Black and Immigrant: Exploring the Effects of Ethnicity and Foreign-Born Status on Infant Health

Tiffany L. Green

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By Tiffany L. Green
Virginia Commonwealth University

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For more on the Young Children in Black Immigrant Families research initiative, please visit: www.migrationpolicy.org/cbi.

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Executive Summary

The disproportionately high rates of adverse birth outcomes among Black infants represent an important policy issue in the United States. Although most of the immigrant health literature finds that foreign-born mothers experience superior birth outcomes relative to their counterparts born in the United States, the birth experiences of Black immigrant mothers in particular have received relatively little attention. While the existing evidence suggests that Black immigrants have better birth outcomes, such as lower rates of low birth weight, compared to US-born Blacks, much of this research relies on all-Black samples or fails to utilize appropriate groups — making it difficult to understand how infant health among Black immigrants compares to non-Black immigrants. Moreover, little is known about the patterns of prenatal behaviors among Black immigrants that may contribute to differences in birth outcomes, such as smoking and use of prenatal care.

Using 2000-03 federal vital statistics natality files, this study compares the prenatal behaviors and birth outcomes of non-Hispanic Black immigrant mothers to those of non-Black immigrants and US-born mothers (both Black and non-Black). The birth outcomes examined include: preterm birth, low birth weight, and small for gestational age. Infant mortality is not examined, given that it is now a very rare event in US childbirths. Also analyzed are rates of smoking and prenatal care use — a standard measure of which is the initiation of prenatal care during the first trimester (i.e., first three months) of pregnancy.

I find that although Black immigrant mothers are the least likely of any group, US or foreign born, to smoke, they also have the lowest rates of first-trimester prenatal-care initiation. While Black immigrant mothers are less likely to give birth to preterm or low-birth-weight infants than US-born Black women, they are still more likely to experience adverse birth outcomes than nearly any other US- or foreign-born group. However, neither smoking nor prenatal-care initiation can explain why Black immigrant mothers experience poorer infant health outcomes than their non-Black counterparts.

Black children disproportionately experience adverse health outcomes at birth.

I. Introduction

Poor infant health results in large economic costs to both individuals and to society. One estimate placed the costs of preterm birth at $6 billion in 2001,[1] and there is a wealth of evidence demonstrating that low birth weight[2] is related to adverse health, educational, and labor outcomes from childhood through adulthood.[3] Black[4] children disproportionately experience adverse health outcomes at birth; they are more likely to be born prematurely, have higher rates of low birth weight, and die within the first year of life.[5]

1 Rebecca B. Russell, Nancy S. Green, Claudia A. Steiner, Susan Meikle, Jennifer L. Howse, Karalee Poschman, Todd Dias, Lisa Potetz, Michael J. Davidoff, Karla Damus, and Joann R. Petrini, "Cost of Hospitalization for Preterm and Low Birth Weight Infants in the United States," *Pediatrics* 120, No. 1 (2007): e1–e9.

2 Low birth weight is defined as weighing less than 2,500 grams at birth.

3 Sandra E. Black, Paul J. Devereau, and Kjell G. Salvanes, "From the Cradle to the Labor Market? The Effect of Birth Weight on Adult Outcomes," *Quarterly Journal of Economics* 122, No. 1 (2007): 409–39; Rucker C. Johnson and Robert F. Schoeni, "The Influence of Early Life Events on Human Capital, Health Status, and Labor Market Outcomes over the Life Course," *The B.E. Journal of Economic Analysis and Policy: Advances* 11, No. 3 (2011): 1-55.

4 The report refers to non-Hispanic Black natives (i.e., African Americans) and non-Hispanic Black immigrants as "Black," when describing racial/ethnic categories examined using 2000-03 Vital Statistics Natality Files. Similarly, the study designates non-Hispanic Asians as "Asian" and non-Hispanic whites as "white;"and interchangeably uses "Hispanic" or "Latino."

5 T.J. Mathews and Marian F. MacDorman, "Infant Mortality Statistics from the 2004 Period Linked Birth/Infant Death Data Set" (National Vital Statistics Reports, 55 No. 14, National Center for Health Statistics, Hyattsville, MD, revised June 13, 2007), www.cdc.gov/nchs/data/nvsr/nvsr55/nvsr55_14.pdf.

Over recent years, researchers have noted superior birth outcomes among immigrant mothers compared to those who are native born, regardless of racial/ethnic background. While the literature has mainly focused on infant health outcomes among Mexican-born immigrant mothers,[6] the birth outcomes of Black immigrant mothers have received comparatively little attention. This oversight is problematic, given the increasing proportion of Black immigrants in the US Black population[7] and the fact that foreign-born Black adults tend to have better health outcomes than do their US-born peers.[8]

This oversight is problematic, given the increasing proportion of Black immigrants in the US Black population.

The existing infant health research on Black immigrant mothers finds that women from Africa and the Caribbean have birth outcomes superior to those of US-born Black mothers.[9] However, one major limitation of this literature is that most researchers examine only within-group differences among Blacks[10] or differences between native- and foreign-born mothers,[11] making it difficult to understand how Black immigrants compare to native- and foreign-born non-Blacks. Such points of comparison are crucial if we are to understand whether the birth outcomes of Black immigrant mothers are truly unique, or whether the infant health disparities observed between native-born Blacks and whites are replicated among immigrant populations. While there are suggestive findings that infants born to Black immigrant mothers are still at a relative health disadvantage to non-Black immigrant and US-born mothers, this evidence is based on studies that are limited for various reasons, whether in geographic scope and/or generalizability[12] or because they examine a limited set of infant health outcomes.[13] Lastly, the majority of this literature fails to empirically explore the possibility that prenatal behaviors (such as smoking and use of prenatal care) can systematically differ by nativity, race, and ethnicity — and that these differences may contribute to differences in infant health outcomes.

The purpose of this report is to address each of these shortcomings in the literature. Using the vital statistics natality files of the National Center for Health Statistics (NCHS),[14] I analyze data from the states and district containing the primary East Coast Metropolitan Statistical Areas (MSAs) where black immigrants resided over the period 2000-03.[15] In doing so, I explore two questions: First, are there any differences in first-trimester prenatal-care initiation or smoking incidence among Black immigrants compared to other native- or foreign-born women? Second, are Black immigrants more or less likely than other foreign-born or US-born women to experience adverse infant-health outcomes?

6 Robert Hummer, Daniel Powers, Starling Pullum, G. Gossman, and W. Frisbie, "Paradox Found (Again): Infant Mortality among the Mexican-origin Population in the United States," *Demography* 44 (2007): 441–57.

7 Mary Mederios Kent, "Immigration and America's Black Population," *Population Bulletin* 62, No. 4 (2007): 3-15, www.prb.org/pdf07/62.4immigration.pdf.

8 Gopal K. Singh and Mohammad Siahpush, "All-cause and Cause-specific Mortality of Immigrants and Native Born in the United States," *American Journal of Public Health* 91, No. 3 (2001): 392–99.

9 Richard J. David and James W. Collins, "Differing Birth Weight among Infants of U.S.-born Blacks, African-born Blacks, and U.S.-born Whites," *New England Journal of Medicine* 337, No. 17 (1997): 1209–14; Eugenia K. Pallotto, Jr., James W. Collins, and Richard J. David, "Enigma of Maternal Race and Infant Birth Weight: A Population-based Study of US-born and Caribbean-born Black Women," *American Journal of Epidemiology* 151 (2000): 1080–85.

10 Ibid.

11 Gopal K. Singh and Stella M. Yu, "Adverse Pregnancy Outcomes: Differences Between US- and Foreign-born Women in Major US Racial and Ethnic Groups," *American Journal of Public Health* 86 (1996): 837-43.

12 Arturo Cervantes, Louis Keith, and Grace Wyshak, "Adverse Birth Outcomes among Native-born and Immigrant Women: Replicating National Evidence regarding Mexicans at the Local Level," *Maternal and Child Health Journal* 3, No. 2 (1999): 99–109.

13 Dolores Acevedo-Garcia, Mah-J. Soobader, and Lisa F. Berkman, "The Differential Effect of Foreign-born Status on Low Birth Weight by Race/Ethnicity and Education," *Pediatrics* 115, No. 1 (2005): e20-30.

14 Center for Disease Control and Prevention, National Center for Health Statistics (NCHS), "Vital Statistics Data Available Online," www.cdc.gov/nchs/data_access/Vitalstatsonline.htm.

15 Kent, "Immigration and America's Black Population." The states include Delaware, Florida, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, and Virginia; the District of Columbia is also included.

This study is among the few to directly compare the birth outcomes of Black foreign-born mothers to those of both (1) their US-born Black counterparts and (2) foreign- and US-born non-Black mothers. Moreover, while low birth weight is the most typical marker of poor infant health, other measures of infant health, may better predict poor health outcomes later in childhood. To further develop the literature on the health of Black immigrant children, this report examines preterm birth, low birth weight, and small for gestational age.

The findings from this study suggest that any existing Black health advantage associated with foreign-born status (i.e., nativity) is limited in scope. That is, compared to Black native-born mothers, Black immigrant mothers have lower rates of low-birth-weight children. However, Black foreign-born mothers experience higher rates of preterm birth and are more likely to give birth to children who are small for their gestational age than nearly all other non-Black foreign-born groups.

There is also suggestive evidence that Black foreign-born women may make different choices than native-born Black (and other non-Black) mothers during the prenatal period. For example, Black immigrant mothers have a very low smoking rate — lower than native-born mothers of all races and white foreign-born mothers — which may help to explain why their birth outcomes are better than those of native-born Blacks. However, Black immigrant mothers are the least likely of any group of mothers, native- or foreign-born, to initiate prenatal care during the first trimester of pregnancy — which may lead to a higher incidence of adverse birth outcomes.

This study will proceed as follows: Section II provides an overview of the literature on immigrant mothers and infant health. Section III describes the data and estimation sample, and Section IV contains a discussion of the empirical findings. Section V concludes with further discussion of the implications of the empirical findings, limitations, and plans for future work.

II. Background

A. Birth Outcomes

Over the past few decades, researchers have observed that the birth outcomes found among immigrant mothers in the United States are often superior to those found among their native-born counterparts.[16] Much of the research on immigrant infant-health outcomes has focused on the so-called Mexican paradox. This refers to the observation that Mexican immigrant women typically have superior outcomes to US-born women of Mexican heritage and US-born whites in spite of possessing socioeconomic profiles typically correlated with poor infant health. Many of these socioeconomic indicators, including low educational attainment, low health insurance coverage, and lengthier prenatal-care delay are similar to those found among US-born Blacks.[17]

Comparatively few researchers have studied the birth outcomes of Black immigrants in the United States. While Black immigrant mothers appear to have advantageous health outcomes compared to US-born Blacks, there is little evidence for the existence of a "Black immigrant paradox" analogous to that found among Mexican mothers. In one of the best-known studies examining the birth outcomes of US- and

16 It is important to note that this was not always the case. Infant and child mortality among white immigrants, for example, was far higher than among native-born whites during the late 18th and early 19th centuries. See Jacqueline H. Wolf, "Low Breastfeeding Rates and Public Health in the United States," *American Journal of Public Health* 93, No. 12 (2003): 2000–10; Jeffrey P. Brosco, "The Early History of the Infant Mortality Rate in America: A Reflection upon the Past and a Prophecy of the Future," *Pediatrics* 103, No. 2 (1999): 478–85. See also Nancy S. Landale, Salvador R. Oropesa, and Brenda K. Gorman, *Immigration and Infant Health: Birth Outcomes of Immigrant and Native-Born Women* (Washington, DC: National Academies Press, 1999).

17 D. E. Bender and D. Castro, "Explaining the Birth Weight Paradox: Latina Immigrants' Perceptions of Resilience and Risk," *Journal of Immigrant Health* 2, No. 3 (2000): 155-73; Hummer et al., "Paradox Found (Again)."

There is little evidence for the existence of a "Black immigrant paradox."

foreign-born Blacks, Richard David and James Collins analyze a data set containing all Illinois births in 1980-95 to US-born non-Hispanic whites and Blacks, as well as to immigrants from sub-Saharan Africa.[18] The authors find that after adjustment for prenatal care, smoking, drug use, and other socioeconomic factors, the African-born women had a birth-weight distribution similar to that of US-born white women. They also report that the rates of low birth weight among African immigrant women were higher than those among US whites, but lower than those of native-born Blacks. Other work has found a persistent infant health advantage among specific groups of Black immigrants, such as those from Ethiopia, compared to US-born Black women.[19]

Several studies have also focused their attention on geographic areas with relatively large populations of Black immigrants, including New York City. David Howard et al. explore the relationships among race, foreign-born status, and infant health outcomes in their study of US-born white and Black women and foreign-born women who gave birth in New York City in 1998-2002.[20] The authors find that US-born Black mothers generally had a higher risk of low birth weight and preterm birth than US-born whites and foreign-born Blacks. However, they find the strongest nativity effects among Blacks from South and Central America; mothers who emigrated from these regions had a much lower risk of preterm delivery or low birth weight.

Black immigrant mothers also may have an infant mortality advantage in non-singleton births. Hamisu Salihu et al. find that the twins of US-born Black mothers had a much higher likelihood of dying within the neonatal period than the twins of their foreign-born counterparts.[21] The authors also report that even within the sample of twins (already more likely to be born preterm and at lower birth weights), the children of US-born mothers were more likely to have adverse health outcomes such as low and very low birth weight.

However, other work suggests that the children of Black immigrant women only have an advantage in certain segments of the birth weight distribution. Eugenia Pallotto et al. find that while Caribbean-born Black women have lesser rates of low birth weight than US-born Black women, both groups have equivalent rates of very low birth weight.[22] David and Collins find similar results in a comparison study of African- and US-born Blacks.[23]

Furthermore, there is suggestive evidence that the birth outcomes for Black immigrant women may compare unfavorably to those for non-Black immigrants and some non-Black US-born women. Data from the 2004 US vital statistics natality files suggest that Black foreign-born women have the highest infant mortality rates of all immigrant women, though these statistics do not take into account differences in socioeconomic status, maternal health, or health behaviors.[24] Arturo Cervantes et al. are among the few to directly compare outcomes among native-born and immigrant women.[25] Using a linked data set of Chi-

18 David and Collins, "Differing Birth Weight among Infants."
19 H. Wasse, V. L. Holt, and J. R. Daling, "Pregnancy Risk Factors and Birth Outcomes in Washington State: A Comparison of Ethiopian-born and US-born Women," *American Journal of Public Health* 84 (1994): 1505-07.
20 David L. Howard, Susan S. Marshall, S. Jay, P. Kaufman, and David A. Savitz, "Variations in Low Birth Weight and Preterm Delivery among Blacks in Relation to Ancestry and Nativity: New York City, 1998-2002," *Pediatrics* 118 (2006): e1399–e1405.
21 Hamisu M. Salihu, W. S. Mardenbrough-Gumbs, Muktar H. Aliyu, J. E. Sedjro, B. J. Pierre-Louis, R. S. Kirby, and G. R. Alexander, "The Influence of Nativity on Neonatal Survival of Black Twins in the United States," *Ethnicity and Disease* 15, No. 2 (2005): 276–82.
22 Pallotto, Collins, and David, "Enigma of Maternal Race and Infant Birth Weight."
23 David and Collins, "Differing Birth Weight among Infants."
24 T.J Mathews and M.F. MacDorman, "Infant Mortality Statistics from the 2004 Period Linked Birth/Infant Death Data Set," *National Vital Statistics Report* 55, No. 14 (2007): 1-32, www.cdc.gov/nchs/data/nvsr/nvsr55/nvsr55_14.pdf.
25 Cervantes, Keith, and Wyshak, "Adverse Birth Outcomes among Native-born and Immigrant Women."

cago births in 1994, the authors find suggestive evidence that although Black immigrant women are less likely to have low-birth-weight or preterm infants than Black native-born women, *both* groups still have worse outcomes than native- and foreign-born Latino and non-Hispanic white women. Extending this work, Dolores Acevedo-Garcia et al. use the 1998 vital statistics natality data to compare differences in birth weight across all native- and foreign-born mothers.[26] In contrast to Cervantes et al., they reach the unique conclusion that white immigrant women do not appear to have an immigrant health advantage, but that foreign-born status has the greatest association with better infant health for non-Hispanic Black women, followed by Hispanic women.

B. Prenatal Behaviors

While genetics, maternal health, and the environment play a large part in determining infant health outcomes such as preterm birth and low birth weight, prenatal behaviors and maternal health during pregnancy, including smoking, prenatal care utilization, and stress can also play an important role. The deleterious effects of smoking on infant health outcomes are well established. Both active and passive (i.e., secondhand) smoking during pregnancy are associated with decreased birth weight and higher rates of preterm birth and infant mortality.[27]

Differences in smoking behavior may help, in part, to explain why Black immigrant women tend to have better birth outcomes than their native-born counterparts. Irma Elo and Jennifer Culhane find in a Philadelphia-based study of pregnant Black women that foreign-born women are less likely to report prenatal smoking, drinking, or marijuana use, even after controlling for a number of socioeconomic factors and stressors.[28] Foreign-born mothers were also more likely to report better physical and mental health. The authors suggest that the African-born women in the sample were more likely to have better prenatal health behaviors and health statuses than the Caribbean-born women, but note that the relatively small sample sizes prevented more definitive conclusions in this regard. Howard Cabral et al. also reach similar conclusions in a Boston-based study of US- and foreign-born Black women.[29] The foreign-born Black women in this study were more socioeconomically advantaged and also less likely than their native-born peers to smoke, drink alcohol, or use illicit drugs.

Another potentially important prenatal behavior is use of prenatal care. Policymakers have identified prenatal care, one of the most widely used forms of preventive health care, as a key policy strategy to improve infant-health outcomes in the United States.[30] However, the impact of prenatal care on infant health is somewhat more ambiguous than that of smoking. Researchers have questioned the effectiveness of prenatal care on improving infant-health outcomes, in part because the observed associations between prenatal care and infant-health evidence are often correlated with maternal characteristics. For example, mothers who know that they may have a potentially problematic pregnancy may be more likely to have more prenatal-care visits, leading to a positive statistical association between more frequent prenatal

26 Acevedo-Garcia, Soobader, and Berkman, "The Differential Effect of Foreign-born Status."

27 Vincent W. Jaddoe, E.J. W. Troe, Albert Hofman, Johan Mackenbach, Henriëtte A. Moll, E. A. Steegers, and J. C. Witteman, "Active and Passive Maternal Smoking during Pregnancy and the Risks of Low Birth Weight and Preterm Birth: The Generation R Study," *Pediatric and Perinatal Epidemiology* 22 (2008): 162–71; Gopal K. Singh and Michael D. Kogan, "Persistent Socioeconomic Disparities in Infant, Neonatal, and Postneonatal Mortality Rates in the United States, 1969-2001," *Pediatrics* 119, No. 4 (2005): e928-e939.

28 Irma T. Elo and Jennifer Culhane, "Variations in Health and Health Behaviors by Nativity among Pregnant Black Women in Philadelphia," *American Journal of Public Health* 100, No. 11 (2010): 2185-92.

29 Howard Cabral, Laurence E. Fried, Suzette Levenson, Hortensia Amaro, and Barry Zuckeman, "Foreign-born and US-born Black Women: Differences in Health Behaviors and Birth Outcomes," *American Journal of Public Health* 80 (1990): 70–2.

30 Greg R. Alexander and Milton Kotelchuck, "Assessing the Role and Effectiveness of Prenatal Care: History, Challenges, and Directions for Future Research," *Public Health Rep* 116, No. 4 (2001): 306–16.

care and lower birth weight.[31] However, there is evidence that suggests that prenatal care may reduce the risk of intrauterine-growth restrictions and that estimates of the "mean" effect of prenatal care can hide more important effects at various points in the birth-weight distribution.[32]

Studies suggest that health insurance coverage is a strong determinant of prenatal care utilization and that non-white and foreign-born women are both less likely to have any prenatal coverage and less likely to initiate early prenatal care.[33] Moreover, the evidence regarding differences in prenatal-care utilization among Black women is extremely sparse and reaches mixed conclusions. Cabral et al. note that US- and foreign-born Black mothers have similar patterns of prenatal-care initiation and delay.[34] However, Salihu et al. report that Black immigrant mothers tend to have lower levels of adequate prenatal care than US-born Black women.[35]

Finally, a handful of studies have attempted to quantify differences in stress or exposure to stress that may explain infant-health-outcome differentials between US- and foreign-born Blacks. While few researchers have connected direct, individual-level measures of financial or emotional stress to infant-health outcomes, Elo and Culhane[36] estimate the relationships between material support, objective stress, and prenatal behaviors. The authors find that material support (i.e., social support) is related to improved prenatal behaviors and maternal health — and that foreign-born Black women are less likely than native-born Black women to have access to material support.[37] However, the inclusion of these and other socio-economic factors fails to explain the better prenatal behaviors and health among Black immigrant women compared to Black native-born women.

Other stress-related literature on Black immigrant mothers uses residential segregation as a proxy for environmental or psychosocial stressors. For example, Sue Grady and Sara McLafferty use 2000 New York City vital statistics data to analyze the relationships between segregation and low-birth-weight risk.[38] In their models, high levels of residential segregation are correlated with a higher risk of low birth weight for all Black women. However, when the authors include controls for country of origin, the association between racial segregation and birth weight disappeared for foreign-born women. The authors hypothesize that immigrant Black women may not have resided in poor or highly segregated areas long enough to experience worsened health and that immigrant cultural traits may have served as a buffer against these adverse conditions.

This study builds and improves upon prior work in this area by comparing the prenatal behaviors and birth outcomes of Black immigrants to both their native-born and non-Black immigrant counterparts, using birth data from the East Coast receiving areas where most Black immigrants reside. In addition to estimating models of low birth weight, I also look at preterm birth and infants that are small for their gestational age (a measure that can proxy for intrauterine-growth restriction).[39]

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31 Theodore Joyce, "Self-Selection, Prenatal-Care, and Birth-Weight among Blacks, Whites, and Hispanics in New-York-City," *Journal of Human Resources* 29, No. 3 (1994): 762–94; Mark R. Rosenzweig and Paul T. Schultz, "Estimating a Household Production Function: Heterogeneity, the Demand for Health Inputs, and their Effects on Birth Weight," *The Journal of Political Economy* 91, No. 5 (1983): 723–46.

32 George L. Wehby, Jeffrey C. Murray, Eduardo E. Castilla, Jorge S. Lopez-Camelo, and Robert L. Ohsfeldt, "Quantile Effects of Prenatal Care Utilization on Birth Weight in Argentina," *Health Economics* 18 (2009): 1307-21; K. S. Conway and P. Deb, "Is Prenatal Care Really Ineffective? Or, is the 'Devil' in the Distribution?" *Health Economics* 24 (2005): 489–513.

33 V. Cokkinides, "Health insurance coverage-enrollment and adequacy of prenatal care utilization," *J Health Care Poor Underserved* 12 (4) (2001):461-73; Kathryn Pitkin Derose, Jose J. Escarce, and Nicole Lurie, "Immigrants and Health Care: Sources of Vulnerability," *Health Affairs* 26, No. 5 (2007):1258-68.

34 Cabral et al., "Foreign-born and US-born Black Women.

35 Salihu et al., "The Influence of Nativity on Neonatal Survival."

36 Elo and Culhane, "Variations in Health and Health Behaviors."

37 Elo and Culhane rate levels of material support based on the number of "yes" responses to the following set of questions: "Do you know someone who (1) would take you to the doctor? (2) would loan you $100? (3) would help you with daily chores if you were sick? (4) you could talk to about problems? and (5) would watch your children?" The more "yes" responses, the higher the level of material support recorded. See Elo and Culhane, "Variations in Health and Health Behaviors."

38 Sue C. Grady and Sara McLafferty, "Segregation, Nativity, and Health: Reproductive Health Inequalities for Immigrant- and Native-born Black Women in New York City," *Urban Geography* 28, No. 4 (2007): 377-97.

39 P. Clayton, S. Cianfarani, P. Czernichow, G. Johannsson, R. Rapaport, and A. Rogol, "Management of the Child Born Small for Gestational Age through to Adulthood: A Consensus Statement of the International Societies of Pediatric Endocrinology and the Growth Hormone Research Society," *The Journal of Clinical Endocrinology & Metabolism* 92, No. 3 (2007): 804–10.

III. Description of Data and Analytical Methods

A. Data

For the empirical analyses, this study employs 2000-03 vital statistics natality files from the National Center for Health Statistics.[40] The federal natality files represent the largest available data on Black immigrant births because they provide annual data on every live birth in the United States.[41] The files include information on infant health outcomes, maternal characteristics, and prenatal behaviors.[42] For the purposes of this paper, I restrict the sample to the states and district containing the East Coast metropolitan statistical areas that are home to the most Black (African and Caribbean) immigrants.[43]

Appendix Tables A-1 and A-2 contain descriptive statistics summarizing the key characteristics of the native-born and foreign-born mothers in the sample, by ethnic group. The summary statistics are presented in panels associated with the birth outcomes of interest, prenatal behavior and pregnancy history, maternal characteristics, and year of birth.

This study measures the following infant-health outcomes: preterm birth, low birth weight, and small for gestational age. Compared to infant mortality, these birth outcomes are both more common and vary more substantially across groups, facilitating richer analyses. A preterm infant is any infant born with fewer than 37 weeks of gestation. An infant is classified as low birth weight if she or he weighs less than 2,500 grams at birth. Small-for-gestational-age infants are born at a birth weight below the 10th percentile for their gestational age and gender.[44]

There is substantial variation in the incidence of preterm birth across populations of US- and foreign-born mothers. Overall, foreign-born mothers have lower rates of preterm birth than US-born mothers, 7 percent versus 9 percent (see Table A-1). However, Black immigrant mothers have the highest rates of preterm birth of all foreign-born mothers: 10 percent. In contrast, white immigrant mothers have the lowest rates of preterm birth (5 percent), and Asian and Latino mothers have rates that fall in the middle (7 percent and 6 percent, respectively). Black immigrant women also have roughly equivalent or higher rates of preterm birth than US-born mothers, with the exception of US-born Black mothers, who have the highest rates of preterm birth of any group (12 percent). Among US-born women, white mothers have the lowest rates of preterm birth (7 percent), while Asian and Latino mothers have slightly higher rates of preterm birth (8 percent and 9 percent, respectively).

While the average low-birth-weight rate is nearly equivalent between immigrant and native-born mothers, there are considerable within-group differences in both the native- and foreign-born samples. Among US-born mothers, Black women have the highest incidence of low birth weight in the sample (11 percent), followed by Latino and Asian mothers (7 percent), and white mothers (5 percent). These patterns

40 Geographic identifiers are unavailable in public natality files after 2004.

41 NCHS, "Vital Statistics Data Available Online."

42 I employed the following exclusion criteria when deriving the final estimation sample. First, I excluded all multiple births (n=184,833), those observations without valid values for gender (n=149) and dependent birth outcomes of interest, including birth weight (n=5,510) and gestational age (n=137,515). I also excluded all observations without maternal prenatal behaviors of interest, including prenatal care (n=67,568) and smoking behavior (n=7,435). I also excluded all mothers who failed to report their race/ethnicity (n=51,459) or reported their race/ethnicity as Native American/Pacific Islander mothers, given that they comprised an extremely small proportion (of the sample (n=9,093). Lastly, I excluded mothers with missing information on marital status (n=119) and age (n=839). The final sample, N=3,985,589 is approximately 78 percent of the original sample of all births in the nine states/district mentioned above.

43 Top metropolitan areas of residence for Black immigrants are derived from analysis of 2005 American Community Survey (see Kent, "Immigration and America's Black Population") and include: New York–Northern New Jersey–Long Island (NY-NJ-PA), Miami–Fort Lauderdale–Miami Beach (FL), Washington–Arlington–Alexandria (DC-VA-MD-WV), Boston-Cambridge-Quincy (MA-NH), Philadelphia-Camden-Wilmington (PA-NJ-DE-MD), Orlando-Kissimmee (FL), and Baltimore-Towson (MD). West Virginia is excluded from the analyses, given the very small number of Black immigrants/immigrant births in the state.

44 Clayton et al., "Management of the Child Born Small for Gestational Age through to Adulthood;" Russell et al., "Cost of Hospitalization for Preterm and Low Birth Weight Infants."

are repeated in the foreign-born sample. While foreign-born Black mothers have lower rates of low birth weight than US-born Black women (8 percent versus 11 percent), they nonetheless have the highest rates of low birth weight in the immigrant sample.

The rate of small-for-gestational-age births is also nearly equivalent in both samples (11 percent versus 10 percent in the foreign- and native-born samples, respectively). Among children born to US-born mothers, Black infants are twice as likely to be classified as small for gestational age compared to non-Hispanic whites (16 percent versus 8 percent), with Hispanic and Asian infants falling in between. Among children born to foreign-born mothers, Black infants are more likely to be small for their gestational age than non-Hispanic white or Hispanic infants (13 percent, 10 percent, and 9 percent, respectively) but Asian immigrant mothers have the highest rate of small-for-gestational-age infants (14 percent).

Black women have the highest incidence of low birth weight in the sample.

Prenatal behaviors measured in this study include whether or not the mother ever smoked during pregnancy and whether or not she initiated prenatal care during the first trimester. Unsurprisingly, US-born mothers have much higher smoking rates than foreign-born mothers (9 percent versus 6 percent). White mothers have the highest smoking rates overall (13 percent and 4 percent in the US- and foreign-born samples, respectively). While US-born Black mothers have lower smoking rates than US-born white mothers, they still have higher smoking rates than those of US-born Latino and Asian mothers. In contrast, Black immigrant mothers (along with Asian mothers) have the lowest prenatal smoking rates in the entire sample (1 percent), followed by Latino mothers (2 percent).

I define a mother as having initiated first trimester prenatal care if she visited a health-care provider within the first three months of pregnancy. Consistent with previous literature,[45] immigrant mothers tend to delay prenatal care more than native-born mothers: 83 percent of US-born mothers initiate care in the first trimester compared to 81 percent of foreign-born mothers. Moreover, regardless of nativity, Black mothers are the least likely to initiate care in the first trimester (approximately 75 percent), followed by Latino mothers (approximately 81 percent). White Non-Hispanic mothers, both native and foreign born, are the most likely to initiate care in the first trimester (90 percent and 85 percent, respectively).

Maternal characteristics measured in this study include maternal race/ethnicity and foreign-born status, maternal age, whether a mother has given birth previously, marital status, and educational attainment. Following existing practices in the social sciences literature, each child's race/ethnicity and nativity are based on those of the mother.[46] All children are classified as either second-generation immigrants (mother born outside of the United States) or third- or higher-generation immigrants (native born). Maternal race and ethnicity are divided into eight categories: non-Hispanic white immigrant/native, non-Hispanic Black immigrant/native, Hispanic immigrant/native, and non-Hispanic Asian immigrant/native.

Among the native born, Black and Latino mothers tend to be slightly younger and less well educated than white and Asian mothers and are more likely to be unmarried. Notably, native-born Black mothers have similar levels of schooling as Latino immigrants. While Black immigrant mothers are more likely to be married and have attained higher levels of education than US-born Blacks, they still have lower rates of upper-level schooling (16+ years) and are less likely to be married than white and Asian immigrants. I also include indicator variables for the year of birth; state and county of residence; whether a mother gave birth in an area with a population below 100,000; and the season of birth.[47]

45 Cervantes, Keith, and Wyshak, "Adverse Birth Outcomes among Native-born and Immigrant Women."
46 Because this study is based on US birth records, it by necessity excludes first-generation immigrant children born abroad.
47 Variables for state, county, and state/county population size are not included in the summary regression tables presented in this report but are available upon request.

B. Empirical Approach

While the descriptive statistics suggest that any Black immigrant infant-health advantage may exist only in comparison to US-born Blacks, a number of factors — including the maternal characteristics and geographic variables above — are also associated with birth outcomes. I employ regression-based analyses to explore systematically the associations among race/ethnicity, nativity , prenatal behaviors, and birth outcomes. Each of the prenatal behaviors (smoking, prenatal care) and birth outcomes (preterm, low birth weight, small for gestational age) is a binary outcome, which is estimated using logit regression models.[48]

IV. Results

This section discusses the estimated associations among race/ethnicity, nativity, prenatal behaviors, and birth outcomes, with a particular focus on Black immigrants. To offer a more intuitive interpretation of the regression analyses, I generate model-based predictions of each prenatal behavior and birth outcome for each racial/ethnic group, by nativity.

A. Prenatal Behaviors

1. Smoking

Black, Latino, and Asian mothers are less likely to smoke than white mothers (see Table 1).[49] Immigrant mothers also have substantially lower smoking rates than US-born mothers.[50]

Black immigrant mothers have the *lowest* predicted rates of smoking of all women, 0.8 percent, closely followed by Latino and Asian immigrants (1.0 percent and 1.4 percent, respectively). In contrast, non-Hispanic white US-born mothers are predicted to have the highest smoking rates (16.2 percent). White non-Hispanic immigrant mothers have about half the predicted smoking rates of their native-born counterparts, 7.2 percent, but this rate is still higher than any other racial or immigrant category with the exception of Asian native-born mothers (8.5 percent). Black native-born mothers have the lowest predicted smoking rates of any group of native-born women (6.0 percent). In summary, all Blacks have among the lowest predicted rates of prenatal smoking (a behavior connected with poor infant health outcomes), but smoking abstention is most pronounced among foreign-born Blacks.

48 Smoking and first-trimester care are binary (0/1) variables. I estimated both smoking and first-trimester care initiation as logit models. Independent covariates included: first birth, mother's age, mother's race/ethnicity, immigrant status, mother's race/ethnicity multiplied by mother's immigrant status, 9-11 years schooling, 12 years schooling, 13-15 years schooling, 16+ years schooling, education missing, 2000 birth, 2001 birth, 2002 birth, and 2003 birth. Similarly, preterm birth, low birth weight, and small for gestational age (all binary variables) were estimated using logit models. These models also included the prenatal behaviors as "independent" variables: prenatal care, smoked, first birth, mother's age, mother's race/ethnicity, immigrant status, mother's race/ethnicity multiplied by mother's immigrant status, 9-11 years schooling, 12 years schooling, 13-15 years schooling, 16+ years schooling, education missing, 2000 birth, 2001 birth, 2002 birth, and 2003 birth. The reference categories for these variables in the regression analyses were: mother white, mother white immigrant, less than nine years of schooling, 2004 birth, winter birth, lived in area with population above 100,000, lived in Virginia, and 2003 birth year.

49 Table A-3 in the appendix reports average marginal effects of race/ethnicity, immigrant status, and other factors on smoking and first-trimester prenatal-care initiation. These marginal effects and the predicated outcomes shown in Table 1 are taken from logistic regressions. Average marginal effects reflect the association between a 1-unit change in an independent variable and a 1-unit change in an outcome variable (for example, the impact of having a Black mother on low birth weight.) However, from an empirical standpoint, it is impossible to report the average marginal effect of Black immigrant status because Black immigrant status has two components (Black and immigrant). I report complete estimation results in the form of average marginal effects but to facilitate understanding of the implications of the model, I present predicted probabilities of prenatal behaviors and infant health outcomes, by race/ethnicity and immigrant status, within the body of the paper and in Table 1.

50

Table 1. Predicted Rates of Smoking and First-Trimester Prenatal-Care Initiation by Race/Ethnicity and Nativity, 2000-03 (N=3,985,589)

	Smoking		Prenatal Care	
	Marginal Effect	Standard Error	Marginal Effect	Standard Error
White Native-Born, NH	0.162***	(0.000)	0.881	(0.000)
White Immigrant, NH	0.072***	(0.001)	0.803	(0.001)
Black Native, Native-Born NH	0.060***	(0.000)	0.817	(0.000)
Black Immigrant, NH	0.008***	(0.000)	0.754	(0.001)
Latino, Native-Born	0.050***	(0.000)	0.857	(0.001)
Latino, Immigrant	0.010***	(0.000)	0.812	(0.001)
Asian Native-Born, NH	0.085***	(0.003)	0.826	(0.003)
Asian Immigrant, NH	0.014***	(0.000)	0.767	(0.001)

Notes: NH=Non-Hispanic.
*** indicates significance at the 1 percent level; ** at the 5 percent level, and * at the 10 percent level.
Source: Author's analysis of 2000-03 natality files, National Center for Health Statistics, "Vital Statistics Data Available Online," www.cdc.gov/nchs/data_access/VitalStatsOnline.htm.

2. Prenatal-Care Initiation during the First Trimester

While Black immigrant women have the lowest predicted smoking rates of all groups of mothers — a positive prenatal behavior — they also have the lowest rates of prenatal-care initiation during the first three months of their pregnancy. Indeed, though all immigrants are less likely to initiate care during the first trimester than the native born, Black women are still less likely than white, Latino, and Asian immigrant women to initiate early prenatal care (see Table 1).

Black immigrant mothers have the lowest predicted rate of first-trimester prenatal-care initiation (75.4 percent). Asian immigrants also have a comparably low rate of early prenatal-care initiation (76.7 percent). Latino immigrants have the highest predicted rate of first-trimester care initiation (81.2 percent), followed by non-Hispanic white immigrants (80.3 percent). Although US-born Black mothers have a higher predicted rate of early prenatal-care initiation than foreign-born Blacks (81.7 percent), they are still the least likely of all US-born mothers to initiate early care. White non-Hispanic mothers born in the United States have the highest predicted rate of first-trimester care initiation (88.1 percent), followed by Latino and Asian mothers (85.7 percent and 82.6 percent, respectively). In contrast to smoking behavior, Black mothers tend to fare worse than other mothers with respect to prenatal-care initiation. Since prenatal-care use can be associated with worse birth outcomes (because mothers expecting worse outcomes tend to seek prenatal care), the degree to which lack of early prenatal care is a risk factor for poor birth outcomes among Black immigrant mothers is unclear.

B. Birth Outcomes

1. Preterm Birth

While foreign-born Black women are less likely to give birth to preterm infants than US-born Black women, they are much more likely to do so than non-Black women (see Table 2).[51] Black immigrant women have a lower predicted preterm birth-rate than US-born Blacks (11.2 percent vs. 9.2 percent). However, white immigrants have the lowest predicted rate (5.7 percent), slightly below Latino and Asian immigrants (approximately 6.7percent and 6.8 percent, respectively). Black immigrant women also have a higher predicted preterm-birth rate than nearly all other US-born mothers, including white, Hispanic, and Asian women (whose preterm-birth rates are 6.9 percent, 8.7 percent, and 8.5 percent, respectively).

51 For the marginal effects of race/ethnicity, immigrant status, and other factors on birth outcomes, see Table A-4 in the Appendix.

2. Low Birth Weight

Foreign-born Black women are less likely than US-born Black women to give birth to low-birth-weight infants. However, regardless of nativity, Black women have the highest incidence of low birth weight of any racial/ethnic group. Infants born to Black immigrants have the highest predicted rate of low birth weight of all children of immigrants: 8.2 percent. Only US-born Blacks have a higher rate (10.2 percent). Children of Black immigrants are more likely to be low birth weight than children of non-Hispanic white immigrants (4.4 percent), Hispanic immigrants (5.2 percent), and Asian immigrants (6.8 percent). US-born Black mothers have higher rates of predicted low birth weight than all other groups of native-born non-Blacks.

3. Small for Gestational Age

Finally, birth-outcome patterns change somewhat when looking at rates of infants born small for their gestational age. Asian and Black babies, regardless of the mother's nativity, have relatively high rates of small-for-gestational age. Babies born to non-Hispanic Black immigrant women have a relatively high predicted small-for-gestational age rate of 13.6 percent; only children born to Asian immigrant mothers and Black US-born mothers have higher rates (16.0 percent and 14.9 percent, respectively). Children born to Latino and white mothers fare better on these measures than either Black or Asian children.

Table 2. Predicted Birth Outcomes by Race/Ethnicity and Nativity, 2000-03 (N=3,985,589)

	Preterm Birth (< 37 weeks)		Low Birth Weight (<2500 grams)		Small for Gestational Age (10th percentile)	
	Predicted Rate	Standard Error	Predicted Rate	Standard Error	Predicted Rate	Standard Error
White Native-Born, NH	0.069***	(0.000)	0.047***	(0.000)	0.080***	(0.000)
White Immigrant, NH	0.057***	(0.001)	0.046***	(0.001)	0.095***	(0.001)
Black Native-Born NH	0.115***	(0.000)	0.103***	(0.000)	0.149***	(0.001)
Black Immigrant, NH	0.092***	(0.001)	0.082***	(0.001)	0.137***	(0.001)
Latino, Native-Born	0.087***	(0.001)	0.066***	(0.001)	0.106***	(0.001)
Latino, Immigrant	0.067***	(0.000)	0.052***	(0.000)	0.103***	(0.001)
Asian Native-Born, NH	0.085***	(0.002)	0.073***	(0.002)	0.131***	(0.003)
Asian Immigrant, NH	0.068***	(0.001)	0.068***	(0.001)	0.160***	(0.001)

Notes: Notes: NH=Non-Hispanic.
*** indicates significance at the 1 percent level; ** at the 5 percent level, and * at the 10 percent level.
Source: Author's analysis of 2000-03 natality files, National Center for Health Statistics, "Vital Statistics Data Available Online."

V. Conclusion and Discussion

The findings in this report imply that although Black immigrant mothers tend to have more favorable birth outcomes than their native-born Black counterparts, their birth outcomes are less favorable when compared with those of other racial/ethnic groups — both foreign- and native-born. While disparities in the incidence of preterm birth and low birth weight are largest between Black and white US-born mothers, the differences between Black and white immigrant mothers are nearly as large, particularly in the case of preterm births. These differences are non-trivial. Not only is low birth weight associated with adverse health and human development outcomes,[52] it is the leading correlate of infant mortality among non-Hispanic Black mothers.[53]

52 Black, Devereau, and Salvanes, "From the Cradle to the Labor Market?"; Johnson and Schoeni, "The Influence of Early Life Events."
53 Matthews and MacDorman, *Infant Mortality Statistics from the 2004 Period.*

I find that the predicted rates of small for gestational age are lowest among the infants of native- and foreign-born non-Hispanic white mothers, followed by Latino mothers. The rates of small for gestational age are higher for Black and Asian immigrants. However, a Sweden-based study comparing the rates of small-for-gestational-age infants born to native-born Swedes with those born to immigrants finds that although African and Asian immigrants have higher rates of small-for-gestational-age babies, they do not consequently experience higher rates of mortality.[54] Similarly, a Canadian-based study finds that small-for-gestational-age standards may need to be modified for those of East Asian and Southeast Asian ancestry.[55] A US-based study of non-Hispanic whites and US- and foreign-born Blacks has a contrasting finding: that a single standard measure of small-for-gestational-age is more highly correlated with infant mortality than ethnic-specific measures.[56] Regardless, in the United States, the rates of infant mortality among Black immigrants are at least twice those of Asian immigrants.[57] Thus, an important next step is to extend this work to include both general and race- and ethnicity-specific measures of small for gestational age in models of infant mortality.

Prenatal smoking is also a potentially important reason for variation in birth outcomes between foreign- and native-born Blacks. I find that Black immigrant women often have substantially different prenatal-care-behavior patterns than both their US-born and non-Black foreign-born counterparts. Black immigrant women are much less likely to smoke than US-born Black women. Given the strong relationships between smoking and birth weight, this may explain, in part, why the rates of low birth weight (and to a lesser extent, very low birth weight and small for gestational age) are lower for non-Hispanic Black immigrant women. In contrast, Black women — particularly those who are foreign born — also tend to delay prenatal care, which may lead to more adverse pregnancy outcomes in comparison to non-Black mothers. However, while simulations predict that earlier prenatal-care initiation is associated with improved birth outcomes among all mothers,[58] these improvements are very small.

Neither smoking nor prenatal-care initiation fully explains the greater rates of adverse birth outcomes among Black mothers, regardless of nativity.

In any case, neither smoking nor prenatal-care initiation fully explains the greater rates of adverse birth outcomes among Black mothers, regardless of nativity. Many researchers have hypothesized that the Black-white infant health gap may be related to stressors that disproportionately affect Black women. For example, the weathering hypothesis[59] suggests that stressors related to poverty and discrimination may result in health deterioration and adverse birth outcomes among Black women, compared to white women. In addition, racial disparities in infant health widen with increasing maternal age. However, there is still a need for biological evidence in support of the weathering hypothesis as an explanation for poor Black-infant-health outcomes,[60] and its salience for Black immigrants remains an open question.

54 Finn Rasmussen, Claes Erik Oldenburg, Andres Ericson, and Jan Gunnarskog, "Preterm Birth and Low Birthweight among Children of Swedish and Immigrant Women between 1978 and 1990," *Paediatric and Perinatal Epidemiology* 9, No. 4 (1995): 441-54

55 Joel G. Ray, Depeng Jiang, Michael Sgro, Rajiv Shah, Gita Singh, and Muhammad M. Mamdani, "Thresholds for Small for Gestational Age among Newborns of East Asian and South Asian Ancestry," *Journal of Obstetrics and Gynaecology* Canada 31, No. 4 (2009): 322–30.

56 Michael S. Kramer, Cande V. Ananth, Robert W. Platt, and K. S. Joseph, "US Black Vs White Disparities in Foetal Growth: Physiological or Pathological?" *International Journal of Epidemiology* 35, No. 5 (2006): 1187–95.

57 Mathews and MacDorman, *Infant Mortality Statistics from the 2004 Period.*

58 Results from smoking and prenatal-care simulations available upon request.

59 Arline T. Geronimus, "The Weathering Hypothesis and the Health of African-American Women and Infants: Evidence and Speculations," *Ethnicity and Disease* 2, No. 3 (2011): 207–21.

60 Tiffany Green, "Weathering," in *Encyclopedia of Race and Racism, 2nd edition* (Chicago, IL: American Library Association, forthcoming 2012).

It is important to note that public vital statistics data do not include mother's origin countries except Mexico and Canada. Lack of origin-country identifiers represents a weakness in the federal vital statistics data as there are important differences across origin countries with regard to parental health and educational attainment, characteristics that may also influence birth outcomes.[61] Also, while vital statistics data are useful for examining broad trends across groups, they contain limited information on prenatal behaviors, stressors, or other environmental factors that may affect pregnancy outcomes. Finally, the included measures of prenatal behavior (smoking and prenatal-care utilization) are often strongly correlated with maternal characteristics that also influence pregnancy outcomes — making any discussion of these behaviors descriptive, rather than causal. However, the main findings of this report remain unchanged when measures of smoking and prenatal-care initiation are excluded from infant-health models.[62]

The results of this study provide important evidence that the Black immigrant birth advantage generally occurs only in comparison with Black natives. Meanwhile, second-generation Black immigrant infants are at a health disadvantage compared to non-Black immigrant and non-Black US-born infants. What is particularly telling is that the Black-white infant-health gap observed among US-born Black and non-Hispanic white mothers is also apparent between non-Hispanic Black and white immigrants. Thus, the health and well-being of the children born to Black immigrant mothers has implications for the US Black population. Understanding the socioeconomic mechanisms behind these infant-health disparities remains a topic for further research.

61 Tod Hamilton and Robert Hummer, "Immigration and the Health of U.S. Black Adults: Does Country of Origin Matter?" *Social Science and Medicine* 73, No. 10 (2011): 1551-60.

62 Results from models that exclude smoking and prenatal-care measures available upon request.

Appendices

Table A-1, Birth Outcomes, Prenatal Behaviors, and Maternal Characteristics of Native-Born Women, 2000-03 (N=2,882,426)

	White, NH (n=2,097,612)	Black, NH (n= 566,157)	Latino (n=199,552)	Asian, NH (n=19,105)	All
Birth Outcomes					
Preterm Birth (<37 weeks)	0.07	0.12	0.09	0.08	0.09
Low Birth Weight (<2500 grams)	0.05	0.11	0.07	0.07	0.08
Small for Gestational Age (<10th percentile)	0.08	0.16	0.11	0.12	0.12
Child Male	0.51	0.51	0.51	0.51	0.52
Prenatal Behaviors					
First-Trimester Prenatal-Care Initiation	0.90	0.74	0.80	0.87	0.83
Mother Smoked	0.13	0.10	0.08	0.05	0.09
Maternal Characteristics					
First Birth	0.43	0.40	0.45	0.55	0.46
Mother's Age	29.21	25.27	25.33	28.80	27.15
Non-Hispanic White	---	---	---	---	0.73
Non-Hispanic Black	---	---	---	---	0.19
Latino	---	---	---	---	0.07
Non-Hispanic Asian	---	---	---	---	0.01
Married	0.78	0.28	0.45	0.80	0.58
Schooling					
0 to 8 years	0.01	0.02	0.03	0.01	0.02
9 to 11 years	0.08	0.22	0.25	0.07	0.15
12 years	0.28	0.40	0.31	0.15	0.29
13 to 15 years	0.23	0.23	0.24	0.18	0.22
16+ years	0.39	0.13	0.15	0.58	0.31
Education Missing	0.01	0.01	0.01	0.01	0.01
Year of Birth					
2000	0.26	0.25	0.23	0.23	0.24
2001	0.26	0.25	0.25	0.24	0.25
2002	0.26	0.25	0.25	0.26	0.26
2003	0.22	0.24	0.26	0.26	0.25

Notes: NH=Non-Hispanic. All variables expressed as means.
Source: Author's analysis of 2000-03 natality files, National Center for Health Statistics, "Vital Statistics Data Available Online."

Table A-2. Birth Outcomes, Prenatal Behaviors, and Maternal Characteristics of Foreign-Born Women, 2000-03 (N=1,103,161)

	White, NH (n=207,146)	Black, NH (n=188,671)	Latino (n=485,700)	Asian, NH (n=221,644)	All
Birth Outcomes					
Preterm Birth (<37 weeks)	0.05	0.10	0.07	0.06	0.07
Low Birth Weight (<2500 grams)	0.04	0.08	0.05	0.06	0.06
Small for Gestational Age (<10th percentile)	0.09	0.13	0.10	0.14	0.12
Child Male	0.51	0.51	0.51	0.51	0.51
Prenatal Behaviors					
First-Trimester Prenatal-Care Initiation	0.85	0.75	0.81	0.82	0.81
Mother Smoked	0.04	0.01	0.02	0.01	0.02
Maternal Characteristics					
First Birth	0.45	0.39	0.40	0.49	0.43
Mother's Age	30.24	29.54	27.27	30.10	29.29
White, NH	---	---	---	---	0.19
Black, NH	---	---	---	---	0.17
Latino	---	---	---	---	0.45
Asian, NH	---	---	---	---	0.19
Married	0.88	0.55	0.51	0.89	0.71
Schooling					
0 to 8 years	0.03	0.05	0.22	0.05	0.09
9 to 11 years	0.05	0.11	0.19	0.07	0.11
12 years	0.27	0.37	0.32	0.22	0.30
13 to 15 years	0.21	0.24	0.15	0.17	0.19
16+ years	0.43	0.22	0.13	0.47	0.31
Education Missing	0.01	0.02	0.02	0.01	0.02
Year of Birth					
2000	0.24	0.24	0.23	0.24	0.24
2001	0.25	0.25	0.25	0.24	0.25
2002	0.26	0.25	0.26	0.26	0.26
2003	0.25	0.26	0.26	0.26	0.26

Notes: NH=Non-Hispanic, All variables expressed in means.
Source: Author's analysis of 2000-03 natality files, National Center for Health Statistics, "Vital Statistics Data Available Online."

Table A-3. Marginal Effects of Nativity and Race/Ethnicity on Smoking and First-Trimester Prenatal-Care Initiation, 2000-03 (N=3,985,589)

	Smoked		First-Trimester Prenatal-Care Initiation	
	Marginal Effect	Standard Error	Marginal Effect	Standard Error
Maternal Characteristics				
First Birth	-0.028***	(0.000)	0.050***	(0.000)
Mother's Age	0.002***	(0.000)	0.006***	(0.000)
Mother Black, NH	-0.094***	(0.000)	-0.059***	(0.001)
Mother Latino	-0.100***	(0.000)	-0.014***	(0.001)
Mother Asian, NH	-0.073***	(0.002)	-0.050***	(0.002)
Mother Immigrant	-0.070***	(0.000)	-0.066***	(0.001)
Mother Married	-0.087***	(0.000)	0.068***	(0.000)
Schooling				
9-11 years schooling	0.034***	(0.001)	0.042***	(0.001)
12 years schooling	-0.021***	(0.001)	0.079***	(0.001)
13-15 years schooling	-0.063***	(0.001)	0.113***	(0.001)
16 years+ schooling	-0.171***	(0.001)	0.157***	(0.001)
Education Missing	-0.012***	(0.002)	0.030***	(0.002)
Year of Birth				
2000	0.010***	(0.000)	-0.016***	(0.001)
2001	0.009***	(0.000)	-0.018***	(0.001)
2002	0.004***	(0.000)	-0.013***	(0.001)

Notes: NH=Non-Hispanic.
*** indicates significance at the 1 percent level; ** at the 5 percent level, and * at the 10 percent level.
Source: Author's analysis of 2000-03 natality files, National Center for Health Statistics, "Vital Statistics Data Available Online."

Table A-4. Marginal Effects of Nativity and Race/Ethnicity on Birth Outcomes, 2000-03 Natality Files, (N=3,985,589)

	Preterm Birth (<37 weeks)		Low Birth Weight (<2500 grams)		Small for Gestational Age (<10th percentile)	
	Marginal Effect	Standard Error	Marginal Effect	Standard Error	Marginal Effect	Standard Error
Child Male	0.007***	(0.000)	-0.009***	(0.000)	0.003***	(0.000)
Prenatal Behaviors						
First-Trimester Prenatal-Care Initiation	-0.005***	(0.000)	-0.003***	(0.000)	-0.008***	(0.000)
Mother Smoked	0.024***	(0.001)	0.047***	(0.001)	0.084***	(0.001)
Maternal Characteristics						
First Birth	0.017***	(0.000)	0.025***	(0.000)	0.045***	(0.000)
Mother's age	0.002***	(0.000)	0.001***	(0.000)	0.000***	(0.000)
Black, NH	0.043***	(0.000)	0.051***	(0.000)	0.063***	(0.001)
Latino	0.016***	(0.001)	0.016***	(0.001)	0.022***	(0.001)
Asian, NH	0.015***	(0.002)	0.025***	(0.002)	0.055***	(0.002)
Immigrant	-0.016***	(0.000)	-0.008***	(0.000)	0.007***	(0.001)
Married	-0.012***	(0.000)	-0.013***	(0.000)	-0.013***	(0.000)
Schooling						
9 to 11 years	0.007***	(0.001)	0.005***	(0.001)	0.000	(0.001)
12 years	0.000	(0.001)	-0.002**	(0.001)	-0.008***	(0.001)
13 to 15 years	-0.005***	(0.001)	-0.009***	(0.001)	-0.02***	(0.001)
16+ years	-0.018***	(0.001)	-0.02***	(0.001)	-0.029***	(0.001)
Education Missing	0.009***	(0.001)	0.005***	(0.001)	-0.008***	(0.002)
Year/Season of Birth						
Spring	-0.003***	(0.001)	-0.002***	(0.001)	-0.001	(0.001)
Summer	-0.001	(0.001)	0.000	(0.001)	-0.002*	(0.001)
Fall	-0.004***	(0.001)	-0.002***	(0.001)	-0.001	(0.001)
2000	-0.005***	(0.001)	-0.004***	(0.001)	-0.005***	(0.001)
2001	-0.005***	(0.001)	-0.004***	(0.001)	-0.001	(0.001)
2002	-0.004***	(0.001)	-0.002***	(0.001)	-0.001	(0.001)

Notes: NH=Non-Hispanic.
*** indicates significance at the 1 percent level; ** at the 5 percent level, and * at the 10 percent level.
Source: Author's analysis of 2000-03 natality files, National Center for Health Statistics, "Vital Statistics Data Available Online."

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About the Author

Tiffany Green, a health economist, is Assistant Professor in the Department of Healthcare Policy and Research at Virginia Commonwealth University.

During her time as a Robert Wood Johnson Health and Society Scholar (2007-09) and a Health Disparities Research Scholar (2009-11) at the University of Wisconsin-Madison, Dr. Green continued her research on child health, with a focus on infant health outcomes as well as the intersections between pediatric asthma and obesity.

Dr. Green is a member of the data team for the Dane County Infant Mortality Collaborative, an interdisciplinary initiative created to understand the reasons behind the dramatic improvements in the Black infant mortality rate in Dane County, WI. In this project, she is exploring the role of Medicaid policy on infant mortality and maternal well-being.

She received her PhD in economics from the University of North Carolina at Chapel Hill in 2007. Her dissertation research focused the impact of maternal behaviors on asthma diagnosis and morbidity.

For more on the Young Children of Black Immigrants research initiative, please visit:
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1400 16th Street NW
Suite 300
Washington, DC 20036

Tel: 001 202-266-1940
Fax: 001 202-266-1900