

## **Low Birth Weight among Infants in the San Antonio Metropolitan Statistical Area: A Community Health Assessment**

The U.S. Department of Health and Human Services has identified reducing low birth weight as an important health objective to meet within this decade in Healthy People 2020<sup>1</sup>.

Low birth weight (birth weight of less than 2500 grams) can have damaging implications and is a risk factor for several conditions and diseases later in life, such as hypertension<sup>1</sup>, osteoporosis<sup>2</sup>, type-2 diabetes<sup>3</sup>, chronic kidney disease<sup>4</sup>, and even lower levels of educational attainment<sup>5</sup>. Low birth weight is also the number one cause of mortality in infants less than 28 days old<sup>6</sup>.

Hypertension, osteoporosis and type-2 diabetes are currently wreaking havoc on our nation and healthcare system, and are clearly conditions that the healthcare community and those who suffer from them would like to see less of. Preventing occurrences of low birth weight could potentially lower the rate of these dangerous conditions.

Though not all contributors to low birth weight are preventable, many are. Underweight or overweight mothers are at higher risk for delivering low birth weight infants<sup>7</sup>, as are mothers who smoke, consume alcohol, or are malnourished during pregnancy<sup>8</sup>. These preventable risk factors must be addressed in order to reduce risk of low birth weight.

In the San Antonio-New Braunfels metropolitan statistical area, low birth weight has been documented as higher than both the state and national rates. According to the most recent data from the Texas Department of State Health Services, 9.3% of total live births in the San Antonio – New Braunfels metropolitan statistical area were infants with a low birth weight, compared to 8.5% of live births in the state of Texas<sup>9</sup> and 8.2% of live births in the United States<sup>6</sup>.

In many health indicators, San Antonio is a unique city, with a slightly older population and yet, less overall mortality than the rest of Texas. Most notably, the San Antonio MSA has fewer deaths from heart disease, stroke and all kinds of cancer than the state of Texas. Few causes of death in this MSA were higher than the state averages; however, chronic liver disease and cirrhosis and nephritis, nephrotic syndrome and nephrosis were among the few, along with septicemia, accidents and homicides<sup>9</sup>.

These health statistics seem to correlate with the lifestyles that the people in the San Antonio MSA lead. Females in San Antonio are much less likely to be overweight or obese, than the state or national average<sup>10</sup>. Obesity is a risk factor for heart disease, cancer and stroke, helping to explain the lower rates of these diseases in this MSA.

Liver disease and cirrhosis are often caused by alcohol abuse, which also could account for nephritis, nephrotic syndrome and nephrosis, as well as accidental deaths and homicides. Unfortunately, women in the San Antonio-New Braunfels MSA have an increased rate of heavy alcohol use compared to the state and national data<sup>10</sup>. Alcohol use during pregnancy is discouraged and can contribute to low birth weight, however, increased alcohol consumption is often associated with malnourishment another important indicator and risk factor for low birth weight.

The San Antonio MSA has different population demographics than the state of Texas as a whole and varies significantly from the national demographic profile. More than half (53.51%) of the population in this metropolitan statistical area is of Hispanic origin. Nationally, only 16.1% of the population is of Hispanic origin, and in the state of Texas, the population of people who claim Hispanic origin averages 37.2%. Also of note, is the fact that only 6.43% of residents in the San Antonio MSA identify themselves as black or African, compared to 12.5% in the state

of Texas and 13.5% nationally<sup>11</sup>. Since conditions like cardiovascular disease disproportionately affect African-American and non-Hispanic, white populations<sup>12</sup>, it is important to keep this demographic data in mind when considering the health profile for this region.

Nationally, Hispanic women have the lowest instance of low birth weight among all major ethnicities<sup>6</sup>. The San Antonio MSA also has higher percentages of its population with health insurance and more women receiving prenatal care<sup>9</sup>; it also has lower unemployment rates than the rest of Texas and much lower unemployment rates than the national averages<sup>13</sup>. With this in mind, one might assume that there is a minimal occurrence of low birth weight in this region; however, this is not the case. Clearly, something different is happening in the San Antonio-New Braunfels MSA.

There are a few telling statistics among this population that might offer insight into this issue. There is a slight increase in the number of adolescent mothers giving birth in the San Antonio MSA<sup>9</sup>. Since adolescent mothers more frequently deliver low birth weight infants, this could possibly account for some of the increase in babies born with a low-birth weight<sup>8</sup>. This could be due to a young mother's immature physiological state, but it could also be due to a lack of knowledge or prenatal care that a very young mother might not receive, increasing the likelihood that the mother was not getting proper nutrition and health advice throughout the pregnancy.

Most counties in the San Antonio-New Braunfels MSA have widespread access to supermarkets and grocery stores, substantiating that the nutritional ties to the increased incidence of low birth weight infants is not caused by lack of access to healthful foods. However, while most counties in the region enjoy easy access to supermarkets, both Bexar and Guadalupe counties have higher populations of residents with limited access to grocery stores. Bexar County

may especially contribute to a lack of resources for the MSA since a high percentage (31.37%) of its low income population has limited access to a grocery store<sup>14</sup>.

Theories have been discussed regarding access to grocery stores and the healthfulness of a person's diet, relating the environment to the quality of a person's diet<sup>15</sup>. As stated previously, maternal malnutrition, as well as being underweight or overweight are risk factors for low birth weight. Other recent reports reveal that perceived access to a nearby supermarket or grocery store may have more impact than actual access to these stores on fruit and vegetable consumption. In one study, distance to the nearest supermarket did not appear to influence the consumption of fruit and vegetables<sup>16</sup>. However, if residents of these counties in the San Antonio MSA have a perceived lack of access to healthful foods, they are likely to be discouraged from eating a healthy diet, possibly increasing risk factors for low birth weight.

An important piece of information in determining the cause of increased prevalence of low birth weight among infants in the San Antonio MSA is the markedly increased alcohol consumption for women of child-bearing age<sup>10</sup>. While alcohol consumption itself is an important risk factor for low birth weight, the solution for alcohol consumption during pregnancy is simple. The concern with these high rates of alcohol consumption among females of child-bearing age is that alcohol consumption is often inversely related to nutrient consumption, leaving a potential mother malnourished and ill-prepared for healthy pregnancy. Since many women do not realize they are pregnant until around 4-6 weeks of pregnancy, improper nutrition and use of toxic substances like tobacco and alcohol could affect the embryo at the most important and delicate stages of development.

San Antonio's increased occurrences of unwed and adolescent mothers, as well as increased rates of sexually transmitted diseases, infer that many women may be experiencing

more unplanned pregnancies. These women are less likely to be taking pre-natal vitamins or folic acid supplements at the time of conception and shortly thereafter, when proper nutrition is vital. Low folic acid levels are associated with low birth weight, as are other nutritional deficiencies<sup>17</sup>. A healthy maternal diet has been shown to affect birth weight as well as other health implications for the child. A healthy diet can mean higher cognitive function and lower blood pressure for a child, while unhealthy habits can result in hyperinsulinemia and increased risk of obesity<sup>18</sup>. Therefore, it is important that women of child-bearing age are maintaining good health through eating a nutritious diet, getting recommended amounts of exercise and limiting exposure to harmful substances, whether or not they are planning on having children in the near future.

In order to ensure that these recommendations are being considered, a community-based intervention is necessary. Studied interventions to reduce occurrence of low birth weight have emphasized birth spacing, or waiting a significant amount of time before having another child after giving birth, use of folic acid supplementation before and during pregnancy, maintaining a healthy diet and lifestyle before becoming pregnant, use of iron-folate supplements for women during pregnancy to prevent anemia, and calcium supplementation during pregnancy for prevention of gestational hypertension<sup>16</sup>. These are simple and low cost methods of reducing risk of low birth weight and should be considered among the most pertinent objectives for such an intervention.

The goal for the intended intervention should be to increase awareness of the causes and effects of low-birth weight in infants. Educating the public on how and why pregnancies result in low birth weight infants can help change behaviors, such as smoking or drinking while pregnant, or failing to maintain a healthy dietary status before and during pregnancy. It may also be

prudent to reinforce the importance of safe-sex practices like abstinence and protective contraception.

Specifically, the Centers for Disease Control and the U.S. Public Health Service already set recommendations for women of child bearing age to consume 400 micrograms of folic acid per day<sup>19</sup>; reinforcing that recommendation would benefit this cause. Encouraging consumption of milk and other dairy products in place of sugar sweetened beverages would be beneficial for most of the public, but would be especially appropriate for our target audience to increase calcium consumption. Increasing consumption of foods naturally high in iron and folate, like spinach, is also important in maintaining a healthy pregnancy. These goals are crucial to maintaining a healthy diet among potential mothers and decreasing the number of low-birth weight infants born in the San Antonio-New Braunfels metropolitan statistical area.

Since the intended audience for a nutrition intervention is women in the San Antonio-New Braunfels MSA who are more likely to have an unplanned pregnancy, it would be prudent to target that audience through college and high school campuses in the area, most notably in their food courts, restaurants and cafeterias. Signs and fliers should be displayed for students that include information on which foods provide nutrients essential for a healthy pregnancy outcome and should encourage substituting sugar sweetened beverages for milk. These marketing tools should be clear, simple and easy to understand, but subtle enough to prevent embarrassment and thus reduce participation. Even supposing that not all unplanned pregnancies occur in young women at the high school and college ages, these women will likely take the information that they learn and apply it in later phases of their lives. Similar interventions have reduced the rate of low birth weight by nearly 40% for program participants<sup>20</sup>. If wide spread implementation of this intervention occurs, similar results could be expected, especially over a period of about 10 years

as more and more women of child-bearing age are educated. Educating these young women at an early age could prevent low-birth weight and other detrimental pregnancy outcomes not only now, but also in the future.

The San Antonio-New Braunfels metropolitan statistical area's increased incidence of low birth rate can likely be reduced through education of its population of the nutritional relationship between a healthy pregnancy outcome and infants born with low-birth weight. Increased rates of children born to adolescent mothers and to mothers who are unmarried, in coordination with the abnormally high instances of sexually transmitted disease, paint a likely picture of an increased rate of unplanned pregnancies. Improving the habits and lifestyles of women of child-bearing age before and during pregnancy will likely play an important role in decreasing the prevalence of low-birth weight infants born to women in the San Antonio–New Braunfels metropolitan statistical area. Reaching out to educate women early will hopefully spare them of unfortunate pregnancy outcomes later in life and reduce their risk of giving birth to an infant with low or very low birth weight.

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