

# Very-Low-Birthweight Infants and Income Incongruity among African American and White Parents in Chicago

## ABSTRACT

**Objectives.** Illinois vital records for 1982/1983 and US census income data for 1980 were analyzed to ascertain the relationship of income incongruity, race, and very low birthweight.

**Methods.** Positive income incongruity was considered present when study infants resided in wealthier neighborhoods than non-Latino Whites at the same level of parental education attainment and marital status.

**Results.** The odds ratios of very low birthweight for African Americans ( $n = 44\ 266$ ) and Whites ( $n = 27\ 139$ ) who experienced positive income incongruity were 0.7 (95% confidence interval [CI] = 0.5, 0.9) and 0.6 (95% CI = 0.5, 0.9), respectively.

**Conclusions.** Positive income incongruity is associated with lower race-specific rates of very low birthweight. (*Am J Public Health.* 1997; 87:414-417)

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### Introduction

The disparity in African American and White very-low-birthweight (<1500 g) rates has grown over the last 3 decades.<sup>1,2</sup> Researchers have been unable to identify a combination of individual-level risk factors that explain this epidemiologic enigma.<sup>3-6</sup> However, the usual socioeconomic variables do not fully capture the impact of race on place of residence. On average, African Americans who attend college earn less than White high school dropouts, and female-headed African American and White households show differences in terms of income.<sup>7</sup> In the vast majority of urban areas, the geographic separation of the races is almost complete.<sup>8,9</sup> Polednak reported that this residential pattern contributes to the racial disparity in infant mortality rates.<sup>10</sup> The degree to which this association is related to decreased economic, educational, and general opportunities is unknown. Negative income incongruity is a proposed entity that comes into play when a person resides in a poorer neighborhood than a reference population of Whites with the same education attainment and marital status. Conversely, positive income incongruity is present when one lives in a wealthier community than expected for a given level of education attainment and marital status. Income incongruity may be a better reflection of social inequities than socioeconomic status alone.

For these reasons, we designed a study to delineate the extent to which income incongruity affects the relationship between parental race and rates of very low birthweight.

### Methods

We used a data set of 1982 and 1983 Illinois vital records and 1980 US census income information to examine all non-Latino African American and White singleton infants born to Chicago residents.

Infants born to two White parents were used as a reference population to define income incongruity. Negative income incongruity was considered present when the median family income of the mother's census tract residence was one standard deviation below the mean income of non-Latino Whites with the same number of years (<12, 12, 13 through 15,  $\geq 16$ ) of parental education and marital status. Positive income incongruity was considered present when the median family income of the mother's census tract residence was one standard deviation above the mean income of non-Latino Whites with the same number of years of parental education and marital status. For infants with two African American parents, the records of 15 466 (31%) had missing information on paternal education, 138 (0.3%) had missing information on maternal education, and 28 (<0.01%) had missing data on marital status. For infants with two White parents, the records of 1783 (6%) had missing information on paternal education, 151 (0.5%) had missing information on maternal education, and 98 (<0.01%) had missing data on marital status. All of the records included information regarding place of residence.

We calculated the proportion of very-low-birthweight infants according to the type and level of income incongruity. Odds ratios and 95% confidence intervals (CIs) were calculated for each two-by-two analysis. Confidence intervals were estimated by the Taylor series method.<sup>11</sup> Logistic regression analyses were used to

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**TABLE 1—Distribution of Income Incongruity in African American and White Infants: Chicago, 1982/1983**

|  | African American, % | White, % | Odds Ratio <sup>a</sup><br>(95% Confidence Interval) |
|--|---------------------|----------|--|
| Income incongruity according to individual variable <sup>b</sup> |                     |          |  |
| Positive   | 7                   | 42       | 0.1 (0.1, 0.1)                                       |
| None   | 18                  | 42       | 0.3 (0.3, 0.3)                                       |
| Negative   | 75                  | 15       | 17.0 (16.0, 17.4)                                    |
| Income incongruity according to multiple variables <sup>c</sup>  |                     |          |  |
| Positive   | 1                   | 11       | 0.1 (0.1, 0.1)                                       |
| None   | 73                  | 83       | 0.6 (0.5, 0.6)                                       |
| Negative   | 26                  | 6        | 5.3 (5.1, 5.6)                                       |

Note. As a result of rounding, percentages may not sum to 100.

<sup>a</sup>African Americans in comparison with Whites.

<sup>b</sup>Maternal education, paternal education, or marital status (n = 44 266 for African Americans, n = 27 139 for Whites).

<sup>c</sup>Maternal education, paternal education, and marital status (n = 32 532 for African Americans, n = 27 309 for Whites).

**TABLE 2—Distribution of Selected Sociodemographic Characteristics, by Income Incongruity and Race: Chicago, 1982/1983**

| Characteristic            | Negative Income Incongruity, % |                     | No Income Incongruity, %         |                       | Positive Income Incongruity, % |                     |
|---------------------------|--------------------------------|---------------------|----------------------------------|-----------------------|--------------------------------|---------------------|
|                           | African American<br>(n = 9037) | White<br>(n = 1542) | African American<br>(n = 26 065) | White<br>(n = 22 944) | African American<br>(n = 430)  | White<br>(n = 2823) |
| Maternal age <20 y*       | 29                             | 11                  | 27                               | 10                    | 31                             | 9                   |
| Maternal education <12 y* | 39                             | 23                  | 35                               | 19                    | 38                             | 21                  |
| Unmarried status*         | 72                             | 16                  | 73                               | 16                    | 67                             | 15                  |
| High parity*              | 31                             | 13                  | 29                               | 15                    | 30                             | 13                  |

Note. Levels of income incongruity were defined according to maternal education, paternal education, and marital status. Parity was defined as high in third or higher numbered births to women 25 years of age and fourth or higher numbered births to women 25 to 29 years of age.

\*P < .01 (for African Americans in comparison with Whites).

control for maternal age, education, marital status, and parity.<sup>12</sup> Given the large number of records with missing data on paternal education, this variable was excluded from the logistic regression models.

## Results

The parents of African American infants were five times as likely to experience negative income incongruity (based on maternal education, paternal education, and marital status) as the

parents of White infants (Table 1). The opposite phenomenon occurred with respect to positive income incongruity (Table 1). The racial differential widened when income incongruity was based on a single individual-level variable. Within each race, the distribution of selected maternal sociodemographic variables did not vary by income incongruity (Table 2). However, African American infants had a greater percentage of high-risk characteristics than White infants.

Table 3 shows race-specific very-low-birthweight rates according to the type

and level of income incongruity. Rates were lowest among infants with parents who experienced positive income incongruity, defined according to maternal education, paternal education, and marital status. When income incongruity was based on maternal education, paternal education, or marital status, the odds ratios of very low birthweight for African Americans (n = 44 266) and Whites (n = 27 139) who experienced positive (as compared with no) income incongruity were 0.7 (95% CI = 0.5, 0.9) and 0.6 (95% CI = 0.5, 0.9), respectively. Negative income incongruity was uniformly unrelated to race-specific very-low-birthweight rates. The position of African Americans relative to Whites was essentially unaffected by the type and direction of income incongruity. In the negative income incongruity, no income incongruity, and positive income incongruity strata, the crude odds ratios of very low birthweight for African American (vs White) infants were 2.0 (95% CI = 1.5, 2.6), 2.4 (95% CI = 1.9, 3.0), and 2.9 (95% CI = 2.1, 4.1), respectively.

We used logistic regression models to control for racial differences in maternal age, education, marital status, and parity. In the negative income incongruity, no income incongruity, and positive income incongruity strata, the adjusted odds ratios of very low birthweight for African American (vs White) infants were 2.4 (95% CI = 1.5, 4.1), 2.6 (95% CI = 2.3, 3.3), and 2.1 (95% CI = 1.2, 4.8), respectively.

## Discussion

The present study sought to ascertain the extent to which the discrepancy between expected and actual place of residence, based on level of parental education attainment and marital status, is a risk factor for very-low-birthweight infants. We found that only 7% of African American births, as compared with 42% of White births, occurred in couples experiencing some form of positive income incongruity. For both races, this novel entity is associated with a lower proportion of very-low-birthweight infants, especially when defined by more than one individual-level variable. In contrast, although the vast majority of African Americans and a significant percentage of Whites experience some form of negative income incongruity, it appears to be unrelated to very-low-birthweight rates.

Positive income incongruity may capture a component of social advantages

**TABLE 3—Proportion of Very-Low-Birthweight (<1500 g) Infants, by Type and Direction of Income Incongruity and Race: Chicago, 1982/83**

|  | Negative Income Incongruity, % |       | No Income Incongruity, % |       | Positive Income Incongruity, % |       | African American OR <sup>a</sup> (95% CI) | White OR <sup>a</sup> (95% CI) |
|--|--------------------------------|-------|--------------------------|-------|--------------------------------|-------|---|--------------------------------|
|  | African American               | White | African American         | White | African American               | White |   |                                |
| Maternal education <sup>b</sup>                    | 2.5                            | 1.3   | 2.6                      | 1.0   | 3.2                            | 0.7   | 1.3 (0.9, 1.7)                            | 0.7 (0.5, 1.0)                 |
| Paternal education <sup>c</sup>                    | 2.3                            | 1.0   | 2.5                      | 1.0   | 1.3                            | 0.6   | 0.5 (0.3, 1.0)                            | 0.6 (0.4, 1.0)                 |
| Marital status <sup>d</sup>                        | 2.5                            | 1.4   | 3.2                      | 1.1   | 2.3                            | 0.7   | 0.7 (0.5, 0.9)                            | 0.8 (0.6, 1.0)                 |
| Parental education and marital status <sup>e</sup> | 2.6                            | 1.0   | 2.6                      | 1.0   | 1.0                            | 0.5   | 0.4 (0.2, 1.1)                            | 0.5 (0.3, 0.9)                 |

Note. OR = odds ratio; CI = confidence interval.

<sup>a</sup>Comparison of positive with no income incongruity.

<sup>b</sup>Income incongruity defined by maternal education for African Americans (n = 48 949) and Whites (n = 28 309).

<sup>c</sup>Income incongruity defined by paternal education for African Americans (n = 33 621) and Whites (n = 26 677).

<sup>d</sup>Income incongruity defined by marital status for African Americans (n = 49 059) and Whites (n = 28 362).

<sup>e</sup>Income incongruity defined by maternal education, paternal education, and marital status for African Americans (n = 32 532) and Whites (n = 27 709).

not ascertained by traditional socioeconomic variables such as level of education attainment. We used it as a proxy of community wealth. In addition to the absence of public housing, communities composed of a large percentage of families who experience positive income incongruity are likely to benefit from the presence of political clout and quality medical care. As such, the influence of positive income incongruity on pregnancy outcome is probably due to improved general opportunities that optimize childhood and adult health. Not surprisingly, there is a wide racial differential in the percentage of parents who experience positive income incongruity. However, race-specific very-low-birthweight rates are lowest among infants with parents who experience positive income incongruity at multiple levels. This suggests that positive income incongruity is a protective variable for both races. Given the paucity of such factors among African American women, this finding has greater public health implications for African American women. For example, the very-low-birthweight rate among infants born to African Americans who experience positive income incongruity is less than half of that for infants born to African American women who received an adequate number of prenatal care visits; the rate for Whites who experience positive income incongruity is equivalent to that of Whites who received an adequate number of prenatal care visits.<sup>4</sup>

The proportion of very-low-birthweight African American infants approximates that of the general White population only when positive income incongruity is

present. However, consistent with a large body of research on traditional sociodemographic variables,<sup>3-6,13</sup> the racial disparity in very-low-birthweight rates persists in the presence of positive income incongruity. African American women in this small subgroup are likely to suffer more psychophysiological stress related to discrimination and social isolation than their White counterparts.<sup>1,14-16</sup> In addition, they may have a shorter interpregnancy interval.<sup>17</sup> The extent to which intergenerational factors underlie the disproportionately high rate of very-low-birthweight African American infants is also unclear. Further research on the relatively low-risk group of women who experience positive income incongruity may uncover the contribution of these and other nonclassical risk factors to the racial disparity in rates of very low birthweight.

A large percentage of African American births occur in the context of negative income incongruity. We were surprised to find that negative income incongruity was not a risk factor for very low birthweight. In Chicago, African Americans reside in communities that are 90% African American. Thus, residential segregation is probably antecedent to, rather than confounded by, negative income incongruity. As such, it may be the primary determinant of the African American pregnancy disadvantage.<sup>10</sup> A study using a database from an integrated city is needed to fully delineate the relationship of negative income incongruity to very-low-birthweight rates among African Americans.

The present study has certain intrinsic limitations. For example, the relatively small number of African Americans who

experience positive income incongruity limits the generalizability of the study. Moreover, the high percentage of birth records with missing paternal education information hindered our ability to fully investigate the contribution of income incongruity to the racial disparity in very-low-birthweight infants. The possible interaction of income incongruity with marital status among African Americans is of particular concern. There is also the theoretical problem of making causal inferences from group data to individual behaviors. However, a postulate of the present study was that income incongruity is a community-level entity.<sup>18,19</sup> Finally, the association between positive income incongruity and very-low-birthweight rates may be due to the presence of unmeasured factors. Availability and use of quality prenatal care services are possibilities.<sup>20,21</sup> Other studies are needed to establish a causal pathway between positive income incongruity and very-low-birthweight rates.

Notwithstanding these limitations, we conclude that positive income incongruity is associated with lower race-specific rates of very low birthweight. Given the marked racial differential in place of residence, further research on income incongruity and other community-level variables may help us to better understand the racial disparity in very-low-birthweight rates. □

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## Health Care Seeking Behaviors Related to Sexually Transmitted Diseases among Adolescents

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### Introduction

Delayed seeking of health care may partially explain high rates of sexually transmitted diseases among adolescents.<sup>1,2</sup> Health care seeking refers to the interval between recognition of a health problem and its clinical resolution and to the accompanying cognitive and behavioral responses.<sup>3</sup> Health care seeking is a central issue in control of sexually transmitted diseases, since the duration of infection increases the probability of harmful sequelae and of transmission to others.<sup>4,5</sup>

Sexually transmitted disease-related health care seeking was examined among adolescents attending a public sexually transmitted disease clinic in Chicago, Ill. Care seeking was viewed as an interval requiring time for problem "appraisal" (assessment of the nature of the problem and the need for clinical care), as well as time to act on the decision to seek care.<sup>6</sup> Delay in obtaining care after the need for care was recognized was labeled as the "procrastination" interval, although some factors that may contribute to delay are not within a patient's control.<sup>2</sup>

### Methods

To be eligible to participate, individuals had to be less than 21 years of age and able to comprehend English. Symptomatic subjects were defined as those with penile or vaginal discharge, dysuria, or pelvic pain. Asymptomatic subjects were defined as those without genital symptoms who sought care after being informed of potential infection by partners or by public health personnel. Patients with genital warts or ulcers and those with a problem duration of more than 35 days were ineligible.

Eligible patients included 129 male adolescents and 194 female adolescents. Among those eligible, 79 male patients (61%) and 129 female patients (67%) participated. Nonparticipants did not dif-

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## ABSTRACT

**Objectives.** This study identified social, cognitive, and behavioral factors associated with how adolescents seek health care for sexually transmitted diseases.

**Methods.** Data for male and female adolescents (n = 208) attending a clinic specializing in sexually transmitted diseases were examined.

**Results.** Symptomatic female adolescents required greater time to obtain care than asymptomatic female adolescents or symptomatic male adolescents. Factors affecting duration of care seeking interval included perception of barriers to care, lower self-efficacy for response to a sexually transmitted disease, greater perceived seriousness of sexually transmitted diseases, previous history of sexually transmitted diseases, and stigma.

**Conclusions.** Improved secondary sexually transmitted disease prevention efforts among adolescents require reductions in barriers to care and improved symptom recognition by adolescents. (*Am J Public Health*. 1997;87:417–420)