Variation in Birth Outcomes by Country of Birth among Black Women in the United States

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Short Abstract

In this paper, we contribute to the literature on infant health by investigating differentials in birth outcomes (birth weight, prematurity, small-for-gestational age) by country of birth among non-Hispanic black women in the United States in 2008. We expand prior research in several ways. We distinguish foreign-born blacks by country of birth and include more recent data and data from a wider set of states (birth registration areas) than in prior studies. In prior work we have demonstrated that birth outcomes vary among infants born to mothers who immigrated to the United States from the Caribbean and Africa. Our preliminary results further show considerable variation in birth outcomes by the mother's country of birth among Caribbean and African immigrant women. We will explore whether the inclusion of maternal socio-demographic characteristics, health behaviors and maternal health help explain these differentials. No prior study to our knowledge has examined variation in birth outcomes of black immigrants by the mother's country of birth, including the major sending countries of black immigrants to the United States.

Extended Abstract

In this paper, we contribute to the literature on infant health by investigating differentials in birth outcomes (birth weight, prematurity, small-for-gestational age) among infants born to non-Hispanic black women by the mother's country of birth in comparison to infants born to native-born non-Hispanic black women. We include in this analysis the major sending countries of black immigrants from Sub-Saharan Africa and the Caribbean. Much of the prior research on native and foreign-born differentials in infant health has focused on Hispanics—and within this ethnic group the focus has been mainly on Mexicans and Puerto Ricans (Acevedo-Garcia, Soobader, and Berkman 2007; Buekens et al. 2000; Hummer et al. 2007; Landale and Oropesa 2001). Far fewer studies have examined native born and foreign born differentials among black U.S. residents and most of these studies have not distinguished foreign born blacks by country of birth (Acevedo-Garcia, Soobader, and Berkman 2005; Baker and Hellerstedt 2006; Hummer et al. 1999). Those that have, have been limited to select cities or states (e.g., Cabral et al. 1990; Elo, Vang and Culhane 2011; Howard et al. 2006; Wasse, Holt, and Daling 1994).

What makes the study of infant health outcomes among the foreign born of particular interest at this time is the growing diversity among immigrants who came to the United States in the last 30 years. Growing diversity among the sending countries is also evident among black immigrants. Early waves of black immigrants following the 1965 immigration reform came mainly from the Caribbean with a more recent increase in immigration from Africa (Kent 2007). The growth in black immigration is reflected in the percentage of black U.S. residents who are foreign born – up from less than one percent in 1960 to eight percent in 2005 (Iceland 2009; Kent 2007; Logan and Deanne 2003).

This paper expands prior research in several ways. We distinguish foreign-born black infants by the mother's country of birth and include data from a wider set of states (birth registration areas) than in prior studies. Many of these states are new destination areas of black immigrants. We will examine whether birth outcomes vary among the foreign-born blacks by the mother's birth place and whether individual-level socio-demographic characteristics, health behaviors, and maternal health explain these differentials. In addition, we use more recent data than what have been used in prior studies. In these analyses we included births to mothers who immigrated to the United States from major sending countries located in Sub-Saharan Africa and the Caribbean.

Together the above analyses will improve our understanding of the contribution of race/ethnicity and mother's country of birth to variation in infant health outcomes among black U.S. residents and help identify areas for future research.

Data and Methods

Birth records are one of the principal data sources for the study of birth outcomes in the United States and have been widely used for this purpose in prior studies (e.g., Alexander et al. 2007; Buka et al. 2003; Hummer et al. 1999; Morenoff 2003; Sastry and Hussey 2003;). We will base our analysis on 2008 vital statistics birth record data from states that have implemented the 2003 revision of the US birth certificate. Only the 2003 revised birth record data includes information on the mother's country of birth. We have obtained IRB approval for this study from the Institutional Review Board of the University of Pennsylvania. We also obtained approval from the National Association for Public Health Statistics and Information Systems (NAPHSIS) for information on the mother's country of birth. These data were provided to us by the National Center for Health Statistics (NCHS).

Based on preliminary tabulations, there were 599,536 births to non-Hispanic black women residing in the 50 states and the District of Columbia in 2008. The 2003 revision of the U.S. birth certificate was used for 58.2% (348,733) of these births; 85.1% (296,787) were born to native-born mothers; 13.8% (48,057) to foreign-born mothers, and for 1.1% (3,878) of the births the mother's birth country was missing. Among the foreign-born,

47.8% (22,952) of the infants were born to women whose birthplace was in the Caribbean and 38.6% (18,549) were born to women whose birthplace was in Sub-Saharan Africa.

In this paper, we include births to mothers who were born in the large sending countries in the Caribbean – Haiti (9,632) and Jamaica (8,028) – representing 76.9% of all births born to women whose country of birth was in the Caribbean; and births to mothers from the 5 large sending countries in Sub-Saharan Africa – Nigeria (3,607), Somalia (2,360), Ethiopia (2,246), Ghana (1,616), and Kenya (1,039) – representing 58.6% of all births born to women whose country of birth was in Sub-Saharan Africa. In addition, we include births to native-born non-Hispanic Black women (296,787). The final sample, after excluding cases with missing information on outcome and explanatory variables, is 309,020 births.

Birth Outcomes

We will examine differences in three birth outcomes that have been the subject of recent studies: preterm birth (e.g., Messer et al. 2006; Reagan and Salsberry 2005) and small-for-gestational age births (e.g., Elo et al. 2008). Preterm birth is defined as gestational length < 37 weeks; we define SGA based on sex- and parity-specific SGA cut-points (Elo et al. 2008). Both are key risk factors for infant mortality, morbidity, and developmental outcomes and the reduction in their prevalence is a key health priority of the U.S. government (Hummer 1993; Schoendorf et al. 1992). Although SGA captures delayed growth across the entire birth weight distribution, we also model birth weight in its continuous form which, when adjusted for gestational age, is also related to intrauterine growth retardation (IUGR) (e.g., Buka et al. 2003, Sastry and Hussey 2003; Morenoff 2003). Furthermore it allows us to model variation in birth weight across the entire birth weight distribution. This specification also has statistical advantages over the relatively rare dichotomous outcomes – SGA and preterm birth – which can lead to a loss in statistical power.

Individual-level Characteristics

We include several individual-level characteristics. We have categorized women according to their place of birth as follows: native-born, women born in the five African countries – Ethiopia, Ghana, Kenya, Nigeria, and Somalia – and two Caribbean countries – Haiti and Jamaica. In addition to mother's place of birth, we include the following maternal socio-demographic characteristics: maternal age, education, and marital status, and two child-specific characteristics: birth order and child's sex. In addition, we examine the role of the following more proximate determinants of birth outcomes available on the birth record, namely smoking, prenatal care and maternal risk factors. We measure prenatal care (PNC) by when the mother started prenatal care: 1st trimester, after the first trimester, no prenatal care, or prenatal care information was missing. Smoking during pregnancy, a well-known risk factor for adverse birth outcomes, is included as a dichotomous explanatory variable. Information on smoking is missing for large fraction of births that occurred in Florida, Georgia and Michigan. As measures of medical risk factors we include dichotomous measures of whether the mother had chronic or pregnancy-induced hypertension or diabetes, and whether she had a previous poor pregnancy outcome (i.e., preterm birth, SGA birth, or perinatal death).

Preliminary Results

As seen in Table 1, birth outcomes varied substantially among black women by country of birth in 2008. In general, the mean birth weight was highest among infants born to women whose birthplace was in one of the Sub-Saharan African countries, ranging from 3,229 grams (Ghana) to 3,422 grams (Ethiopia) followed by infants born to women whose birth place was in Haiti (3,183 grams) or in Jamaica (3,196 grams). The lowest mean birth weight was recorded for infants of native-born non-Hispanic black women (3,100 grams). These results are consistent with prior studies that have documented higher birth weights for infants born to immigrants from Africa than the Caribbean and lowest birth weights for infants of native-born non-Hispanic black mothers (Elo, Vang, and Culhane 2011).

Similarly, African-born black women in general were least likely to have a preterm birth, although there was also considerable variability among infants born to women from the five Sub-Saharan African countries. Among

these women, the lowest preterm birth rate was recorded for infants born to women who themselves were born in Ethiopia (5.6) and highest for infants born to women whose birthplace was Ghana (10.4). In fact, the likelihood of a preterm birth was similar among infants born to women who themselves were born in Ghana or in Haiti (10.8) and Jamaica (10.8). Nevertheless, all foreign-born non-Hispanic black women were less likely to have a preterm birth than native-born non-Hispanic black mothers (12.4). We find a largely similar pattern by country of birth for small-for-gestational age births (Table 1).

Maternal characteristics also varied by mother's place of birth. The foreign-born mothers were older on average than the native-born mothers and they were more likely to be married. There was considerable variability in the level of education among the foreign-born by mother's country of birth, such that the women born in Somalia had the lowest average level of schooling, whereas women born in Haiti had similar levels of education than native-born non-Hispanic black women. Among the foreign-born, women who were born in Nigeria were the most highly educated. The foreign-born women were much less likely to have smoked during pregnancy than the native-born mothers. Interestingly the foreign-born women were more likely to have been diagnosed with diabetes than the native born, whereas this pattern was not consistent for hypertension. Previous poor birth outcome was also most common among native-born non-Hispanic black women, followed by women born in Ghana, Somalia and Haiti.

Next Steps

We will explore to what extent the maternal characteristics help explain the variation recorded in birth outcomes discussed above. In prior work we have shown that much of the foreign-born advantage in birth outcomes was concentrated among poorly educated mothers. We will further explore whether these interactions are also present by mother's country of birth. In addition, we will explore interactions between other maternal characteristics and mother's country of birth.

In addition, relatively few studies have systematically examined factors that contribute to differentials in birth outcomes among the various foreign born subgroups, e.g., non-Hispanic whites, non-Hispanic blacks, Hispanics and Asians (Fuentes-Afflick, Hessol, and Perez-Stables 1998; Hummer et al. 1999). In supplementary analysis, we will broaden the scope of the analysis by examining differentials among the foreign born by race/ethnicity, i.e., among foreign-born non-Hispanic whites, foreign born non-Hispanic blacks, Hispanics and Asians by country/region of birth. The inclusion of all four race/ethnic groups will enable us to examine the interaction between race/ethnicity and mother's place of birth among the foreign born, which can shed additional light on factors that may explain the observed differentials in birth outcomes among native-born and foreign-born black women.

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Table 1: Birth Outcomes by the Mother's Country of Birth among Non-Hispanic Black Women in the United States, 2008[a]

Birth Outcomes	Native Born (N=281,859)	Sub-Saharan Africa Born					Caribbean Born	
		Ethiopia (N=2,093)	Ghana (N=1,503)	Kenya (N=1,001)	Nigeria (N=3,435)	Somalia (N=2,093)	Haiti (N=9,259)	Jamaica (N=7,777)
Birth Outcomes								
Mean birthweight in grams	3099.7	3421.8	3229.0	3325.9	3358.3	3320.8	3182.7	3196.0
% preterm birth (< 37 wks gestation)	12.4	5.6	10.4	6.4	7.7	6.1	10.8	10.8
% small for gestational age (sga)	17.3	8.2	12.4	9.7	8.5	12.7	14.1	11.8

[a.] 2003 revision of the US Standard Birth Certificate

Table 2: Maternal and Infant Characteristics by the Mother's Country of Birth among Non-Hispanic Black Women in the United States, 2008[a]

Maternal and Infant Characteristics	Native Born (N=281,859)	Sub-Saharan Africa Born					Caribbean Born	
		Ethiopia (N=2,093)	Ghana (N=1,503)	Kenya (N=1,001)	Nigeria (N=3,435)	Somalia (N=2,093)	Haiti (N=9,259)	Jamaica (N=7,777)
Sociodemographic Characteristics								
Maternal Age								
< 20 years	19.2	0.9	1.1	1.6	0.6	5.5	3.8	4.3
20-24 years	33.9	10.5	7.0	8.5	5.1	26.8	14.2	18.9
25-29 years	24.8	27.3	27.7	29.0	24.8	30.1	27.1	26.8
30-34 years	13.9	36.6	34.9	38.7	38.5	20.5	29.3	26.1
35+ years	8.3	24.8	29.4	22.3	31.0	17.2	25.6	23.9
Mother's Education								
Less than high school	23.5	15.8	10.1	2.6	2.7	60.1	24.1	11.2
High school/GED	35.1	41.3	31.5	15.9	15.1	25.8	36.1	30.3
Some college	30.8	28.1	30.5	43.3	26.3	11.3	28.2	36.4
College graduate	10.7	14.9	27.8	38.3	55.9	2.9	11.5	22.2
Marital Status								
Married	23.2	69.3	60.2	70.2	84.8	78.2	58.5	45.2
Not Married	76.9	30.7	39.9	29.8	15.2	21.8	41.5	54.8
Birth Order								
First birth	41.0	44.2	37.1	49.0	34.4	23.6	37.0	40.7
Birth Order 2+	59.0	55.8	62.9	51.1	65.7	76.4	63.0	59.3
Child's sex								
Female	49.1	49.5	48.8	49.3	49.3	48.8	48.2	49.9

[a.] 2003 revision of the US Standard Birth Certificate

Table 2: Maternal and Infant Characteristics by the Mother's Country of Birth among Non-Hispanic Black Women in the United States, 2008[a], continued

Maternal and Infant Characteristics	Native Born (N=281,859)	Sub-Saharan Africa Born					Caribbean Born	
		Ethiopia (N=2,093)	Ghana (N=1,503)	Kenya (N=1,001)	Nigeria (N=3,435)	Somalia (N=2,093)	Haiti (N=9,259)	Jamaica (N=7,777)
Health Behaviors								
Smoked during pregnancy [b]								
Yes	10.2	0.9	0.0	0.6	0.1	0.5	0.5	0.8
Prenatal Care								
Yes, Began in 1st Trimester	55.5	55.2	58.0	56.8	54.2	47.2	51.9	62.3
Yes, Began after 1st Trimester	33.2	35.0	31.8	35.6	35.3	42.1	38.0	30.4
No Prenatal Care	3.1	1.5	1.9	1.5	1.8	3.2	2.6	1.7
Unknown or Not Stated	8.2	8.3	8.3	6.1	8.7	7.5	7.5	5.6
Medical Risk Factors								
Hypertension – yes	7.1	4.2	6.7	3.9	5.6	3.2	7.1	6.5
Diabetes - yes	4.1	6.4	8.0	4.7	5.5	6.3	6.6	6.5
Previous poor birth outcome[c]	7.0	2.9	4.8	2.9	3.9	4.9	3.3	4.9

[a.] 2003 revision of the US Standard Birth Certificate
[b.] Among women for whom information for smoking was not missing. Smoking information was missing for all the births that occurred in Florida, Georgia and Michigan.
[c.] Among women with a prior live birth.