly through physiological factors (changes in neuroendocrine functioning and immune system responses) as well as indirectly in terms of health behaviors. Stress is also linked with anxiety and depression, which have been suggested as factors for preterm birth and lower gestational weight gain.[xviii] Women who are unmarried while pregnant are often dealing with an unexpected pregnancy and have less economic and social support without a spouse. Low-income women are also at risk as they may be dealing

with the stresses of food insecurity, unemployment, or unskilled and labor intensive work. Health communications can help promote stress management tools and resources during pregnancy that are connected to LBW.

Consequences of Low Birth Weight

LBW can cause immediate and long-term complications for not only the individual baby but when LBW rates in a given population are high, also for entire communities. The baby's physical and cognitive development is impaired right away from LBW. Medical and social complications as a result of LBW can vary greatly depending on the actual birth weight as lower birth weights yield correspondingly more serious problems. Not only are LBW babies at significant risk for mortality because of issues like intraventricular hemorrhaging in the brain, respiratory distress syndrome (RDS) that creates a lack of oxygen, and Patent ductus arteriosus (PDA) that causes cardiac complications and can result in heart failure, but these babies also face long term health complications. Blindness, cerebral palsy, deafness and mental retardation are common results of LBW.[xix] Chronic respiratory diseases like childhood asthma have also been associated with LBW.[xx] Medical issues resulting from a LBW can follow an individual into adulthood as complications such as type 2 diabetes, hypertension, cardiovascular disease are also connected to LBW and fetal development.[xxi]

LBW also as the ability to become a cyclical issue in that female LBW babies are at risk for delivering LBW babies when they become mothers. Being born with a LBW not only creates long term medical and social issues which can result in economic risk factors for LBW but there is also an associated biological cyclical risk.

In terms of cognitive development, LBW greatly impacts intersensory development thereby causing intellectual impairment and oftentimes learning disabilities. LBW children

consistently score lower on motor skill assessments, and demonstrate lower academic performance. This impaired cognitive development can cause long-term productivity implications for a society when enough of the population has been affected by LBW.[xxii]

The Economic Cost of Low Birth Weight Babies

In a nationwide study of the births from 2001, it was estimated that $5.8 billion was spent on LBW infant hospitalizations.[xxiii] The DC Birth Center in 2005 saved the DC public healthcare system $1,150,000 in the prevention of pretem/LBW births. In 2005 the operating budget for the DC Birth Center was $1,073,000, clearly demonstrating that preventive care, especially that based on relational healthcare like the DC Birth Center is clearly cost effective.[xxiv]

In addition to neonatal care, the long-term costs of LBW must also be taken into consideration. A study looking at data from 1989-1990 determined that LBW births add an additional $370.8 million cost to special education every year in the US.[xxv] This number has surely risen in the last decade due to the increased survival of lower and lower birth weights that sustain even greater cognitive development complications. There are also substantial costs due to the long-term medical complications associated with LBW. For example healthcare costs for diabetes type II and hypertension, in addition to the many other adult medical conditions linked to LBW, significantly add to the economic burden of LBW.

Target Audience:

This health communications initiative primarily targets unwed, African American women of childbearing age living in Wards 5, 7 and 8 of the District of Colombia. These women are typically of a low-income socioeconomic status and are not educated beyond high school.

The female, childbearing populations of Wards 5, 7 and 8 will be targeted through this initiative because these populations are most affected by LBW. Wards 5, 7 and 8 have the

highest rates of LBW within the district. Ward 8 has the highest incidence of LBW at 14.7%, or 184 LBW births in 2006. Ward 5 is the second highest with 128 LBW births, or 14.3%. Ward 7, with 129 LBW births, has a rate of 12.7%. Corresponding to their respective LBW rates, Wards 8, 5 and 7 also have the highest rates of infant mortality in descending order. LBW rates also correlate with socioeconomic status. The populations of Wards 5, 7 and 8 have the lowest levels of education and incomes of the District. For example, 65% of the population in Ward 8 has no education beyond high school and only 12% have college diplomas.

As socioeconomic status often falls along racial lines, Wards 5, 7 and 8 have higher proportions of African-American populations at 78.4%, 90.8%, and 93% respectively.[xxvi] Across the US, statistics show that African American babies are twice as likely to be born low birth weight, to be born preterm, and to die at birth than white babies. Out of the 986 LBW births in 2006, 706 were born to African American mothers, 168 were born to European American mothers and 15 were born to Asian or Pacific Islander mothers. This data as reported by the State Center for Health Statistics for DC includes mothers of Hispanic descent within the Black and White mother categories. A separate presentation of the data shows that 7.9% of the births to Hispanic mothers were of LBW and that 7.3% of the births to White mothers were of LBW. The percentage almost doubles however for African American mothers in that 14.6% of their respective births were of LBW.[xxvii] The association between race and LBW is complex and not well understood. Regardless of the explanation as to why, the fact remains that the African American population is more susceptible to LBW and therefore will be primarily targeted through this health communications campaign.

Single mothers are also at an increased risk for delivering LBW babies. In general, single mothers have less social and economic support and face higher stress due to unexpected

pregnancies. Although DC has not published official data documenting the correlation between unwed mothers and the incidence of LBW, the connection is well established in studies and academic literature around country so it is safe to assume that the connections also exists in DC. Additionally, there is data from DC that suggests infant mortality is associated with marital status. In 2006, 77 of the 96 infant deaths, or 80.2%, were delivered by single mothers. Data from North Carolina demonstrates that unmarried women at twice as likely as married women to deliver a LBW baby.[xxviii] The Annie E. Casey Foundation,

Women under the age of 20 and over the age of 45 are also more likely to give birth to a LBW infant. Teenagers are less likely to gain sufficient weight during pregnancy, more likely to be iron deficient and more susceptible to preterm delivery. In 2006 in DC, 12.3% of the births delivered by women under the age of 20 were LBW babies and of the 986 total LBW births in DC, 126 (12.8%) were born to the same teenage demographic. 885 of the LBW babies were born to women over the age of 20 and 5 LBW babies were born to women of an unknown age. Although teenage mothers are at overall risk for delivering a LBW infant, the majority of births to teenagers in DC are not LBW and furthermore the majority of LBW babies in DC are not born to teenagers. This initiative will not, therefore, specifically target a particular age group within the female of childbearing age demographic.

Current Programs Targeting LBW in DC

A health communications initiative is essential to the current programs addressing maternal and infant health in DC. A health communications campaign would increase awareness and educate women on how to prevent LBW as well as help inform pregnant women about programs and health centers that can offer assistance during and after pregnancy.

The DC Birth Center (DCBC) provides care primarily to women in Wards 5 and 6 and has

significantly reduced low birth weight and infant mortality rates within their own patient population by providing an integrated approach to maternal and infant health. DCBC provides family resource and support services including smoking cessation programs, teen pregnancy prevention, nutrition supplements and food security assistance. DCBC also directly aids in LBW prevention by providing prenatal care, childbirth education, WIC assistance, prevention of premature delivery and family planning / healthy pregnancy spacing initiatives. Ruth Lubic, the founder of the DCBC, states that its success lies in the relational nature of the midwife approach that "provides mental health and social work as part of the healthcare experience." Lubic's overall strategy emphasizes the human need for relationships and encourages women to be together and learn from each other during and after pregnancy.[xxix]

The DC Birth Center and other health clinics and community centers such as Planned Parenthood located in Ward 7, and DC Family and Child Services in Ward 8, can serve as outlets for the proposed health communication campaign by distributing pamphlets and displaying flyers aimed at reducing LBW.

Project DC-Hope is a LBW intervention program for pregnant women, which targets the behavioral and psychosocial risks of both active and passive (second hand) smoking, as well as partner abuse and depression. The program seeks to enroll women by week 28 of gestation.

The Teen Mothers project is aimed specifically at minority teens mothers in DC. This community-based intervention strives to decrease interpartum intervals through increased behavioral health education, partner communication and school/training involvement.[xxx]

The Special Supplemental Nutrition Program for Women, Infants and Children (WIC) aims to improve the lifelong health and nutrition of pregnant women, new mothers, infants and

children under 5 through supplemental food initiatives, nutrition education, and breastfeeding support and promotion.[xxxi]

DC Healthy Start initiative targets women of childbearing age in Wards 5, 6, 7 and 8. The program strives to decrease the rate of infant mortality by funding special initiatives including a patient incentive program, case management, education/ training and sponsoring two Maternity Outreach Mobile (MOM) Units and the H.D. Woodson Senior High School Adolescent Wellness Center.

Healthy People 2010 as well as the Millennium Development Goals also impact LBW rates by calling the attention of policy makers in the fight against LBW and infant mortality. Community organizations can use the goals outlined in these initiatives as a way to rally support and pressure policy makers. Healthy People 2010 has a goal of reducing national LBW rates to 5% and aims to decrease the racial disparities in healthcare, including in maternal and infant healthcare. Although the national LBW will clearly not be down to 5% by 2010, the Healthy People initiative is developing new programs and new benchmarks for 2020 and will therefore continue its work.[xxxii] Goal 4 of the Millennium Development Goals strives to decrease infant mortality on an international level by two-thirds by 2015 and as LBW is the second leading cause of infant death, the goal necessitates the reduction of LBW. Goal 5 seeks to improve overall maternal health which will in turn help to decrease the incidence of LBW.[xxxiii] Healthy People 2010 and the Millennium Development Goals set the bar for maternal and child healthcare and this indirectly impacts LBW rates by creating an ideal for community activists and government officials.

Program Monitoring and Evaluation

Program monitoring and evaluation is an essential aspect of this health communications proposal. The message reach and effectiveness should be measured on a regular, perhaps quarterly, basis so that necessary adjustments and improvements to the program may be made. The quarterly assessments should answer the following questions in addition to others:

1) How many members of the target audience is the message reaching?
2) Is there a subgroup within the target audience that is not being reached? For example is the message reach in Ward 5 significantly lower than in Ward 7 or 8?
3) How much of the message is the target audience retaining from each of the media channels?
4) How effective is the message in terms of initiating behavior change in the areas of smoking cessation, proper nutrition and stress management? Have these women stopped smoking or decreased smoking? Have their diets improved and how so? Are these women taking the tips for stress management? Are they seeking out help for stress management for example via nutritional supplementation programs?
5) Are members of the target audience modifying the behaviors for part of their pregnancies or all of their pregnancies?
6) Is the campaign increasing levels of communication among the target population and between the target population and healthcare providers?

A final evaluation at the end of the program will measure final health outputs of the campaign by not only assessing overall reach and effectiveness in behavior modification, but also in changes to the LBW rate among the target population. Has the LBW increased, decreased, and remained the same? What other factors could impact any change in the LBW rate?'

These assessments could be conducted in various different ways. For the quarterly assessments, central-location intercept interviews could be conducted around Ward 5, 7 and 8. Closed-ended questionnaires could also be distributed at the end of the informational session/workshops. One way to help collect demographic information regarding the martial status, smoking status, etc of women of childbearing age would to be include such questions on the annual, telephone operated Behavioral Risk Factor Surveillance Survey (BRFSS). Independent community surveys could also be conducted via mail throughout Wards 5, 7 and 8.

Program Challenges

This health communications campaign will have many unexpected challenges like all projects. One challenge the program will definitely encounter is adjusting for outside factors during monitoring and evaluation. The multivariate nature of LBW as well as the targeted behavioral factors will make it difficult to isolate the impact of the program. Program effectiveness is also difficult to measure when the target audience may be exposed to different, and sometimes contradictory, information that pushes for cigarette use, unhealthy diets, and added stressors in life. The reduction of stress will be particularly difficult to measure and so it will be important to measure the use of different management tools instead.

Another program challenge will be integrating the health communications program into the existing health care structure. The program will have to be fully incorporated into the daily work of existing programs like WIC, the DCBC, DC-Project Hope and others. This will require partnerships and awareness between programs as well as a commitment from existing programs to help disseminate the pamphlets and attend the informational sessions/workshops. Obtaining involvement of the target audience for informative

research as well as project monitoring and evaluation may also present a challenge however this challenge will most likely be easily mitigated by different incentive programs.

Conclusions

Today infants born at lower and lower birth rates are surviving due to new medical technologies and these infants are experiencing even more developmental difficulties as they grow up. The economic cost of LBW is increasing with neonatal intensive care as well as educational, custodial and long-term health care associated with LBW complications. The prevention of LBW is therefore essential and a health communications program to address some of the major underlying behavioral causes of LBW would be a unique preventative intervention.

This health communications intervention, however, will only go so far to address the multivariate complexities of LBW. The LBW problem in DC demonstrates a need for an entirely different approach to healthcare for pregnant women and their babies. A communications based, integrated maternal and infant healthcare that would facilitate more communication between health providers and pregnant women is necessary to further address LBW. The success of a relation based maternal and infant healthcare is exemplified by Ruth Lubic's communication strategy in her development of the DC Birth Center.

In addition to a new overarching healthcare strategy, another major factor of LBW needs to be addressed. Environmental factors cannot be ignored when addressing LBW. Air pollution, specifically nitrogen dioxide that is produced by car fumes, is a particular risk for LBW. The DC air pollution is particularly high and also contributes to the high LBW of the District.[xxxiv] Health communications strategies could also be employed via advocacy communication in order to modify environmental policy within DC.

Although this health communications proposal not does address all aspects of the LBW

problem, it places an emphasis on relational and preventative care and may serve as a model for other interventions. Policy addressing complex issues like that of LBW must work from various levels and from many different directions in order to create a comprehensive, fully integrated and effective framework. This proposal, therefore, is only one part of what needs to be a multidimensional policy strategy.

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