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Early Elective Delivery Disparities between Non-Hispanic Black and White Women after Statewide Policy Implementation

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A B S T R A C T

Background: In 2011, Oregon implemented a policy that reduced the state's rate of early (before 39 weeks' gestation) elective (without medical need) births.
Objective: This analysis measured differential policy effects by race, examining whether Oregon's policy was associated with changes in non-Hispanic Black–White disparities in early elective cesarean and labor induction.
Methods: We used Oregon birth certificate data, defining prepolicy (2008–2010) and postpolicy (2012–2014) periods, including non-Hispanic Black and White women who gave birth during these periods (n = 121,272). We used longitudinal spline models to assess policy impacts by race and probability models to measure policy-associated changes in Black–White disparities.
Results: We found that the prepolicy Black–White differences in early elective cesarean (6.1% vs. 4.3%) were eliminated after policy implementation (2.8% vs. 2.5%); adjusted models show decreases in the odds of elective early cesarean among Black women after the policy change (adjusted odds ratio, 0.47; 95% confidence interval, 0.22–1.00; p = .050) and among White women (adjusted odds ratio, 0.79; 95% confidence interval, 0.67–0.93; p = .006). Adjusted probability models indicated that policy implementation resulted in a 1.75-percentage point narrowing (p = .011) in the Black–White disparity in early elective cesarean. Early elective induction also decreased, from 4.9% and 4.7% for non-Hispanic Black and non-Hispanic White women to 3.8% and 2.5%, respectively; the policy was not associated with a statistically significant change in disparities.
Conclusions: A statewide policy reduced racial disparities in early elective cesarean, but not early elective induction. Attention to differential policy effects by race may reveal changes in disparities, even when that is not the intended focus of the policy.

Racial disparities in birth outcomes are stark and have remained largely unchanged for more than a century (Bryant, Worjoloh, Caughey, & Washington, 2010; Elder, Goddeeris, Haider, & Paneth, 2014; Grobman et al., 2015; Lu & Halfon, 2003). The largest, most consistent racial disparities occur when comparing non-Hispanic Black and White women and their infants. Non-Hispanic Black women have substantially higher rates of maternal mortality, morbidity, and preterm birth, compared with non-Hispanic White women (Callaghan, Creanga, & Kuklina, 2012; Howell, Egorova, Balbierz, Zeitlin, & Hebert, 2016a) and their infants are at higher risk of complications and death (Elder et al., 2014). There are also racial disparities in care during childbirth, including differences that do not

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seem to be driven by these noted differences in maternal morbidities. For example, non-Hispanic Black women have higher rates of cesarean delivery than non-Hispanic White women (Bryant et al., 2010), including cesarean without a medical indication (Huesch & Doctor, 2015), but potentially lower rates of induction of labor without medical indication (Kozhimannil, Macheras, & Lorch, 2014), compared with non-Hispanic White women. Differences in cesarean use or labor induction, including differences not driven my medical need, may contribute to racial disparities in neonatal and maternal outcomes. This potential association may be driven by timing of procedure use, overuse, underuse, or misuse.

The use of obstetric procedures during childbirth is increasingly common in the United States. In 2014, the percentage of cesarean births was 32.2% and the percentage of births that involved labor induction reached 22.8% (Martin, Hamilton, & Osterman, 2015). The overuse of obstetric procedures is a growing concern, and the American College of Obstetrician and Gynecologists and the Society for Maternal-Fetal Medicine have developed a consensus statement on safe reduction of cesarean use, focusing on cesarean births that are elective, or performed without a clear medical need (Caughey, Cahill, Guise, & Rouse, 2014). The use of cesarean delivery may be "elective" (i.e., performed without medical indication), and/or the early term timing of cesarean delivery may be elective (i.e., 37 or 38 weeks' gestation, but with a medical indication, such as breech fetal presentation), but either may affect the chances of adverse neonatal outcomes. Infants born in the early term period—via labor induction or cesarean delivery—are at increased risk of mortality, respiratory distress syndrome, and admission to the neonatal intensive care unit (Parikh et al., 2014; Sengupta et al., 2013). Both the clinical management and the outcomes of early elective delivery differ by mode of initiation (labor induction or cesarean). In particular, early elective cesarean delivery is associated with specific adverse outcomes for infants, doubling the risk for infant respiratory distress or need for ventilation (Tita et al., 2009).

Black–White differences in early elective delivery have been recognized, with non-Hispanic Black women having a 30% higher odds of early elective cesarean, compared with non-Hispanic White women (Kozhimannil et al., 2014). Differences in early elective delivery are much less clearly and consistently documented for other racial or ethnic groups (e.g., Hispanic, Asian, American Indian) compared with White women, which is why we focus on Black–White differences in this analysis (Bryant et al., 2010).

The strong evidence of associated harms explains why efforts targeting early elective deliveries have become a clinical and policy priority. Recent initiatives by the Joint Commission, the National Quality Forum, the Leapfrog Group, March of Dimes, and the Centers for Medicare and Medicaid Services have focused on reducing or eliminating early elective births (Fowler, Schiff, Applegate, Griffith, & Fairbrother, 2014; Main, 2009). These broad, national initiatives have been bolstered by policy efforts at hospitals (Ehrenthal, Hoffman, Jiang, & Ostrum, 2011), within health systems (Oshiro, Henry, Wilson, & Branch, 2009), and at the state level (Donovan et al., 2010; Snowden et al., 2016). To date, racial disparities have not been a focus of these policy initiatives (Fowler et al., 2014).

Oregon's 2011 statewide policy on early elective deliveries, described in detail elsewhere, effectively prohibited elective inductions and cesarean deliveries before 39 weeks' gestation, and resulted in a steep decrease in their use (Snowden et al., 2016). The policy was devised by the Oregon Perinatal Collaborative, implemented by hospitals across the state on a rolling basis throughout 2011, and designed as a "hard-stop" (i.e., an administrative prohibition rather than a "soft-stop," which leaves more discretion to providers; Clark, Frye, & Meyers, 2010). It effectively prevented early elective deliveries by requiring review and administrative approval for any scheduled labor induction or cesarean delivery without a documented medical indication before 39 weeks' gestation. The policy was implemented at the hospital level and was expected to affect all women who were candidates for early elective delivery equally, regardless of individual factors such as insurance status and race/ethnicity. Although the Oregon hard-stop policy was not designed explicitly to target non-Hispanic Black–White disparities, there is now strong evidence suggesting that policy implementation may affect population subgroups differentially, with implications for disparities (Lorenc, Petticrew, Welch, & Tugwell, 2013).

In the context of a broad, statewide policy, we aimed to understand whether racial disparities existed before policy implementation and if the policy's adoption affected outcomes differently for non-Hispanic Black and White women. In addition to their potential impact on overall population health, policies may affect disparities in health outcomes (Frohlich & Potvin, 2008). Public health interventions may be targeted at the general population, at vulnerable populations, or both simultaneously, and policies in any of these categories may act to increase or decrease disparities (Purnell et al., 2016). It is, therefore, critical to understand how policies affect not just population health, but also racial subgroups and disparities between them, to design and implement policies that are both effective and equitable. This analysis measured the differential effects of policy implementation by race, examining whether Oregon's policy was associated with changes in non-Hispanic Black–White disparities in early elective cesarean delivery and early elective induction of labor.

Methods

Data and Study Population

This analysis used birth certificate records from the state of Oregon between 2008 and 2014 (n = 325,823). The Oregon Center for Health Statistics compiles vital records and provided the data files used for this study. To focus on disparities between non-Hispanic Black and White women in early elective delivery, we excluded preterm births (<37 weeks' gestation; n = 25,198), women from other racial and ethnic groups (Hispanic, Asian, American Indian/Alaska Native, or other races; n = 88,590), and out of-hospital births (n = 6,411). Although there are also important disparities in obstetric procedures and morbidities as relates to other racial and ethnic groups (Grobman et al., 2015), this analysis focused on disparities between non-Hispanic Black and White women, because these disparities are the most consistently observed. In keeping with prior literature (Kozhimannil et al., 2014), we used the Joint Commission specifications to define a population of women "at risk" for elective cesarean or labor induction by 1) excluding women with contraindications to vaginal delivery (n = 10,123), and 2) excluding women with medical conditions potentially justifying early delivery (n = 54,429; The Joint Commission, 2013). As such, all births included in the analysis were singleton births without any pregnancy-related risk factors or diagnoses that would require a cesarean delivery or delivery before 39 weeks' gestation. We also