African American Women's Lifetime Upward Economic Mobility and Preterm Birth: The Effect of Fetal Programming

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Objectives. We investigated whether African American mothers' upward economic mobility across the life course and having been of low birth weight are associated with the preterm birth of their children.

Methods. We performed stratified and multilevel logistic regression analyses on an Illinois transgenerational data set of African American infants (born 1989–1991) and their mothers (n = 11 265; born 1956–1976) with appended US Census income information.

Results. African American mothers with a lifelong residence in impoverished neighborhoods had a preterm birthrate of 18.7%. African American mothers with early life impoverishment who experienced low, modest, or high upward economic mobility by adulthood had lower preterm birthrates of 16.0% (rate ratio [RR] = 0.9; 95% confidence interval [CI] = 0.8, 0.9), 15.2% (RR = 0.8; 95% CI = 0.7, 0.9), and 12.4% (RR = 0.7; 95% CI = 0.6, 0.8), respectively. In multilevel logistic regression models of former low birth weight and non–low birth weight mothers aged 20 to 35 years, the adjusted odds ratio (95% confidence interval) of preterm birth for those who experienced high upward economic mobility (vs those with lifelong impoverishment) was 0.9 (0.5-1.6) and 0.7 (0.5-0.9), respectively.

Conclusions. African American mother's upward economic mobility from early life impoverishment is associated with a decreased risk of preterm birth. However, consistent with fetal programming, this phenomenon fails to occur among mothers born at low birth weight. (*Am J Public Health.* 2011;101:714–719. doi:10.2105/AJPH.2010.195024)

African American women's increased risk of preterm birth is a long-standing epidemiological enigma and a major public health problem.[1–3] Moreover, it contributes to the United States' poor international ranking in preterm births.[4] A life course conceptual model has been proposed to explain the adverse pregnancy outcome of African American women.[5–7] In this model, the high rate of preterm birth among African American (compared with non-Latino White) women reflects their higher prevalence of contextual risk factors and their paucity of protective contextual factors across the entire life course from conception until reproductive age.[7]

Numerous studies show that neighborhood poverty is a risk factor for preterm birth in both races.[8–10] By contrast, a limited available literature shows that African American and White women's exposure to neighborhood affluence during adulthood is a contextual phenomenon associated with a lower risk of preterm birth.[10,11] However, these studies employed cross-sectional designs in which ecological risk estimates were derived from women's place of residence at or near the time of delivery. Given the disproportionately large percentage of African American (compared with White) women with early life residence in impoverished neighborhoods,[12] the impact of upward economic mobility across the life course on pregnancy outcome may be particularly important in helping us understand and eliminate the mechanisms underlying the racial disparity in preterm birth. Colen et al. provided preliminary evidence that upward socioeconomic mobility measured at the individual level was associated with lower rates of low birth weight (LBW; <2500 g) among a sample of White women who were poor as children, but this trend did not occur among African Americans.[13] A more recent population-based study found that infant LBW rates declined as the adulthood economic environment of African American women with early life exposure to neighborhood poverty improved.[14] To our knowledge, no study has ascertained the impact of upward economic mobility from early life impoverishment to adulthood affluence on preterm birth and infant mortality.

Fetal programming acts at the level of the DNA in a phenomenon called epigenetics. There has been a rapid outpouring of studies that describe what is programmed during fetal life with regard to the health status of that fetus as an adult.[15–17] Researchers have used LBW as the major marker for aberrant fetal programming. LBW is a well-documented risk factor for the leading chronic diseases of adulthood, including type II diabetes, coronary artery disease, and hypertension.[15–17] Fetal undernutrition is the leading explanation.[16] An expanding literature shows that maternal LBW is also a risk factor for preterm birth in both races.[18–20] Thus, disadvantaged economic conditions may limit the growth of a woman's fetuses and program her reproductive physiology to deliver preterm infants during adulthood. This effect may be related to altered feedback resistance as a consequence of altered expression of glucocorticoid receptors in the developing female fetal brain.[21–25] The extent to which aberrant female reproductive programming modifies the association of contextual factors across the life course and preterm birth is incompletely understood.

We, therefore, undertook an analysis of Illinois vital records and US Census income data to determine the extent to which former LBW and non–LBW African American women's upward economic mobility across the life course is associated with the preterm birth of their children. We hypothesized that African American women's upward economic mobility from early life residence in impoverished neighborhoods to adulthood residence in affluent neighborhoods is a protective contextual phenomenon associated with a lower risk of preterm birth.

METHODS

A detailed description of the Illinois transgenerational birth file has been published.[26]

Briefly, the Illinois Department of Vital Records provided data tapes for the index years of 1989 to 1991. These data included approximately 583 600 infants. The state also provided more than 4 million birth files for the parents of the index births who were born between 1956 and 1976. There were approximately 328 000 singleton infants in the 1989 to 1991 cohort with mothers born in Illinois between 1956 and 1976. On the basis of each mother's maiden name (first and last) and exact date of birth, we successfully linked 79% (267 303) of maternal birth records to infant records. Failure to match usually arose from minor spelling errors in the mother's and infant's records. In both generations, African American race was defined by mother's race and origin (non-Hispanic) listed on the infant's birth certificate. The study population was limited to Illinois-born singleton African American infants of Illinois-born African American mothers aged 15 to 35 years.

For the 1989 to 1991 cohort born in the Chicago metropolitan area (Cook County, IL), we appended 1990 US Census income information to each birth record according to census tract or suburb of residence recorded on the birth certificate; we used this neighborhood-level income value to estimate maternal economic environment during adulthood and pregnancy.[26] For the 1956 to 1965 cohort born in Chicago, we appended 1960 US Census income to each birth record by community area (1956–1960) or census tract for years where valid tracts were available (1961–1965); for the 1966 to 1975 cohort born in Chicago, we appended the 1970 US Census income to each birth record by census tract.[26] We used these values to estimate maternal residential environment during early life (i.e., fetal, infancy, and childhood).

Economic Environment

Census tracts are small areas designed to follow natural urban boundaries, such as railroad grades and highways, thus approximating real neighborhoods. In Chicago, there are 873 census tracts. They typically contain fairly homogeneous populations numbering from 1500 to 8000.[26] Most pertinent, with few exceptions the census tract geography has remained constant. Demographers at the University of Chicago, in cooperation with the city of Chicago, created the system of community areas, meant to reflect naturally occurring neighborhoods, in the 1920s.[27] There are 77 community areas, made up of approximately 11 census tracts (range 1 to 36). These geographic units, although a cruder reflection of the neighborhood in which the family resided, provide approximate information on social context where census tract–level coding was not available (i.e., 1956–1960).

Census tract or community area median family income was empirically used to define neighborhood income status. This continuous measure was divided into quartiles separately for neighborhood income at the time of the mother's birth (i.e., early life) and neighborhood income at the time of the infant's birth (i.e., adulthood). Four economic environments of interest over the mother's lifetime were defined: early life and adulthood residence in first quartile neighborhoods (lifelong impoverishment), early life residence in first quartile and adulthood residence in second quartile neighborhoods (low upward mobility), early life residence in first quartile and adulthood residence in third quartile neighborhoods (modest upward mobility), and early life residence in first quartile and adulthood residence in fourth quartile neighborhoods (high upward mobility).

We performed a sensitivity analysis among African American mothers with early life residence in second quartile (moderately impoverished) neighborhoods. For mothers with early life residence in second quartile neighborhoods, we calculated rates of preterm birth among those with adulthood residence in the third or fourth quartile (upward mobility) compared with those with lifelong residence in second quartile neighborhoods.

The median income (adjusted for inflation to 1989 dollar amounts) of early life economic environment for the lowest early life first quartile ranged from $10 048 to $21 646, and the second quartile ranged from $21 647 to $27 427. The median income of adulthood economic environment for the lowest quartile ranged from $4999 to $23 425, the second quartile ranged from $23 426 to $35 427, the third quartile ranged from $35 428 to $45 871, and the highest quartile ranged from $45 872 to $150 001.

Statistical Analyses

Individual-level variables we examined included maternal birth weight, age, education, parity, marital status, smoking status, month of prenatal care initiation, and number of prenatal care visits. We categorized the adequacy of prenatal care each mother received during the pregnancy according to the Adequacy of Prenatal Care Utilization Index.[28]

Within each of the 4 strata of economic environments, we calculated preterm birth (<37 weeks) and infant mortality (death within 365 days of birth) rates. Next, we determined the distribution of individual-level risk factors within each stratum. We computed preterm birthrates by maternal birth weight and age. We calculated the rate ratio (RR) and 95% confidence intervals (CIs) for the relationship between women's upward economic mobility and preterm birthrate, using women with a lifelong residence in the first quartile as the respective common reference group.[29]

Finally, we constructed multilevel logistic regression models to account for the nesting of individual births (level 1) within either maternal early life (level 2) or adulthood (level 2) neighborhood.[29,30] We examined the relationship between upward mobility (compared with lifelong impoverishment) and preterm birth in crude multilevel logistic regression models. We assessed effect modification for each of the individual-level factors. Multivariable models controlled for maternal birth weight, age, education, parity, marital status, cigarette smoking status, and adequacy of prenatal care utilization. We then restricted models to women 20 years and older, given the effect modification by age, and stratified by maternal birth weight. We generated the crude odds ratios (CORs), adjusted odds ratios (AORs), and 95% CIs from the final models by taking the antilogarithm of the b-coefficients for each independent variable and the CIs for those coefficients using PROC NLMIXED in SAS version 9.2 (SAS Institute, Cary, NC) for multilevel modeling.[29]

RESULTS

African American mothers who experienced lifelong impoverishment (n=11 265) had a preterm birthrate of 18.7%. African American mothers with early life impoverishment who experienced low (n=5832), modest (n=2256), or high (n=732) upward economic mobility by adulthood had lower (compared with those

with lifelong impoverishment) preterm birthrates of 16.0%, 15.2%, and 12.4%, with crude rate ratios (CRRs; 95% CIs) of 0.9 (0.8, 0.9), 0.8 (0.7, 0.9), and 0.7 (0.6, 0.8), respectively. Infants born to mothers who experienced lifelong impoverishment had a first-year mortality rate of 23 per 1000. Infants born to mothers with early life impoverishment who experienced low, modest, or high upward economic mobility by adulthood had lower (as compared with those with lifelong impoverishment) first-year mortality rates of 19 per 1000, 18 per 1000, and 11 per 1000, with CRRs (95% CIs) of 0.8 (0.7, 1.0), 0.8 (0.6, 1.1), and 0.5 (0.2, 1.0), respectively.

With the exception of LBW, African American mothers with early life impoverishment who experienced low, modest, or high upward economic mobility had a lower prevalence of high-risk individual-level sociodemographic, medical, and behavioral characteristics during adulthood than did those who experienced lifelong impoverishment (Table 1).

Table 2 shows preterm birthrates according to selected maternal individual-level risk factors and lifetime economic environment. Among former non–LBW African American mothers, the rate of preterm birth was significantly lower for those who experienced low, modest, or high upward economic mobility compared with those who experienced lifetime impoverishment. We did not see this pattern among former LBW African American mothers. Among teenage African American mothers, the risk of preterm birth was not reduced for those who experienced any upward economic mobility compared with those who experienced lifetime impoverishment. By contrast, among African American mothers aged 20 to 35 years, the risk of preterm birth was significantly lower for those who experienced low, modest, or high upward economic mobility compared with those who experienced lifetime impoverishment. The interaction term for upward economic mobility by maternal age was significant (P=.04).

Table 3 shows the results of our multilevel regression models with neighborhood of residence at the time of infant's birth as the random effect. When the multilevel model was restricted to former LBW 20- to 35-year-old mothers (Model A2), the 95% CI for both the COR and AOR of preterm birth for those who experienced low, modest, and high upward mobility (compared with lifelong residence in impoverished neighborhoods) included 1. In the multilevel model of former non–LBW 20- to 35-year-old mothers (Model A3), the CORs (95% CI) of preterm birth for women who experienced low, modest, or high upward mobility were less than unity. However, when controlling for maternal age, education, marital status, parity, cigarette smoking status, and prenatal care usage, the AOR of preterm birth for those who experienced upward mobility (compared with lifelong impoverishment) remained significantly less than unity only among those who experienced high upward mobility (OR=0.7; 95% CI=0.5, 0.9).

Table 3 also shows the results of our sensitivity analysis to determine whether this pattern is consistent among mothers with early life residence in moderately impoverished neighborhoods (quartile 2). We found a significant interaction between upward mobility and maternal birth weight among mothers aged 20 to 35 years (P=.003). Although the COR and AOR for upward mobility were greater than 1 for former LBW mothers (with the 95% CI including the null value [model B2]), the COR and AOR for former non–LBW mothers were 0.7 (95% CI=0.6, 0.9) and 0.8 (95% CI=0.7, 1.0), respectively (model B3).

TABLE 1—Residential Environment and Maternal Characteristics: Illinois Transgenerational Birthfile, Cook County, 1989–1991

Maternal Characteristics	Residential Environment at Birth/Adulthood			
	1st/1st Quartile (n = 11 265),%	1st/2nd Quartile (n = 5832),%	1st/3rd Quartile (n = 2256),%	1st/4th Quartile (n = 732),%
Birth weight, g				
<2500	15.0	13.7	13.0	13.9
≥2500	85.0	86.3	87.0	86.1
Age, y*				
<20	22.4	13.6	9.8	11.1
20–29	61.2	64.4	61.4	56.2
30–35	16.4	22.1	28.9	32.8
Education, y*				
<12	42.2	24.1	13.6	16.6
12	38.2	38.8	37.1	29.0
>12	19.6	37.2	49.2	54.5
Parity*				
High (≥3 previous pregnancies)	34.4	30.9	26.8	25.3
Low (1–2 previous pregnancies)	44.1	47.0	51.3	48.8
Zero	21.5	22.2	21.9	26.0
Marital status*				
Married	14.0	28.5	43.6	47.3
Unmarried	86.0	71.5	56.4	52.7
Prenatal care*				
None or inadequate	35.8	27.5	22.5	19.1
Intermediate or adequate	46.3	51.7	53.9	58.9
Adequate or better	17.9	20.7	23.6	21.9
Cigarette smoker*				
Yes	25.8	22.8	16.9	17.4
No	74.2	77.2	83.1	82.7

*$P \leq .001$ for the χ^2 test of association between each characteristic and adulthood residential environment.

DISCUSSION

Our population-based study shows that African American women's upward economic mobility from early life impoverishment is

TABLE 2—Preterm Birth Rates According to Selected Individual-Level Risk Factors Within Lifetime Residential Environment Groups: Illinois Transgenerational Birthfile, Cook County, 1989–1991

	Residential Environment at Birth/Adulthood						
Maternal Characteristics	1st/1st Quartile, PTB Per 100 Live Births	1st/2nd Quartile, PTB Per 100 Live Births	1st/3rd Quartile, PTB Per 100 Live Births	1st/4th Quartile, PTB Per 100 Live Births	1st/2nd Quartile, RR (95% CI)	1st/3rd Quartile, RR (95% CI)	1st/4th Quartile, RR (95% CI)
Birth weight, g							
<2500	23.4	20.0	19.7	17.9	0.9 (0.7, 1.0)	0.8 (0.6, 1.1)	0.8 (0.5, 1.2)
≥2500	18.5	15.9	15.0	11.9	0.8 (0.8, 0.9)	0.8 (0.7, 0.9)	0.6 (0.5, 0.8)
Age, y							
<20	19.1	19.2	16.3	19.8	1.0 (0.9 1.2)	0.8 (0.6, 1.1)	1.0 (0.7, 1.6)
20–29	18.1	15.5	14.4	10.7	0.8 (0.7, 0.9)	0.9 (0.7, 0.9)	0.6 (0.5, 0.8)
30–35	20.1	15.4	16.9	12.9	0.8 (0.7, 0.9)	0.8 (0.7, 1.0)	0.6 (0.4, 0.9)
Education, y							
<12	20.9	20.1	19.5	16.7	1.0 (0.9, 1.1)	0.9 (0.7, 1.2)	0.8 (0.5, 1.2)
12	18.2	15.7	16.5	12.9	0.8 (0.7, 1.0)	0.9 (0.8, 1.0)	0.7 (0.5, 1.0)
>12	14.5	13.4	13.0	10.6	0.9 (0.8, 1.1)	0.9 (0.7, 1.1)	0.7 (0.5, 1.0)
Parity							
High (≥3 previous pregnancies)	21.7	18.7	17.2	11.4	0.9 (0.8, 1.0)	0.8 (0.7, 0.9)	0.5 (0.4 0.8)
Low (1–2 previous pregnancies)	17.3	14.8	13.2	12.9	0.9 (0.8, 1.0)	0.8 (0.7, 0.9)	0.7 (0.6, 1.0)
Zero	16.5	14.6	17.4	12.6	0.9 (0.8, 1.0)	1.1 (0.9, 1.3)	0.8 (0.5, 1.1)
Marital status							
Married	13.2	12.2	12.0	9.0	0.9 (0.8, 1.1)	0.9 (0.7, 1.1)	0.7 (0.5, 1.0)
Not married	19.5	17.4	17.7	15.5	0.9 (0.8, 1.0)	0.9 (0.8, 1.0)	0.8 (0.6, 1.0)
Prenatal care							
None or inadequate	17.9	16.8	14.3	16.1	0.9 (0.8, 1.1)	0.8 (0.6, 1.0)	0.9 (0.6, 1.3)
Intermediate or adequate	12.0	9.1	7.7	5.7	0.8 (0.7, 0.9)	0.6 (0.5, 0.8)	0.5 (0.3, 0.7)
Adequate or better	35.2	30.6	32.1	26.8	0.9 (0.8, 1.0)	0.9 (0.8, 1.1)	0.8 (0.6, 1.0)
Cigarette smoker							
Yes	22.6	21.1	20.7	20.5	0.9 (0.8, 1.1)	0.9 (0.7, 1.1)	0.9 (0.6, 1.3)
No	17.3	14.4	14.1	10.7	0.8 (0.8, 0.9)	0.8 (0.7, 0.9)	0.6 (0.5, 0.8)

Note. CI = confidence interval; PTB = preterm birth rates; RR = rate ratio.

associated with lower rates of preterm birth and infant mortality compared with African American women with lifelong residence in impoverished neighborhoods. Most striking is the fact that contextual factors appear to account for the substantial decline in the rates of preterm birth only among formerly impoverished African American women who experience high upward economic mobility by adulthood, as this association persists after controlling for individual-level factors. Consistent with a fetal programming theory of reproductive outcome, our stratified and multilevel logistic regression analyses show that preterm birthrates are not significantly reduced among former LBW African American women who experience upward economic mobility across the life course compared with those who experience lifetime impoverishment.

African American mothers with a lifelong residence in impoverished neighborhoods have a very high rate of preterm birth, suggesting that lifelong social and economic disadvantages contribute to the current racial disparity in preterm birth. Few studies have examined the impact of maternal upward mobility on birth outcome.[13,14] Using a nationally representative sample, Colen et al. found that upward socioeconomic mobility from childhood impoverishment measured as a continuous variable at an individual-level variable was not associated with improved birth outcome among African American women.[13] However, the earlier investigation had methodological limitations associated with the lack of contextual variables.[13] Consistent with an improvement in the distribution of traditional individual-level sociodemographic, medical, and behavioral risk factors during adulthood, our population-based study shows that formerly impoverished African American women who experience even low or modest upward economic mobility by adulthood have lower rates of preterm birth than do those with lifelong residence in impoverished neighborhoods.

Among African American women with early life residence in impoverished areas, the cohort with adulthood residence in affluent neighborhoods has the lowest preterm birth risk. Moreover, this association persists independent of adulthood individual-level characteristics

TABLE 3—Multilevel Logistic Regression Model Results: Illinois Transgenerational Birthfile, Cook County, 1989–1991

Model No.	Characteristic	No.	Residential Environment at Birth/Adulthood	COR (95% CI)	AOR[a] (95% CI)
A1	All infants	19 448 infants, 708 neighborhoods	1st quartile/2nd quartile[b]	0.8* (0.8, 0.9)	0.9 (0.9, 1.0)
			1st quartile/3rd quartile[b]	0.8* (0.7, 0.9)	1.0 (0.8, 1.1)
			1st quartile/4th quartile[b]	0.6* (0.5, 0.8)	0.8* (0.6, 1.0)
A2	Infants of 20- to 35-y-old women who were LBW	2273 infants, 453 neighborhoods	1st quartile/2nd quartile[b]	0.9 (0.7, 1.1)	0.9 (0.7, 1.1)
			1st quartile/3rd quartile[b]	0.8 (0.6, 1.1)	0.8 (0.6, 1.2)
			1st quartile/4th quartile[b]	0.8 (0.4, 1.4)	0.9 (0.5, 1.7)
A3	Infants of 20- to 35-y-old women who were not LBW			0.8* (0.7, 0.9)	0.9 (0.8, 1.0)
			1st quartile/3rd quartile[b]	0.8* (0.7, 1.0)	1.0 (0.9, 1.2)
			1st quartile/4th quartile[b]	0.5* (0.4, 0.7)	0.7* (0.5, 0.9)
B1	All infants	4840 infants, 374 neighborhoods	2nd quartile/3rd or 4th quartile[c]	0.8 (0.7, 1.0)	0.9 (0.7, 1.1)
B2	Infants of 20- to 35-y-old women who were LBW	462 infants, 167 neighborhoods	2nd quartile/3rd or 4th quartile[c]	1.5 (0.8, 2.7)	1.7 (0.9, 3.3)
B3	Infants of 20- to 35-y-old women who were not LBW	3479 infants, 339 neighborhoods	2nd quartile/3rd or 4th quartile[c]	0.7* (0.6, 0.9)	0.8 (0.7, 1.0)

Note. AOR = adjusted odds ratio; CI = confidence interval; COR = crude odds ratio; LBW = low birth weight.
[a]Controlling for maternal birth weight, age, education, parity, marital status, prenatal care utilization, and cigarette smoking.
[b]Referent group = 1st quartile/1st quartile.
[c]Referent group = 2nd quartile/2nd quartile.
*$P < .05$.

and therefore strongly suggests a contextual process. Potential mechanisms include residence in neighborhoods with concentrated affluence, low violent crime rates, and access to quality preventive health care.

Our data provide evidence that African American women who experience lifetime upward mobility from modestly impoverished neighborhoods also have lower rates of preterm birth compared with those with lifelong residence in modestly impoverished neighborhoods. Given the small percentage of African American mothers with lifelong residence in affluent areas,[12] we speculate that relatively small improvements in the economic environment of African American women across the life course can translate into beneficial birth outcomes and consequently narrow the racial disparity in infant mortality rates.

To the extent that maternal LBW is a proxy for epigenetic changes representative of a biological response to neighborhood poverty, our data show that upward economic mobility is unable to reverse the negative impact of LBW on female fetal reproductive programming. We suspect that the mothers (i.e., maternal grandmothers of index births) of our former LBW mothers were chronically stressed because of their impoverishment. Past studies have shown that when women experience stress during their pregnancies, their brains and placentas secrete the stress hormones.[21–23] These stress hormones then pass into the fetal circulation during critical periods of neuroendocrine and hypothalamic-pituitary-adrenal axis development. This outcome could lead to a female infant with a higher stress reactivity later on in life and consequently place her at greater risk for preterm labor when she becomes pregnant.[25] A generational yardstick is needed to fully address the positive impact of upward economic mobility across generations. Because epigenetics do not change DNA per se, we speculate that the reproductive programming physiology of the non–LBW daughters born to formerly impoverished LBW African American women who experience high upward economic mobility by adulthood reverts to normal.

Reflecting the cumulative impact of socioeconomic disadvantages on the health of African American women, a weathering pattern of worsening birth outcomes with increasing maternal age exists among African Americans.[9,31–34] Interestingly, our data show that preterm birthrates do not rise with advancing age among upwardly mobile African American women. Moreover, the association between upward economic mobility over the life course and lower preterm birthrates does not extend to teenage African American mothers. We suspect that this reflects their short duration of residence in nonimpoverished neighborhoods and consequently limited exposure to protective factors over their life course.[7] Neighborhood affluence may take an extended period before it improves the reproductive health of formerly impoverished African American women.

The Illinois transgenerational birth file with appended US Census income data has certain intrinsic limitations. First, our results may not be generalizable beyond Illinois. Second, the data set has a small but demonstrable skew toward more educated women compared with the general birth population of Illinois, which could limit the generalizability of the study's findings. However, the rates of infant outcome in the file are virtually identical to the state as a whole, so the impact of this distortion is minimal.[26] Third, sample size considerations may have limited our ability to delineate an independent association between upward economic mobility and preterm birth among former LBW mothers. Fourth, we could not evaluate the relation of maternal preterm and intrauterine growth restriction to birth outcome because a large percentage of maternal vital records were missing gestational age data.[26] Fifth, economic environment was empirically defined by census tract median family income. Additional objective

markers of economic environment may affect our findings. Sixth, our data set contains no information on duration of early life and adulthood economic environment. However, the measurement of economic context at early life and adulthood is an improvement over previous research because it allows measurement of lifetime upward economic mobility that is not possible with indicators measured only at the time of delivery. Finally, the vast majority of non-Latino White mothers in our data set had a lifelong residence in high-income neighborhoods,[12] and this factor prevented us from examining the impact of lifetime upward economic mobility on the rate of preterm birth among Whites. A previous study found that upward mobility in individual-level income had a protective effect on the rate of LBW for Whites.[13]

African American mothers' upward economic mobility from early life to adulthood is associated with a decreased risk of preterm birth. However, consistent with the fetal programming theory of reproductive outcome, this phenomenon fails to occur among mothers who were themselves born at LBW. ■

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Contributors

J.W.C. originated the study, supervised all aspects of its implementation, and led the writing. K.M.R. assisted with the study and performed data analyses. R.J.D. assisted with the study and led the construction of the data set. All authors helped conceptualize ideas, interpret findings, and review drafts of this article.

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Human Participant Protection

The Children's Memorial Hospital institutional review board approved this study.

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