Physician Race/Ethnicity and African American Women's Reproductive Health

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African American women in the United States are 3.4 times more likely to die during pregnancy, 2.3 times more likely to have a fetal loss, and 1.6 times more likely to have a preterm birth when compared with non-Hispanic (NH) white women (Bryant et al. 2010). Research to date suggests that a combination of genetics, neighborhood characteristics, socioeconomic conditions, psychological stress, maternal obesity, and undetected maternal infections may contribute to this alarming racial disparity (Giurgescu et al. 2013; Klebanov, Evans and Brooks-Gunn 2014; Carter et al. 2013; Kothari et al. 2016; Frey et al. 2016).

Though important, none of the aforementioned factors fully explain racial differences in reproductive health. Research on racial disparity in the healthcare system more generally has studied how unintended physician bias can adversely impact clinician decisions and communication, suggesting that a diverse physician workforce may lessen disparate outcomes (Chapman, Kaatz and Carnes 2013; Cooper et al. 2012). Other research has indicated that minority patients have less trust for physicians who do not share their race/ethnicity or language, impacting adherence to proscribed health regimes (Stepanikova et al. 2006; Trayler et al. 2010). In a recent study that used an experimental design, Alsan, Garrick and Graziani (2018) found that African American patients are more likely to discuss health ailments when paired with an African American doctor and that African American doctors were more likely to write notes about African American patients than physicians of a different race or ethnicity. These findings suggest that physician race or ethnicity is a factor worth considering when investigating the racial disparity in African American women's reproductive health outcomes.

We use a population-wide dataset from New Jersey (NJ) with information on individual births, hospitals, and physicians to evaluate the potential effects of physician race/ethnicity on racial disparities in maternal and infant health outcomes. Our study focuses on the following question: To what extent is the race/ethnicity of the treating physician associated with African American women's reproductive health outcomes? We have two hypotheses. Hypothesis I: African American physicians are better able to detect and diagnose reproductive health conditions for which African American patients are at a high risk than physicians of a different race or ethnicity. Hypothesis II: African American patients paired with an African American physician will be less likely to experience poor health outcomes for conditions for which some of the possible causes are preventable, compared to African American patients paired with a physician of a different race or ethnicity. Our rationale is, first, that white physicians may lack familiarity with medical risks uniquely prevalent amongst minority groups and therefore are less adept at diagnosing medical conditions for African American patients. Second, African American patients may be more comfortable disclosing health concerns to African American physicians than physicians of a different race or ethnicity. Finally, African American patients may be more likely to avoid discrimination when paired with an African American physician than with a physician of a different race or ethnicity.

Data
Our primary source of data is the NJ Electronic Birth Certificate and Perinatal Database (EBC). We linked the EBC to statewide mothers' and infants' hospital discharge records between the years of 1997 to 2011 using probabilistic matching. The birth records provide information on method of delivery, gestational age, maternal medical risk factors, labor and delivery complications, demographic variables,

health insurance type, maternal prenatal behaviors, and delivery date. Discharge record variables of interest include discharge diagnoses and procedures, and most importantly for this current project, the first and last names of the attending physicians.

With the data on physicians' last names, we derive the probability that a physician belongs to an ethno-racial group using information from the Census Bureau's lists of the 1000 most frequently occurring surnames. The lists contain information on the percent of Non-Hispanic white, Non-Hispanic African American, Asian or Pacific Islander, American Indian or Alaskan Native, two or more races and Hispanic or Latino who have last name in the lists. We matched the Census Bureau's 2000 and 2010 lists of frequently occurring surnames to the physician's surnames in the 1997-2005 and 2006-2011 EBC data, respectively.

Key Measures

Physician race/ethnicity. Figure 1 shows the probability distribution of among African American patients having a physician who is African American, based on our linkage to the Census Bureau's list of 1000 most frequently occurring surnames. Figure 1 excludes patients with a less than 10% chance their physician is African American. It shows that there are few distinctively African American last names among our data. Therefore, we use the continuous probability as our measure of physician's race/ethnicity.

Figure 1. Distribution of the Probability the Physician and Patient are of the Same Race for African American Patients when Probability>10%, New Jersey 1997-2011

kernel = epanechnikov, bandwidth = 1.6141
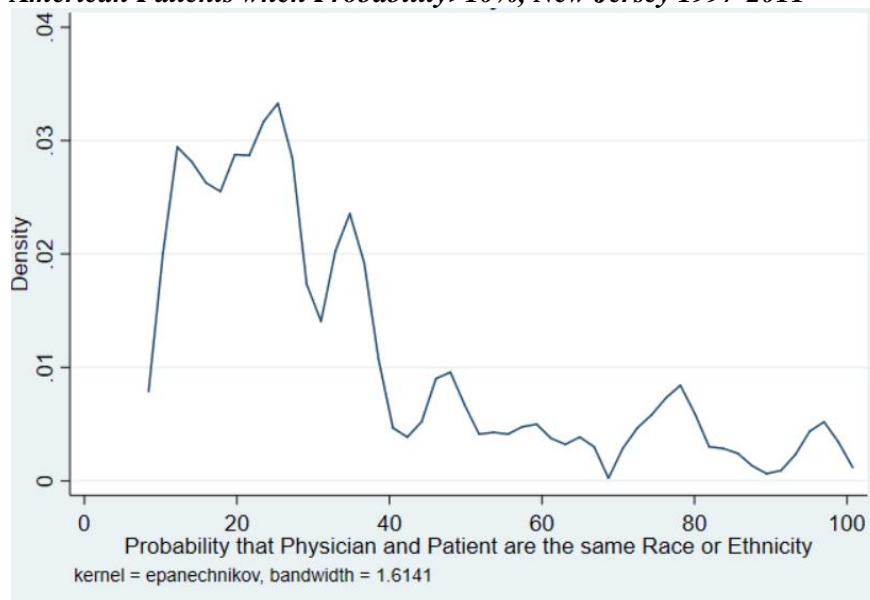
Control variables. Delivery method (c-section, vaginal, induced c-section, and induced vaginal, with non-induced vaginal as the reference category), weeks of gestational age, mother's education, mother's marital status, Medicaid status, whether mother is foreign born, sex of child, trimester mother initiated prenatal care, parity, plurality, and whether mother smoked during pregnancy.

Outcome variables. Our project will examine a range of health conditions and outcomes for which African American women and their infants are at a particular high risk, including preeclampsia, placental abruption, premature birth, fetal loss, neonatal mortality and low birth weight. Below, we present preliminary results for the following outcomes: preeclampsia, prolonged labor, maternal death, low birthweight, fetal distress and infant jaundice.

Sample

        We restrict our sample to births to African American mothers for a total of 263,022 cases.

Table 1. Incidence of Conditions for African American patients, New Jersey 1997-2011

	Preeclampsia	Prolonged Labor	Maternal Death	Low birthweight	Fetal Distress	Infant Jaundice
Yes	6,364	5,049	27	35,274	25,181	5,485
No	256,658	257,973	262,995	227,748	237,841	257,537

Statistical Analysis

        We use logistic regression to estimate the extent to which the treating physician's race/ethnicity is associated with African American women's reproductive health outcomes.

Preliminary Results

Table 2. Preliminary Results for African American Women's Reproductive Health, New Jersey 1997-2011

	Model 1: Preeclampsia	Model 2: Prolonged Labor	Model 3: Maternal Death	Model 4: Low birthweight	Model 5: Fetal Distress	Model 6: Infant Jaundice
African American Physician	1.002* (0.0007)	1.002** (0.0008)	0.983 (0.016)	1.0006 (0.0004)	0.998*** (0.0004)	0.996*** (0.0009)
N	144,782	144,792	79,026	144,792	144,792	144,792
Pseudo R^2	0.107	0.037	0.041	0.305	0.126	0.117

*$p<0.05$, **$p<0.01$, ***$p<0.001$.
Note: Coefficients represented as odds ratios. P-value in parentheses. All models control for the effects of covariates listed in the Key Measures section.

        Results from Model 1 and 2 indicate that African American mothers' odds of being diagnosed with preeclampsia or prolonged labor increases as the probability that the treating physician is African American increases. In Models 3 and 4, there is no statistically significant association between probability that the treating physician is African American and African American women's odds of maternal death or having a low birthweight infant. Models 5 and 6 indicate that African American mothers' odds of fetal distress during labor and incidence of infant jaundice decrease as the probability that the treating physician is African American increases.

        In summary, our results provide support that the matching of physicians and patients race/ethnicity could affect conditions that are more prevalent among African American patients. This paper will also take into consideration the first name of the physician for greater precision in approximating physician race/ethnicity, physician's gender, institutional factors, and control conditions that we should not expect physician or other institutional factors to affect.

Limitations. The physician race/ethnicity measure is probabilistic. Self-reported patient race/ethnicity may also contain errors. The attending physician on record may not be the same as the physician that handled prenatal care, and ethnic minorities may change physicians more frequently than NH whites, thus misclassification of physician's race/ethnicity may be more prevalent among the minority populations than the Non-Hispanic white population.

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