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D. Mark Anderson
Montana State University, IZA and NBER

Kerwin Kofi Charles
Yale University and NBER

Daniel I. Rees
University of Colorado Denver, IZA and NBER

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IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

The Federal Effort to Desegregate Southern Hospitals and the Black-White Infant Mortality Gap*

In 1966, Southern hospitals were barred from participating in Medicare unless they discontinued their long-standing practice of racial segregation. Using data from five Deep South states and exploiting county-level variation in Medicare certification dates, we find that gaining access to an ostensibly integrated hospital had no effect on the Black-White infant mortality gap, although it may have discouraged small numbers of Black mothers from giving birth at home attended by a midwife. These results are consistent with descriptions of the federal hospital desegregation campaign as producing only cosmetic changes and illustrate the limits of anti-discrimination policies imposed upon reluctant actors.

JEL Classification: I14, I18, N32

Keywords: hospital desegregation, black infant mortality, Medicare, civil rights

Corresponding author:
D. Mark Anderson
Department of Agricultural Economics and Economics
Montana State University
P.O. Box 172920
Bozeman, MT 59717-2920
USA

E-mail: dwight.anderson@montana.edu

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Of all the forms of inequality, injustice in health care is the most shocking and inhumane.

--Martin Luther King Jr.

1. INTRODUCTION

In the Jim Crow Era, Southern hospitals were racially segregated. Hospitals that focused on providing care to Black patients (i.e., "Black hospitals") were, with a few exceptions, understaffed and lacked the latest medical technology (Thomas 2006; McBride 2018, pp. 49-50). White-run hospitals could be "biracial" but Black patients were physically separated from their White counterparts and did not receive equal care (Reynolds 2004; Thomas 2006). Eradicating this entrenched system of racial discrimination and exclusion was a key objective of the American Civil Rights Movement (Washington et al. 2009).

Under political and legal pressure, a handful of hospitals in the South desegregated between 1962 and 1965 (Brown-Nagin 2011, p. 207; Smith 2016). Most, however, remained racially segregated until 1966, when the Johnson administration threatened to withhold Medicare funding from hospitals not in compliance with the Civil Rights Act. The newly created Office of Equal Health Opportunity (OEHO) was tasked with determining whether hospitals were in compliance. Beginning in April of 1966, OEHO investigators, working closely with civil rights activists, visited hospitals across the country with the goal of identifying, and correcting, discriminatory practices (Nash 1968; Reynolds 1997). Six months later, more than 7,000 hospitals had been certified by the OEHO as eligible to receive Medicare funds; 214 Southern hospitals opted to remain racially segregated, forgoing all federal funding (Nash 1968; Reynolds 1997).

The federal campaign to desegregate Southern hospitals has been described as a "powerful force for equal treatment" (Smith 2016, p. 181) and "among the most important Civil Rights achievements in U.S. history" (Sternberg 2015, para. 2), yet, with one prominent exception, its effects on Black health are woefully understudied. Using data from Mississippi, Almond et al. (2006)

show that the Black postneonatal mortality rate (PNMR) fell faster in counties that were served by a Medicare-eligible hospital than in counties that were not.[1] Almond et al. (2006) conclude that hospital desegregation saved thousands of Black lives and contributed substantially to the narrowing of the national Black-White postneonatal mortality gap but these authors do not account for the strong downward trend in the Black PNMR.

In this paper, we use data from the National Vital Statistics System (NVSS) to examine the effects of the hospital desegregation campaign on Black infant mortality and the decision of where to give birth (i.e., at home or in the hospital). By focusing on five states in which support for segregationist policies and practices was especially staunch (Alabama, Georgia, Louisiana, Mississippi, and South Carolina), we are able to leverage sufficient cross-county variation in Medicare certification dates to distinguish the effects of hospital desegregation from secular trends. We find no evidence that having access to a Medicare-eligible hospital reduced Black infant mortality. Likewise, there is no evidence that the hospital desegregation campaign appreciably accelerated the trend towards in-hospital births among Southern Black mothers originally documented by Chay and Greenstone (2000).

The litmus test for Medicare eligibility was random assignment. OEHO investigators required that patients be assigned to physicians and hospital beds without regard to race, color, or national origin (Smith 2016, pp. 110-111). OEHO investigators could not, and were not asked to, address fundamental structural barriers that prevented minority patients from accessing high-quality healthcare (Smith 1998; Sarrazin et al. 2009; Chandra et al. 2017). Nor could they expunge difficult-to-observe racial attitudes and modes of communication that, to this day, shape the delivery of healthcare in the United States (Cooper et al. 2003; Alsan et al. 2019; Greenwood et al. 2020; Hill et

[1] The PNMR is the number of deaths among infants ages one through 11 months per 1,000 live births.

al. 2020). In 1972, the Government Accounting Office (GAO) released an assessment of hospital compliance with the Civil Rights Act. The report concluded that the hospital desegregation campaign had virtually eliminated "overt" racial discrimination, while more "subtle" forms of racial discrimination persisted (Comptroller General 1972, p. 10). Our results suggest that correcting overtly discriminatory practices on the part of Southern hospitals was simply not enough to ensure that Black infants experienced the same health outcomes as their White counterparts. More generally, our results are consistent with an argument from the anti-discrimination literature that punitive actions against employers are of limited effectiveness because they do not address underlying biases and prejudices (Valfort 2018).

The remainder of the paper is organized as follows. In Section 2, we provide historical context, discuss previous studies, and briefly describe some of the challenges faced by minorities today when trying to gain access to high-quality hospital care. In Section 3, we describe our methods and identification strategy, report our principal results, and document why our estimates are so different from those reported by Almond et al. (2006). In Section 4, we estimate the effect of the hospital desegregation campaign on the choice of where to give birth. Section 5 concludes.

2. BACKGROUND

2.1. Hospital desegregation

Information on the extent of segregation in Southern hospitals is available from a 1955 survey coordinated by Cornely (1956, 1957). Sixty-seven urban general hospitals in seven Southern states were assessed by local affiliates of the National Urban League. Only four of the 67 hospitals admitted Black patients without restrictions. The remaining hospitals either refused to admit Black

patients, had segregated wards, or had other "modifications of established segregated or discriminatory practices" (Cornely 1956, p. 1079).[2]

When the Civil Rights Act passed in 1964, nobody was certain how it would impact the health care system. The amendments to the Social Security Act that would eventually establish the Medicare and Medicaid programs had yet to be taken up by Congress, and most observers believed that the process of hospital desegregation would proceed slowly, dependent upon private initiative, voluntary compliance, and lawsuits brought by the victims of discrimination (Kenny 1965; Smith 2016, pp. 84-86; Largent 2018).[3]

Initially, the Johnson administration focused on encouraging hospitals to voluntarily comply with Title VI of the Civil Rights Act, which banned the allocation of federal funds to entities that discriminated on the basis of race (Largent 2018). This strategy, however, was only partially successful. In July-October of 1965, the U.S. Civil Rights Commission surveyed 39 hospitals in Southern and border states with the goal of determining whether they were in compliance. The Commission found that two hospitals, both of which were located in Maryland, had "desegregated substantially" before the passage of the Civil Rights Act; 11 of the 39 hospitals had made "significant changes in their discriminatory patterns of patient assignments, staff assignments, and

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[2] See Cornely (1956, pp. 1078-1079) and Cornely (1957, pp. 8-9) for more details on how the survey was conducted and its results. Seventy-two hospitals in 3 border states (Maryland, Missouri, and Oklahoma) were also included in the study. Ten of these 72 hospitals admitted Black patients without restrictions (Cornely 1957, p. 9). Thomas (2006) describes the availability of North Carolina hospital beds in 1960: there were 919 hospital beds in Black hospitals and 2,905 beds in White-only hospitals; in "biracial hospitals," there were 1,758 beds reserved for Black patients and 8,822 beds reserved for White patients. According to Thomas (2006, p. 854), "[b]y 1960 the vast majority of both black and white patients were being treated in biracial hospitals, whereas nearly half of white hospitals had either opened their doors to black patients or shut down since the end of World War II."

[3] Joseph Califano Jr., who served as special assistant to President Johnson, was interviewed by Smith (2016, p. 82). According to Califano,

> No one understood Johnson's plan. The Civil Rights was passed in 1964 before the enactment of all the domestic programs the following year. No one anticipated the massive flow of federal funding that would begin in 1965. If the civil rights bill had been pushed after all of that subsequent legislation, it would have never passed.

access to public facilities" since its passage, while the other 26 still engaged in discriminatory practices (U.S. Civil Rights Commission 1966, p. 6). For instance,

> At the time of the Commission investigation, James Walker Memorial Hospital in Wilmington, North Carolina, which had been involved in a decade of litigation over its segregated facilities, continued to maintain a building for Negro patients at the rear of the main facility. Negro patients were wheeled from the separate structure into the main facility for surgery and other services. Some Negro patients were housed in segregated wards in the main building. The hospital also made staff assignments according to race although the administrator said some Negro nurses had been assigned to care for white patients since the passage of the Civil Rights Act (U.S. Civil Rights Commission 1966, p. 8).[4]

The Commission concluded that the pace of hospital desegregation was largely determined by local factors (e.g., the hospital "administrator or board") as opposed to efforts on the part of the Public Health Service (PHS), which was, in theory, responsible for ensuring Title VI compliance (U.S. Civil Rights Commission 1966, p. 14).[5]

Under increasing pressure from civil rights groups, a profound shift in the federal government's strategy occurred in the beginning of 1966: hospitals that wanted to participate in the soon-to-be launched Medicare program would have to be certified as Title VI compliant and the OEHO (which was created in February of 1966 and was under the auspices of the PHS) would be in charge of the certification process. The OEHO quickly promulgated a detailed set of guidelines for participating hospitals. The litmus test of Title VI compliance was random assignment: the new

[4] To take another example of discriminatory practices documented by the Commission, the

> Macon Hospital in Georgia had made only minimal changes to comply with Title VI provisions. After passage of the Civil Rights Act, the hospital converted its formerly all-Negro building into a facility for welfare patients only. Negros account for 60 to 70 percent of the welfare patient load. No Negro and white patient occupied the same room or ward in this building at the time of the Commission staff visit (U. S. Civil Rights Commission 1966, pp. 8-9).

[5] As late as April of 1966, the OEHO estimated that only 25 percent of hospitals in the South (and only 11 percent of hospital beds) were in compliance with Title VI (Reynolds 1997).

OEHO guidelines stipulated that patients were to be assigned to hospital rooms, wards, and buildings "without regard to race, color, or national origin"; likewise, medical staff were to be matched with patients "without regard to race, color, or national origin" (Smith 2016, pp. 110-111).[6]

The OEHO trained hundreds of investigators to conduct on-site inspections (Griffin 1966; Smith 2016). Working closely with local civil rights activists and Black hospital workers, they identified, and tried to correct, discriminatory practices. Although there are accounts of medical staff and administrators adopting the Title VI guidelines with little fanfare (Nash 1968; Brown-Nagin 2011; Smith 2005, 2016, pp. 120-128), the demands of the OEHO investigators were occasionally met with fierce resistance (Smith 2005, 2016, pp. 120-128). In fact, 214 Southern hospitals decided that they would forgo federal funding rather than integrate their facilities (Nash 1968; Reynolds 1997).

By November of 1966, the OEHO had certified more than 7,000 hospitals as Medicare-eligible (Nash 1968; Reynolds 1997).[7] A few months later, the OEHO was dismantled and enforcement of the Title VI guidelines fell to the Office of Civil Rights (OCR). Under the OCR, enforcement was not nearly as strict as it had been under the OEHO (U.S. House of Representatives 1973; Quadagno 2000). The OCR relied heavily on complaints of discrimination made by Medicare and Medicaid beneficiaries to identify non-compliant hospitals; on-site reviews were rare and there is anecdotal evidence of ostensibly desegregated hospitals blatantly flouting Title VI guidelines (U.S. House of Representatives 1973; Quadagno 2000).[8]

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[6] Hospitals were also required to notify employees and persons previously excluded from services that they were in compliance with the Civil Rights Act (Reynolds 2004).

[7] For more information on the history of hospital desegregation and the efforts of the OEHO, see Nash (1968), Reynolds (1997, 2004) and Smith (2016).

[8] There were only 300 on-site hospital reviews conducted by the OCR in 1971 (Comptroller General 1972). In hearings before the Civil Rights and Constitutional Rights Subcommittee (U.S. House of Representatives 1973), Jeffrey Merrill, a representative of the American Public Health Association (APHA), testified that:

In July of 1972, the GAO released an assessment of hospital Title VI compliance. Focusing on four metropolitan areas (Atlanta, Birmingham, Detroit, and Los Angeles), it described the federal hospital desegregation campaign as having all but eliminated "overt" discrimination (Comptroller General 1972). GAO investigators did, however, observe that a "disproportionately large share of minority patients received their healthcare at government-owned hospitals" and that private hospitals routinely denied staff privileges to Black physicians (Comptroller General 1972, p. 10). The practice of denying privileges to Black physicians effectively barred their patients, who were themselves predominantly Black, from being admitted to private hospitals.[9] According to GAO investigators, public hospitals "attracted" minorities because they provided low-cost care to indigent patients, were easily accessible, and had a history of treating minority patients.[10]

2.2. Hospital desegregation and the Black-White infant mortality gap

Over the past century, the Black infant mortality rate (IMR) in the United States has fallen at an average annual rate of 2.6 percent (Singh and Yu 2019). However, because the White IMR has

> Last year the APHA was involved in a study in Mississippi where we had the opportunity to examine a lot of hospitals within the delta area. There were two things we found out through this study. One is…that, on a given day when the hospital is forewarned of a visit by some sort of enforcement agency, beds are shifted and it is very simple to shift a bed on wheels. And so coincidentally, on that and maybe for a couple of days, the hospital appears totally integrated.

[9] Only 93 Black physicians were practicing medicine in Atlanta and Birmingham. Black patients in these cities relied heavily on outpatient clinics run by public hospitals, and the Black physicians who worked at these clinics and public hospitals did not want (or did not use) staff privileges at private hospitals because "of (1) loyalty to predominantly black-patient hospitals…, (2) the desire to have their patients near their offices, or (3) the time and expense of making rounds at several hospitals" (Comptroller General 1972, pp. 32-33).

[10] There were 24 Medicare-certified hospitals in Atlanta and Birmingham when the GAO conducted its investigation, all but two of which were private. In Atlanta, the county-run Grady Memorial Hospital served fully 58 percent of all Black patients during the period July 19-26, 1971. In Birmingham, University Hospital served 49 percent of Black patients. Five of the 22 private hospitals in Atlanta and Birmingham admitted a combined total of 12 Black patients and 442 White patients. According to the report, most Black patients in Atlanta and Birmingham knew that Medicare and Medicaid would cover their costs at private hospitals (Comptroller General 1972). Quadagno (2000) describes Black patients as fearing that they would be refused care at hospitals with a long tradition of exclusively serving White patients despite the fact that these hospitals were certified and ostensibly desegregated. Bledsoe (1968) provides additional accounts of Black patients being reluctant to use formerly White-only hospitals.

fallen at a faster rate (3.1 percent), the Black-White IMR ratio actually increased (Singh and Yu 2019).[11] Intriguingly, the Black-White IMR ratio fell by 13 percent during the period 1965-1971, from 1.9 to 1.65 (Chay and Greenstone 2000). Although there had been smaller, one- and two-year reductions in the Black-White IMR ratio since the end of World War II, this was the first sustained decline for 20 years.

Almond et al. (2006) attribute much of this decline to the hospital desegregation campaign in the South. They reach this conclusion by estimating the effects of the hospital desegregation campaign on postneonatal mortality rates (PNMRs) by race in Mississippi. Almond et al. (2006) show that the Black PNMR fell much faster in counties served by at least one Medicare-eligible hospital as compared to counties served by hospitals that refused federal funding. The estimated effect on the Black PNMR is large enough to explain the entire convergence between Black and White IMRs in Mississippi over the period 1965-1971.[12]

Opposition to the hospital desegregation campaign was particularly fierce in Mississippi (Reynolds 1997; Smith 2005). Despite this opposition, most Black mothers in Mississippi had the option of delivering their baby at a Medicare-eligible hospital by the end of 1967.[13] By the end of 1969, all but five counties in the state were served by at least one Medicare-eligible hospital (or their residents had the option of receiving care at a certified hospital in a bordering county). This "modest variation" in Medicare certification dates precluded Almond et al. (2006, p. 15) from

[11] In 1916, the Black IMR was 184.9 per 1,000 live births and the White IMR was 99.0; by 2017, the Black IMR had fallen to 10.8 per 1,000 live births and the White IMR had fallen to 4.9 (Singh and Yu 2019).

[12] Almond et al. (2006, p. 18) conclude that the "integration of hospitals in the rural South accounted for…25% (based on all post-neonatal fatalities) of the national 7.5 per 1,000 decline in the national black PNMR between 1965 and 1975." See also Finkelstein and McKnight (2008). Using data from the Mississippi Delta, these authors examine the effect of having access to a Medicare-eligible hospital on mortality among the elderly. They find that access to a Medicare-eligible hospital was associated with a 35 percent reduction in non-White elderly pneumonia mortality.

[13] See Appendix Table A1. In 1967, 45 out of 82 Mississippi counties were served by a Medicare-certified hospital, while 12 counties had no hospital (certified or otherwise) but their residents had the option of receiving care at a certified hospital in a bordering county. During the period 1955-1975, 64 percent of Black births occurred in these 57 counties.

including year fixed effects in their regressions.[14] One of the advantages of using data from five Deep South states, as opposed to only Mississippi, is that we observe more than twice as many counties whose residents gained access to a Medicare-eligible hospital after 1967, which allows us to distinguish the effects of access from the secular Black IMR trend.

Aside from the pioneering work of Almond et al. (2006), we do not know a great deal about the relationship between hospital desegregation and health.[15] Researchers have, however, attempted to gauge the effects of school desegregation on various educational outcomes. These effects are, *a priori*, difficult to sign (Reber 2007; Reardon and Owens 2014), although several studies provide evidence that Black students benefit from attending integrated schools (Guryan 2004; Reber 2010, 2011; Johnson 2011).[16] There is also large literature on anti-discrimination policies and labor market outcomes. In a review of this literature, Valfort (2018) concludes that the "punitive approach" (i.e., imposing sanctions on employers who discriminate) is not particularly effective because it does not counter prejudice or limit the expression of cognitive biases.

[14] Almond et al. (2006, p. 15) note that their estimates become statistically insignificant when year fixed effects are included on the right-hand side of their regression "due to the difficulty of separately identifying the year and event time fixed effects with the modest variation in Medicare certification dates."

[15] Building on the work of Almond et al. (2006), Chay et al. (2009, 2014) argue that hospital desegregation led to a narrowing of the Black-White PNMR gap in the South, ultimately leading to improvements in test scores, educational attainment, and earnings among Blacks. See also Thompson (2020), who provides evidence that selective fertility during the period 1965-1971 drove these improvements.

[16] For instance, Guryan (2004) finds that desegregation led to an almost three percentage-point decline in the dropout rate of Black students but had no appreciable effect on White dropout rates. Reber (2010, 2011) finds that, after desegregation, predominantly Black school districts in Louisiana received more funding and were able to reduce class sizes, while funding and class sizes in predominantly White school districts did not change. Johnson (2011) finds that an additional year of court-ordered desegregation led to a one percentage-point increase in Black high school graduation rates but had no effect on White high school graduation rates. For more information on the relationship between school desegregation and student outcomes, see Ashenfelter et al. (2006), Billings et al. (2014), Bergman (2016), and Gamoran and An (2016). Relatedly, Thompson (forthcoming) finds that school desegregation led to a 42 percent reduction in Black teacher employment.

2.3. Other determinants of the Black-White infant mortality gap

The Black-White infant mortality gap has existed in the United States since at least the turn of the 20th century, when reliable mortality data by race first became available (Ewbank 1987). Its causes are still being researched, and debated, today (Elder et al. 2016; Wallace et al. 2017; Smith et al. 2018; Anderson et al. 2019; Taylor et al. 2019).

Relatively crude measures of socioeconomic status (e.g., mother's age, education, and marital status) can explain approximately one-third of the Black-White infant mortality gap (Elder et al. 2014; Elder et al. 2016). The other two-thirds of the gap are attributable to myriad factors, including, but not limited to, local geography, hospital quality, physician behavior and characteristics, and government policies.[17] Isolating the effects of racial discrimination has proven to be especially challenging (Wallace et al. 2017).

Greenwood et al. (2020) examine newborns delivered in Florida hospitals during the period 1992-2015. Matching the race of the attending physician to that of the newborns, these authors find that Black newborns cared for by a Black physician are more likely to survive than those cared for by a White physician. The reverse, however, is not true: physician race is essentially unrelated to White newborn mortality. Because differences in hospital and physician quality do not explain these results (the authors control for hospital and physician fixed effects), Black physicians appear to be systematically outperforming their White colleagues for other, difficult-to-measure reasons.

Racial prejudice could explain why Black physicians are better at treating Black newborns than their White counterparts. It is also possible that the estimates in Greenwood et al. (2020) are driven by mistrust between Black patients and their White physicians. Cooper et al. (2003) provide

[17] Elder et al. (2014, 2016) include state indicators on the right-hand side of their regressions, but local geography can be an important obstacle to accessing high-quality healthcare. As noted by Chandra and Skinner (2004) and Chandra et al. (2017), providing health insurance and strictly enforcing Title VI does not make it any easier for minorities to access hospitals that are located far from where they live and work.

evidence that healthcare visits are shorter when Black patients are assigned to a White, as opposed to a Black, physician. Alsan et al. (2019) find that Black men are more likely to demand preventative care when randomly assigned to a Black physician.[18]

3. CERTIFIED HOSPITAL ACCESS AND INFANT MORTALITY

Figure 1 shows IMRs by race and year in the Deep South for the period 1959-1973.[19] The Black and White IMRs are both trending downward, but the Black IMR trend is clearly steeper, especially after 1966.

Did the hospital desegregation campaign, which was launched in 1966, contribute to the narrowing of the Black-White infant mortality gap shown in Figure 1? Black Southerners made significant economic progress throughout the 1960s (Freeman 1981; Donohue and Heckman 1991; Wright 1999), and there was a sharp reduction in Black fertility immediately after the Civil Rights Act was passed (Thompson 2020). Other government interventions, including the rollout of Community Health Centers (CHCs) and the implementation of state Medicaid programs, could have also contributed to the observed trends (Goldman and Grossman 1988; Bailey and Goodman-Bacon 2015; Goodman-Bacon 2018).[20]

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[18] See also Hill et al. (2020) and Alsan and Wanamaker (2018). Hill et al. (2020) find that being attended by a same-race physician in the emergency department is associated with a 13 percent reduction in mortality. Alsan and Wanamaker (2018, p. 412) find that proximity to the Tuskegee study had long-lasting effects on whether Blacks "trust a doctor's judgement and whether they suspect that the medical establishment will deny them necessary treatment or services."

[19] In 1972, due to personnel and budgetary restrictions, the mortality counts from the Multiple-Cause-of-Death Files were based on information obtained from a 50-percent sample of death records, as opposed to the complete census of death records as in other years (U.S. Department of Health, Education, and Welfare 1976). In practice, this means aggregating the mortality counts to the county level and multiplying by two.

[20] The rollout of CHCs across the South began in 1965. Bailey and Goodman-Bacon (2015, p. 1075) note that "CHCs could have facilitated the diagnosis of potentially lethal diseases and afford medications for treatment, but they were not substitutes for hospitals' acute care for sick infants." In 1966, Louisiana became the first state in the Deep South to implement Medicaid. It was followed shortly thereafter by Georgia (1967), South Carolina (1968), Mississippi (1969), and Alabama (1970). Goodman-Bacon (2018) provides evidence that the introduction of state Medicaid programs reduced non-White infant mortality. Below, we report separate pre- and post-Medicaid estimates of the effect of having

To distinguish the effect of the hospital desegregation campaign from the effects of Black economic progress and other government interventions, we begin by estimating the following baseline regression by race:

$$(1) \qquad IMR_{ct} = \beta_0 + \beta_1 Medicare_{ct} + v_c + \varepsilon_{ct},$$

where c indexes counties and t indexes years.[21] Our independent variable of interest, $Medicare_{ct}$, is equal to one if Black mothers in county c during year t had access to a general or maternity hospital that was certified as Medicare-eligible (and is equal to zero otherwise). It is based on when the first hospital in county c was listed as Medicare-eligible in "Guide Issues," published by the *Journal of the American Hospital Association* (*JAHA*).[22] If there were no hospitals in county c, then access was determined based on whether there was a certified hospital operating in a bordering county. County fixed effects, v_c, account for determinants of infant mortality that were constant over time.

Estimates of β_1 by race are presented in columns (1) and (5) of Table 1. Regressions are weighted by live births and standard errors are corrected for clustering at the county level (Bertrand et al. 2004). Consistent with the results of Almond et al. (2006), we find that having access to a

access to a desegregated (i.e., Title VI-compliant) hospital. Hospitals that were certified as Title VI-compliant could participate in both programs.

[21] While we report estimates based on the IMR throughout, results are similar if we take the natural log of one plus the IMR or the quartic root of the IMR. The quartic root function has been used by other researchers to account for zeros (Thomas et al. 2006; Tarozzi et al. 2014; Ashraf et al. 2015).

[22] The Medicare program was officially launched on July 1, 1966. The 1967 *JAHA* Guide Issue lists Medicare-eligible hospitals through February of 1967. If any hospital in county c was certified as Medicare-eligible in 1966 or in January/February of 1967, then the access indicator is equal to 1 in t = 1967, 1968, …, 1973. The 1968 *JAHA* Guide Issue lists Medicare-eligible hospitals through February of 1968. If the 1967 Guide Issue did not list any hospital in county c as certified but the 1968 Guide Issue did, then the access indicator is equal to 1 in t = 1968, 1969, …, 1973, and so forth. See the notes to Appendix Table B1 for more details. In an effort to confirm the accuracy of the certification dates in the Guide Issues, we spot checked them against information available in contemporary local newspaper articles. Almost without exception, the certification dates listed in the Guide Issues were consistent with contemporary accounts.

Medicare-eligible hospital is associated with substantially fewer Black infant deaths. Specifically, certified hospital access is associated with a 13.3 reduction in the Black IMR, which is 28 percent of the pre-treatment mean. Having access to a certified hospital is associated with a 4.9 reduction in the White IMR, or 21 percent of the pre-treatment mean.

Because year fixed effects are not included on the right-hand side of (1), we cannot distinguish between the effects of having access to a Medicare-eligible hospital and common shocks to IMRs across the Deep South.[23] Exploiting cross-county variation in Medicare-certification dates, we estimate:

$$(2) \qquad IMR_{ct} = \beta_0 + \beta_1 Medicare_{ct} + v_c + \lambda_t + \varepsilon_{ct},$$

where the year fixed effects are represented by λ_t.

The results, which are reported in columns (2) and (6) of Table 1, provide little evidence that the hospital desegregation campaign was effective. In fact, the estimate of β_1 for Black infants becomes positive and statistically insignificant at conventional levels. The estimate of β_1 for White infants is still negative but is only half as large as the estimate shown in column (5).

Including a vector of county-level controls, $\boldsymbol{X}_{ct}$, and county-specific linear trends on the right-hand side of the estimating equation does not appreciably affect the basic pattern of results.[24]

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[23] Appendix Table A1 shows the number of counties in the Deep South in which Black mothers had access to a Medicare-eligible hospital by state and year. In 1967, Black mothers had access in 335 out of the 403 Deep South counties in our sample; by 1968, they had access in 378 of these counties; and by 1969 they had access in 385. Black mothers in the remaining 18 out of 403 counties gained access to Medicare-certified hospitals between 1970 and 1973. Fifteen Deep South counties are missing from our sample. Nine Alabama counties are excluded due to missing data on live Black births. Six Georgia counties are excluded because no live Black births were recorded during the sample period.

[24] The controls are listed in Appendix Table A2, along with descriptive statistics, definitions, and sources. They include the percent of the county population that was 25 years of age or older with a high school diploma, direct health and hospital expenditures by the county government, and the county employment to population ratio. Missing values were calculated via linear interpolation and extrapolation. Appendix Table B2 lists the sources used to collect data on county-level live births.

Access to a certified hospital is associated with a 1.4 increase in the Black IMR and a 2.0 decrease in the White IMR. Although statistically insignificant at conventional levels, these estimates are reasonably precise. Based on the lower bound of the 90 percent confidence interval of the estimate of β_1 shown in column (4), certified hospital access did not reduce the Black IMR by more than 1.00, or only 7 percent of the actual change in the Black IMR between 1965 and 1973.[25]

3.1. Event-study estimates

Regression models such as (2) can produce biased estimates if the effect of treatment grows stronger (or weaker) over time (Goodman-Bacon 2020). To address this issue, we report event-study estimates of the relationship between having access to a Medicare-certified hospital and IMRs in Table 2 (Sun and Abraham forthcoming). Replacing the access indicator with a series of its leads and lags also allows us to explore whether the parallel trends assumption holds. Because we have no strong priors about the correct lag structure, we flexibly estimate the effect of having access one, two, three, and four or more years after treatment (i.e., the year in which certification occurred).

The first column of Table 2 shows event-study estimates for Black infants produced without including year fixed effects. In year 0 (i.e., the year of treatment), having access to a Medicare-certified hospital is associated with a 3.21 reduction in the Black IMR. After year 0, the estimated effect of having access to a Medicare-eligible hospital steadily becomes stronger. Four or more years after treatment, access is associated with 13.3 fewer Black infant deaths per 1,000 births, which is very close to the largest event-study estimates reported by Almond et al. (2006). The pre-treatment trends, however, cast doubt on whether these estimates should be given a causal interpretation: the

[25] During the period 1965-1973, the Black IMR fell from 45.7 to 31.3, and the White IMR fell from 23.1 to 18.9 (Figure 1). Based on the upper bound of the 90 percent confidence interval of the estimate of β_1, certified hospital access did not increase the White IMR by more than 0.097.

positive and significant coefficient estimates for the indicators *3 Years Before Medicare* and *4+ Years Before Medicare* suggest that the post-treatment estimates are simply a continuation of the pre-treatment trend.

In column (2) of Table 2, we report event-study estimates controlling for year fixed effects. With their inclusion, the pre-treatment trend for the Black IMR disappears but the estimated post-treatment coefficients are small, statistically insignificant, and (with one exception) positive. In columns (3) and (4), we first include $\boldsymbol{X}_{ct}$ and then county-specific linear trends on the right-hand side of the estimating equation. Three years after treatment, having access to a Medicare-eligible hospital is associated with a (statistically insignificant) 3.21 reduction in the Black IMR; 4 years after being treated, access is associated with a (statistically insignificant) 5.79 reduction in the Black IMR. These estimates, although negative, appear to be a continuation of a pre-treatment trend with no evidence of acceleration after year 0. Figure 2 plots the coefficient estimates (and their 90 percent confidence intervals) reported in columns (3) and (4) of Table 2.

In the remaining columns of Table 2, we report event-study estimates for the White IMR. The fully specified regression model produces a similar pattern of results as was found for the Black IMR. Three years after treatment, access is associated with a (statistically insignificant) 4.64 reduction in the White IMR; 4+ years after being treated, access is associated with a (statistically insignificant) 3.91 reduction in the White IMR.[26] We view these estimates as evidence that both event-studies are simply capturing common determinants of infant health as opposed to the effects of the federal desegregation campaign.

[26] Figure 3 plots the coefficient estimates shown in columns (7) and (8) for the White IMR.

3.2. Mortality by cause

From 1959 to 1973, the Black IMR fell from 50.8 to 31.3 (Figure 1). Nearly half of this reduction can be attributed to fewer deaths during the postneonatal period (Figure 4). Almond et al. (2006) argue that, given the medical technology available in the 1960s, gaining access to a Medicare-certified hospital should have had a more pronounced effect on postneonatal, as opposed to neonatal, mortality.[27]

In columns (1) through (4) of Table 3, we explore this possibility by distinguishing between the Black neonatal mortality rate (NMR) and the Black PNMR. Regardless of whether we control for county-specific linear trends, there is little evidence that gaining access to a Medicare-eligible hospital reduced either the Black NMR or PNMR. The estimated coefficients are small, statistically insignificant, and positive.

Pneumonia/influenza and diarrhea were two of the leading causes of mortality among U.S. infants during the sample period (U.S. Department of Health, Education, and Welfare 1963). Figures 5 and 6 show pneumonia/influenza and diarrhea mortality rates, respectively, for infants in the Deep South by race and year.[28] From 1959 through 1965, there is little evidence that deaths from these causes were on a downward trend. However, Black infant mortality from diarrhea began to fall after 1965, followed by Black infant mortality from pneumonia/influenza the next year. In the remaining columns of Table 3, we formally test whether the campaign to desegregate hospitals

[27] Technologies benefitting premature and low-weight infants were not developed and diffused widely until the 1970s and 1980s (e.g., improvements in mechanical ventilation and the adoption of local neonatal intensive care units) (Almond et al. 2006).

[28] Infants suffering from severe diarrhea can be rehydrated intravenously or orally in the hospital and administered antibiotics (Koletzko and Osterrieder 2009). Influenza can lead to secondary bacterial infections (including pneumonia) that are treatable with antibiotics (Munoz 2002). Pneumonia and gastroenteritis "were readily and necessarily" treated in hospitals during the 1960s (Almond et al. 2006, p. 12). Appendix Table B3 lists the International Classification of Disease (ICD) codes that were used to generate infant mortality counts by cause. During the period under study, the ICD underwent its 8th revision, taking effect in 1968. Because these changes applied to all counties in our sample, they are captured by the year fixed effects.

contributed to these trends. Again, the estimates of β_1 are small, statistically insignificant, and positive. For instance, according to the fully specified model, having access to a certified hospital is associated with a 0.24 increase in the diarrhea mortality rate among Black infants.

3.3. Extensions and robustness checks

Up to this point in the analysis, we have defined treatment based on when the first hospital in county *c* was certified as Medicare-eligible. Using information available in the *JAHA* Guide Issues, we explore alternative measures of treatment in the first three columns of Table 4. Specifically, we define treatment based on the following thresholds: whether 25 percent (or more) of the hospital beds in county *c* belonged to Medicare-eligible hospitals, whether 50 percent of the hospital beds belonged to Medicare-eligible hospitals, and whether 75 percent of the hospital beds belonged to Medicare-eligible hospitals. Results based on these alternative specifications provide no evidence that the Black IMR was related to hospital desegregation.[29]

Next, we distinguish between counties in which the first hospital was certified as Medicare-eligible in 1966-1967 and those in which the first hospital was certified in 1968 or later. Presumably, non-compliance after 1967 is indicative of greater racial animus.[30] The results, which are reported in

[29] Appendix Table A3 lists the proportion of treated counties by state and year based on these alternative thresholds.

[30] Smith (2005) describes the process of desegregating the two private hospitals in Jackson, Mississippi. St. Dominic Hospital was part of a hospital system based in Springfield, Illinois. It quickly complied with Title VI guidelines and began receiving Medicare payments in July of 1966. By contrast, Baptist Hospital's board of trustees was composed of "white Mississippians" (Smith 2005, p. 262). Baptist Hospital remained segregated through April of 1969, when, under intense financial pressure, the board voted "to take steps to develop a plan for qualifying the hospital for Medicare and Medicaid patients" ("Hospital to Seek CR Okay" 1969). In response to this vote, the state field director of the National Association for the Advancement of Colored People (NAACP), Charles Evers, sent a telegram to Robert Finch, the Secretary of the U.S. Department of Health, Education, and Welfare, describing Baptist as "the most segregated hospital in Mississippi" (Associated Press 1969). Descriptions of hospitals certifying after 1967 in Alabama, Georgia, Louisiana, and South Carolina are available from contemporary newspaper articles. For instance, see: "Monroe Hospital Approved for Medicare" (1968), Constitution State News Service (1968), "Federal Examiner Orders HEW To Certify P&S Hospital Here" (1969), and "Tuomey Now on Medicare" (1969).

column (4) of Table 4, suggest that, regardless of when certification occurred, Title VI compliance had no effect on the Black IMR.

Seventy-five out of the 403 counties in our analysis were not served by a general or maternity hospital prior to 1967. Up to this point in the analysis, treatment for these counties has been based on whether there was a Medicare-eligible hospital operating in a bordering county. In column (5) of Table 4, we report an estimate of β_1 dropping these no-hospital counties from the sample. Again, the estimate is small, positive, and statistically insignificant. In column (6), we control for the number of bordering counties with at least one Medicare-eligible hospital. Including this variable on the right-hand side of our regression model has little effect on the estimate of β_1. Similarly, if we detrend the dependent variable as suggested by Goodman-Bacon (2020)[31], include state-by-year fixed effects, or do not weight the regression by live births, the estimate of β_1 is small, positive, and insignificant.

The Louisiana Medicaid program began issuing payments to hospitals as of July 1, 1966, which means that we cannot distinguish between the effects of having access to a Medicaid- vs. Medicare-eligible hospital in Louisiana. Participation in both of these programs required Title VI compliance. In the other Deep South states, Medicaid implementation came after 1966, allowing us to estimate the following regression:

$$(3) \qquad IMR_{cst} = \beta_0 + \beta_1 Medicare_{ct} + \beta_2 (Medicare_{ct} \times Medicaid_{st}) + \mathbf{X}_{ct}\boldsymbol{\beta}_3 + v_c + \lambda_t + \Theta_c \cdot t + \varepsilon_{cst},$$

[31] Goodman-Bacon (2020) suggests estimating separate pre-treatment trends based on the timing of treatment (e.g., estimating a pre-treatment trend for counties that became Medicare eligible in 1967, another pre-treatment trend for counties that became Medicare eligible in 1968, and so forth). These pre-treatment trends are then projected onto the post-treatment period and used to detrend the dependent variable. For details of this procedure, see Appendix D in Goodman-Bacon (2020).

where the effect of having access to a Title VI-compliant hospital is given by β_1 and the effect of having access to a Title VI-compliant hospital with the option of Medicaid covering the expenses is given by $\beta_1 + \beta_2$.[32] The results of this exercise are reported in column (9) of Table 4. The estimate of β_1 is essentially unchanged. The estimate of β_2 is negative, small in magnitude, and statistically indistinguishable from zero, suggesting that the Medicaid program had little, if any, effect on Black infant mortality.[33]

3.4. State-by-state estimates

In Table 5, we show separate estimates of the effect of having access to a Medicare-certified hospital on the Black IMR for each of the five Deep South states.[34] Three out of the five estimates are positive, including the estimate for Mississippi. The estimated effect of having access in Alabama is positive and actually statistically significant at the 10 percent level. None of the other estimates of β_1 are statistically distinguishable from zero.[35]

The estimates reported in Table 5 are based on the fully specified regression model, which includes county-level covariates and county-specific linear trends. In Appendix Table A4, we build up to the fully specified regression model by sequentially adding controls. Estimates based on

[32] The Georgia Medicaid program was implemented in October of 1967; the South Carolina program was implemented in July of 1968; the Mississippi program was implemented in October of 1969; and the Alabama program was implemented in January of 1970. Estimating a regression model that also controls for the direct effect of Medicaid produces qualitatively similar results.

[33] Exploiting cross-state variation in categorical eligibility, Goodman-Bacon (2018) documents a sharp reduction in non-White infant mortality after the implementation of state Medicaid programs. Dropping Southern states did not appreciably affect his estimates.

[34] Figure 7 shows the Black IMR by state and year. There is a clear downward trend across the Deep South during the period under study. Through 1964, Black IMRs were higher in Mississippi and South Carolina than in Alabama, Georgia, and Louisiana. From 1964 through 1968, the Black IMR was notably higher in Mississippi than in the other four states.

[35] Appendix Figures A1 through A5 show event-study estimates of the effect of having access to a Medicare-eligible hospital on the Black IMR for each of the five Deep South states.

equation (1), which does not include year fixed effects, are reported in the first column and are uniformly negative, large in magnitude, and statistically significant at the one percent level. Tellingly, the largest negative estimate is for South Carolina, the state that experienced the largest decline in its Black IMR from 1959 to 1973 (Figure 7).

Estimates based on equation (2) are shown in column (2) of Appendix Table A4. These estimates make it clear that, across all five states, the estimates of β_1 reported in column (1) are simply capturing the secular trend in the Black IMR. With the inclusion of year fixed effects, they lose statistical significance and four out of five become positive. Controlling for the county-level covariates and county-specific linear trends has little impact on these estimates.

In the first two columns of Appendix Table A5, we report the event-study estimates produced by Almond et al. (2006, Table 4, columns 1a and 1b) for postneonatal mortality, which are based on data from Mississippi alone. Their fully specified model includes county-level controls, county fixed effects, and county-specific linear trends. As noted above, their estimates are negative, significant, and large enough to explain the narrowing of the Black-White IMR gap in Mississippi from 1965 to 1971. For instance, having access to a Medicare-eligible hospital for four years is associated with a 10.3 reduction in the Black PNMR.

Although we do not have the information necessary to perfectly reconstruct Almond et al.'s (2006) county-level controls, we are able to come reasonably close to reproducing their estimates in columns (3) and (4) of Appendix Table A5.[36] In column (5), we omit the county-specific linear trends and instead add year fixed effects to their regression model. The estimated effects of having access to a Medicare-eligible hospital become much smaller and lose statistical significance. In column (6), we include both the county-specific linear trends and year fixed effects on the right-

[36] Specifically, Almond et al. (2006) control for the fraction of mothers across five age categories, the fraction of unmarried mothers, per-capita income, and per-capita transfer payments.

hand side of Almond et al.'s (2006) regression model. The standard errors become sufficiently large that we cannot reject the hypothesis that the estimates reported in column (6) are equal to those reported in either column (4) or (5). Similarly, we cannot reject the hypothesis that the estimated effects on the Black PNMR are equal to the estimated effects on the White PNMR, which are also consistently negative and of roughly comparable magnitude in the fully specified model (panel II of Appendix Table A5).[37]

4. IN-HOSPITAL BIRTHS AND MATERNAL MORTALITY

During the period 1955-1965, out-of-hospital births to Southern Black mothers were declining steadily (Chay and Greenstone 2000). By 1965, less than 10 percent of Black infants in urban Southern counties were delivered at home, attended by either a doctor or midwife; less than 30 percent of Black infants in rural Southern counties were delivered at home (Chay and Greenstone 2000).

Giving birth in the hospital did not, however, guarantee receipt of high-quality care for Black mothers and their babies. "Biracial hospitals" discriminated against Black patients, assigning them to separate wards or buildings, while Black hospitals were, with only a few exceptions, understaffed and under-resourced (Reynolds 2004; Thomas 2006; McBride 2018, pp. 49-50).[38] After the

[37] In Appendix Table A6, we report the event-study estimates produced by Almond et al. (2006, Table 4, columns 2a and 2b) for postneonatal mortality due to pneumonia, influenza, and diarrhea. The results are similar to those reported in Appendix Table A5. In the top panel of Appendix Figure A6, we reproduce the event-study estimates in Almond et al. (2006, Figure 3), which are from a specification that does not include year fixed effects, county fixed effects, or county-level covariates. In the bottom panel of Appendix Figure A6, we illustrate what happens to these estimates when county and year fixed effects are included in the regression model. Finally, we adopt Almond et al.'s (2006) specification in Appendix Table A7 and estimate the effect of the hospital desegregation campaign on Black postneonatal mortality in all five Deep South states. When we include year fixed effects and county-specific linear trends, the estimated effects of having access to a Medicare-eligible hospital on Black postneonatal mortality due to pneumonia, influenza, and diarrhea become positive and significant (panel II, column 4), allowing us to formally reject the hypothesis that they are equal to those produced without controlling for year fixed effects (panel II, columns 1 and 2).

[38] The practice of assigning Black patients to their own wards, floors, or buildings also had the effect of limiting access. To avoid overcrowding, Black patients could be refused admission despite the availability of "white beds" (U.S. Civil

introduction of Medicare and Medicaid, Black hospitals struggled financially and most eventually closed (Beardsley 1996; Odum 1992; Smith 2016, pp. 168-169). Black mothers living in the South were left with the choice of delivering in a formerly discriminatory (i.e., White-only or segregated) hospital or at home, attended by a midwife or physician, neither of whom was necessarily well trained in obstetrics (Mongeau et al. 1961; Houde et al. 1982; Ward 2003).

Figure 8 shows the in-hospital birth rate (i.e., the number of in-hospital births per 1,000 live births) by race in the Deep South for the years 1959-1973. In-hospital Black births were rising steadily throughout this period. In 1959, the first year of our analysis, 57 percent of Black births took place in the hospital. By 1973, 94 percent of Black births were in-hospital.

Did federal efforts to desegregate hospitals contribute to the trends shown in Figure 8? To answer this question, we use data from state vital statistics reports and the NVSS[39] and estimate:

$$(4) \qquad \textit{In-Hospital Births}_{ct} = \beta_0 + \beta_1 \textit{Medicare}_{ct} + \boldsymbol{X}_{ct}\boldsymbol{\beta}_2 + v_c + \lambda_t + \Theta_c \cdot t + \varepsilon_{ct},$$

which includes the vector of county-level controls described above, county fixed effects, year fixed effects, and county-specific linear trends. The dependent variable, $\textit{In-Hospital Births}_{ct}$, is equal to the number of in-hospital Black births per 1,000 live Black births.[40]

Rights Commission 1966, pp. 12-13). Black hospitals were often White-run but focused on providing care to Black patients (Rice and Jones 1994).

[39] Because the Natality Files, published by the NVSS, did not make information available on birth attendant type for the years 1960-1967, we transcribed records from individual state vital statistics reports. Appendix Table B2 lists the sources used to collect information on county-level live births by location (i.e., in- versus out-of-hospital) and attendant (i.e., physician versus midwife). Another advantage to using state vital statistics records is that the NVSS is missing data on live births by race for roughly 10 percent of the counties in our sample. Information on live births by attendant is unavailable at the county level from Alabama vital statistics records. As a result, Alabama is excluded from all birth location/attendant analyses in this section.

[40] Prior to 1975, information on whether a hospital birth was attended by a physician or a midwife was not included on the birth certificate. Presumably, however, the vast majority of these births were attended by a physician. In 1975, 97 percent of in-hospital births in the United States were attended by a physician. Of the remainder, 0.6 percent were

The results of this exercise are reported in the first column of Table 6. Access to a Medicare-eligible hospital is associated with an additional 32 Black in-hospital births per 1,000 live births. While this estimate is precise, it explains less than nine percent of the movement towards in-hospital births among Black mothers during the period under study.[41]

Next, we examine the effects of having access to a Medicare-eligible hospital on Black out-of-hospital births by attendant type.[42] The results, reported in columns (2) and (3) of Table 6, suggest that the shift towards in-hospital births came entirely from out-of-hospital births attended by a midwife.[43] There is no evidence of a reduction in out-of-hospital births attended by a physician when Black mothers were given the option of delivering at a Medicare-eligible hospital.

During the period under study, midwives across the Deep South were required to be licensed (Anderson et al. forthcoming). According to contemporary accounts, licensing greatly improved the quality of midwifery services provided.[44] Nonetheless, midwives were not trained to

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delivered by midwives and 2.3 percent were delivered by "other" persons or persons for whom no status was specified (U.S. Department of Health, Education, and Welfare 1978).

[41] In Appendix Figure A7, we show event-study estimates of the effect of having access to a Medicare-eligible hospital on the in-hospital Black birth rate. There is strong evidence that the positive estimate reported in column (1) of Table 6 is a continuation of an upwards pre-treatment trend. In addition to estimating equation (4), we also explored the relationship between the federal effort to desegregate hospitals and the overall Black birth rate, defined as the number of live Black births per 100,000 Black population. We found no evidence that access to a Medicare-certified hospital affected the overall Black birth rate.

[42] Figure 9 shows out-of-hospital physician-attended birth rates by race; Figure 10 shows out-of-hospital midwife-attended birth rates by race.

[43] During this period, birth certificates recorded whether an out-of-hospital birth was attended by a physician, midwife, or other/not specified attendant (U.S. Department of Health, Education, and Welfare 1978). We included out-of-hospital births by "other/not specified" in the count of out-of-hospital births attended by a midwife. Based on our own calculations, over 90 percent of births in this combined category were attended by midwives. In Appendix Figure A8, we show event-study estimates of the effect of having access to a Medicare-certified hospital on Black births attended by a midwife. There is strong evidence that the negative estimate reported in column (3) of Table 6 is a continuation of a pre-treatment trend. In Appendix Figure A9, we use data from the National Health Interview Survey to examine past-year hospital admissions among infants. The Black-White difference in hospital admission rates began trending upward in 1964, peaked in 1966, and then leveled off.

[44] For instance, licensed midwives in South Carolina were required to attend a two-week course of instruction (South Carolina 1960). According to South Carolina public health officials, the licensing of midwives had a dramatic effect on both infant and maternal mortality among Blacks:

attend complicated pregnancies (Dodd 1920; Mongeau et al. 1961) and it is not unreasonable to expect that the shift to in-hospital births resulted in fewer mothers dying during childbirth.

In column (4) of Table 6, we report the estimated effect of having access to a Medicare-certified hospital on the maternal mortality rate in county c and year t.[45] The estimate, although negative, is small and statistically insignificant. Access is associated with a 0.018 reduction in the Black maternal mortality rate, which is less than two percent of the pre-treatment mean.[46]

5. CONCLUSION

According to Title VI of the Civil Rights Act of 1964, no person "on the ground of race, color, or national origin" should be denied the benefits of any program receiving federal financial assistance (U.S. Department of Labor n.d.). When the Civil Rights Act was passed, most U.S. hospitals did not rely on federal money and the discriminatory practices of Southern hospitals continued largely unabated. The landscape radically changed, however, when President Johnson signed Medicare into law on July 30, 1965, promising to generously pay for the health care of

> It is interesting to note that from 1919 to 1928, the last year for which we have figures tabulated separately for white and colored, there was a decided reduction in the colored rates [of death] for both infants and mothers although there was an increase in both rates for whites. This would seem to indicate that the instruction of midwives, who deliver most of the negro mothers, has not been without value to the State (South Carolina Board of Health (1932) cited in Bonaparte (2014, p. 172)).

[45] We measure the maternal mortality rate as deaths due to complications from pregnancy or childbirth per 1,000 live births. Maternal mortality counts included women in the "puerperal state," which lasted through pregnancy and continued for 42 days after delivery (Guyer et al. 2000). Because the maternal mortality rate is equal to zero for 78 percent of our county-year observations, we also estimated a Poisson regression model. The results from this exercise were qualitatively similar to those reported in Table 6.

[46] In an effort to study the effects of Black hospitals, we used data from Rice and Jones (1994), Wesley (2010), and a host of contemporary sources (available from the authors upon request) to distinguish between counties that were served by a Black hospital in the pre-treatment period and those that were not. Appendix Table A8 shows estimates obtained by interacting $Medicare_{ct}$ with an indicator, $Black\ Hospital_c$, that is equal to one if a county was served by at least one Black hospital in 1966 (and equal to zero otherwise). These estimates suggest that, regardless of whether county c was served by a Black hospital, gaining access to a Medicare-eligible hospital had no effect on where Black mothers chose to give birth or on Black infant mortality.

millions of people. The threat of withholding Medicare funding, coupled with the efforts of investigators from the newly created Office of Equal Health Opportunity who were tasked with identifying hospitals that were not in compliance with Title VI, led to the eventual desegregation of even the most notoriously segregated hospitals in the South (Associated Press 1969).

Focusing on one Deep South state, Mississippi, Almond et al. (2006) find that access to a Medicare-eligible hospital is associated with sharp reductions in Black postneonatal mortality, especially mortality due to causes considered preventable with timely hospital treatment. They conclude that, by prohibiting institutions that received federal funds from discriminating, the Civil Rights Act saved tens of thousands of Black infant lives. Aside from Almond et al. (2006), we know very little about the relationship between hospital desegregation and health.

Using county-level mortality data from five Deep South states and exploiting considerably more variation in Medicare certification dates than was available to Almond et al. (2006), we revisit the relationship between the federal hospital desegregation campaign and the Black IMR for the period 1959-1973. Consistent with Smith's (2005, p. 264) description of the hospital desegregation campaign as producing only "cosmetic" changes, our results suggest that having access to a Medicare-eligible hospital had little, if any, effect on infant mortality. Specifically, we find that having access to a certified hospital is associated with 1.37 additional Black infant deaths per 1,000 births. Although this estimate is not statistically significant, it is sufficiently precise to reject the hypothesis that the hospital desegregation campaign contributed meaningfully to the narrowing of the Black-White infant mortality gap. Likewise, we find that having access to a Medicare-eligible hospital had no appreciable effect on the Black PNMR, nor did it affect Black infant deaths due to preventable causes (i.e., pneumonia/influenza and diarrhea). Again, these estimates are measured with precision, allowing us to reject the hypothesis that the hospital desegregation campaign drove the narrowing of the Black-White postneonatal mortality gap.

Importantly, our results for the Deep South do not mask heterogeneity by state. After controlling for common trends, we find no evidence that the hospital desegregation campaign reduced the Black IMR in Alabama, Georgia, Louisiana, Mississippi, or South Carolina. In fact, three of these five estimates are actually positive, including the Mississippi estimate.

Finally, using newly transcribed data on live births by race, location (in-hospital versus out-of-hospital) and attendant type (physician versus midwife) available from annual state vital statistics reports, we explore whether the hospital desegregation campaign accelerated the trend towards in-hospital births among Southern Black mothers, which was originally documented by Chay and Greenstone (2000). We find that having access to a Medicare-eligible hospital is associated with an increase in the rate at which Black mothers chose to give birth in-hospital and a similarly sized decrease in out-of-hospital Black births attended by a midwife. These estimated effects are, however, not nearly large enough to explain the trend towards in-hospital births.

The effort to desegregate Southern hospitals was met with considerable resistance. Two hundred and fourteen hospitals in the South initially refused to integrate their facilities, forgoing all federal funding (Nash 1968; Reynolds 1997); ostensibly integrated hospitals openly flouted Title VI guidelines (U.S. House of Representatives 1973; Quadagno 2000); and Black patients were reticent to seek care at private hospitals that had, for generations, segregated or excluded them altogether (Comptroller General 1972; Quadagno 2000). Had the goals of the federal effort been embraced by White-run hospital administrators and physicians, its short-run effects on Black infant and maternal health may have been more pronounced than those we document above.

Our empirical strategy prevents us from exploring the longer-run effects of the hospital desegregation campaign but it is worth noting that the Black-White infant mortality gap has been closing steadily in several Southern states over the past two decades (Speights et al. 2017). This progress may have been impossible had investigators from the OEHO not compelled Southern

hospitals to abandon their long-standing discriminatory practices. Identifying the factors that contributed—and continue to contribute—to the narrowing of the Black-White infant mortality gap will depend on identifying well-defined natural experiments and carefully accounting for secular trends.

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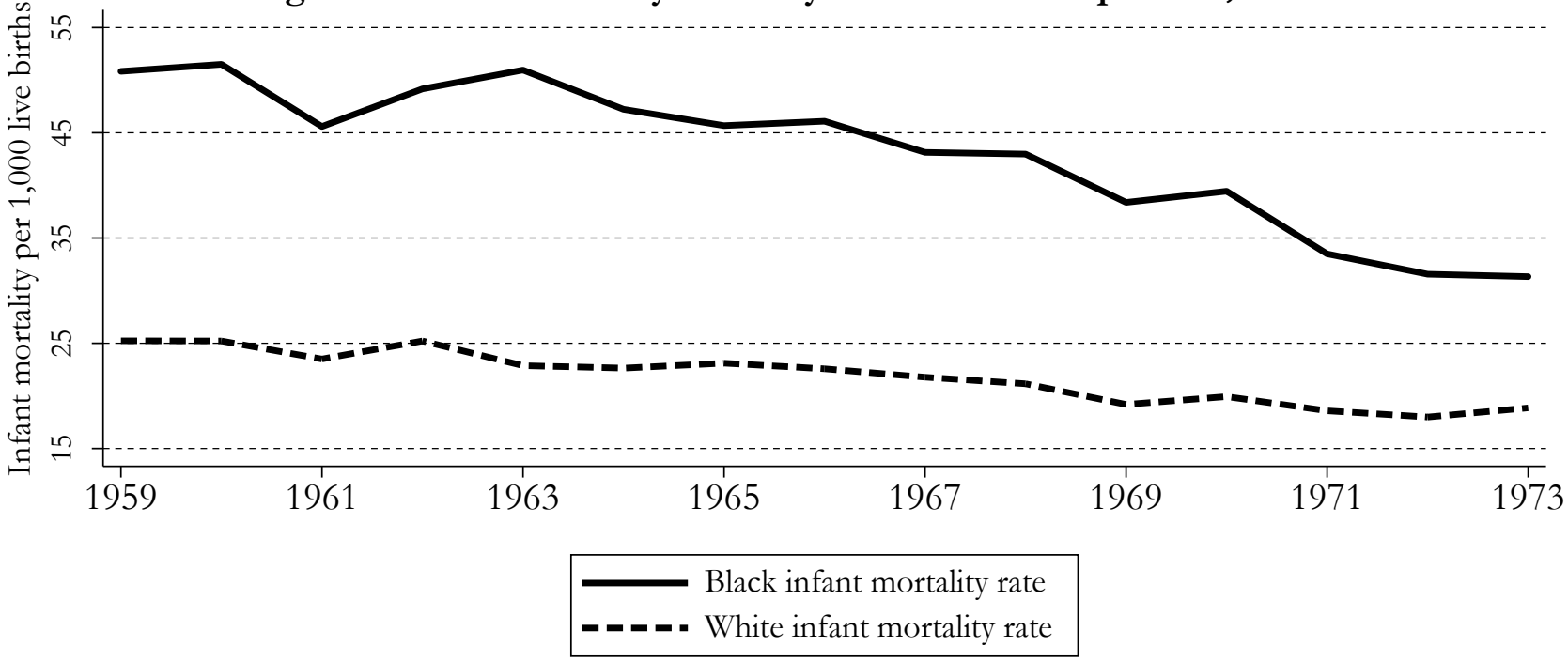
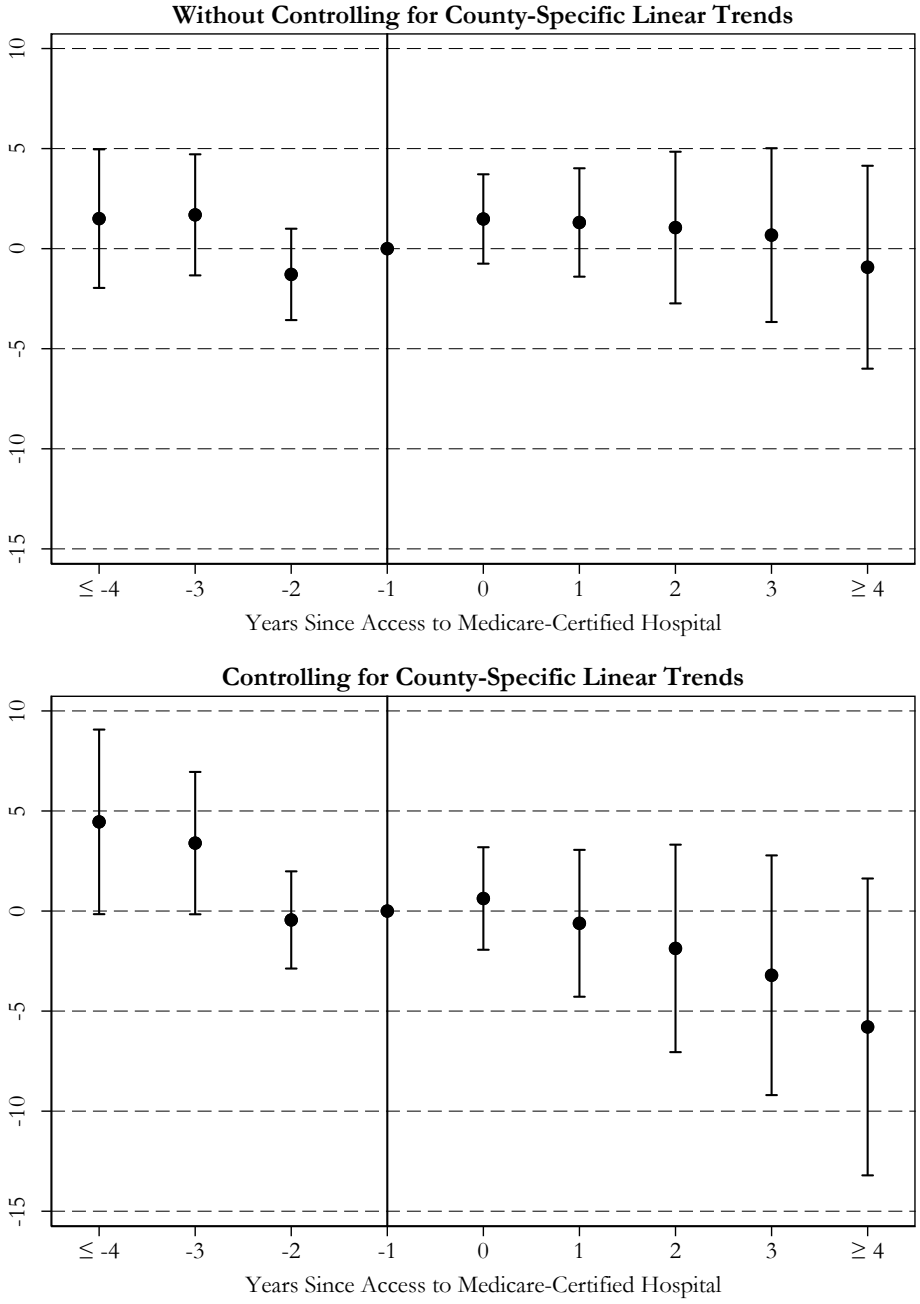
Figure 1. Infant Mortality Rates by Race in the Deep South, 1959-1973



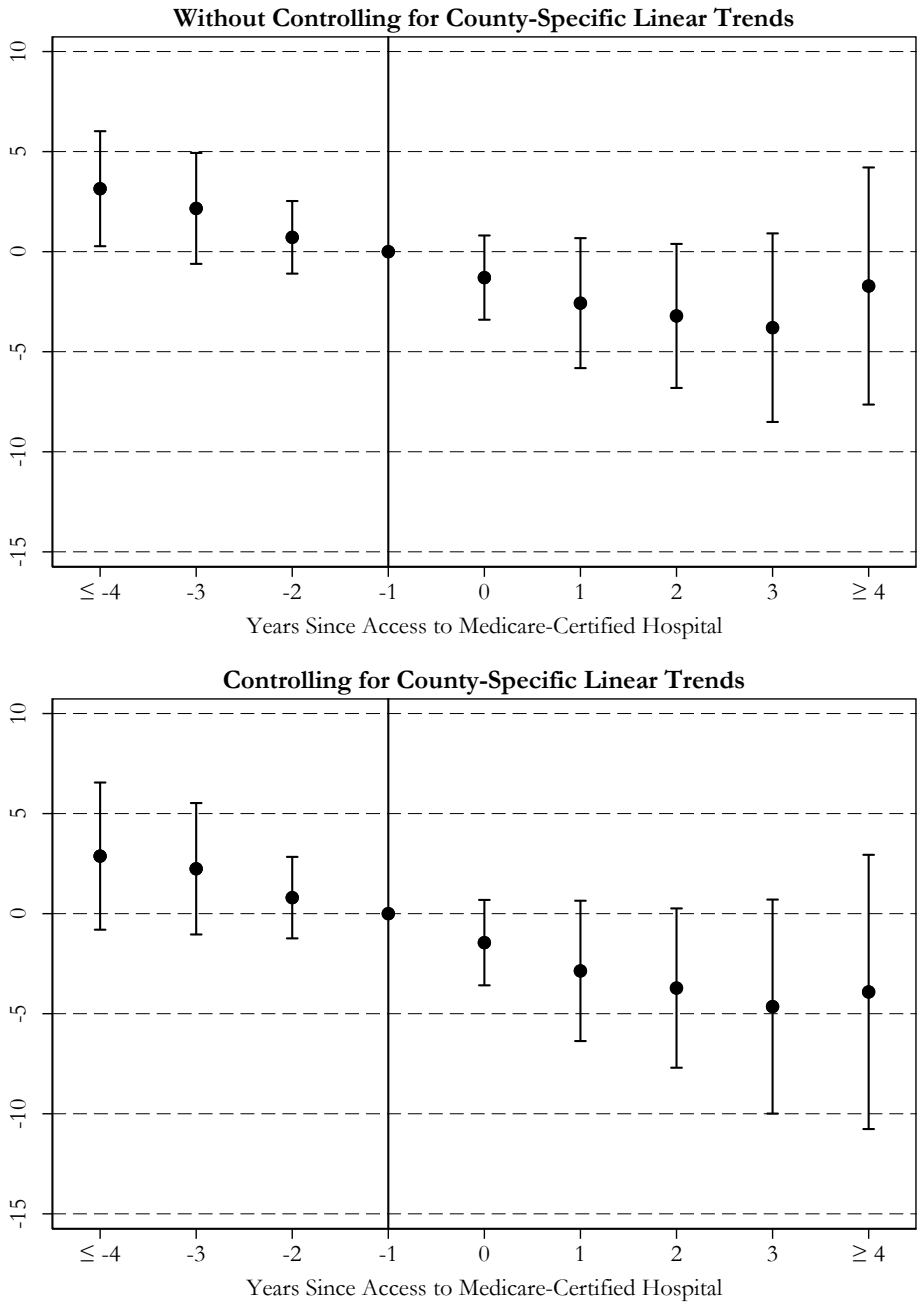
Notes: Based on annual data from the Multiple Cause-of-Death Mortality Files, published by the National Vital Statistics System.

Figure 2. Pre- and Post-Treatment Trends in Black Infant Mortality



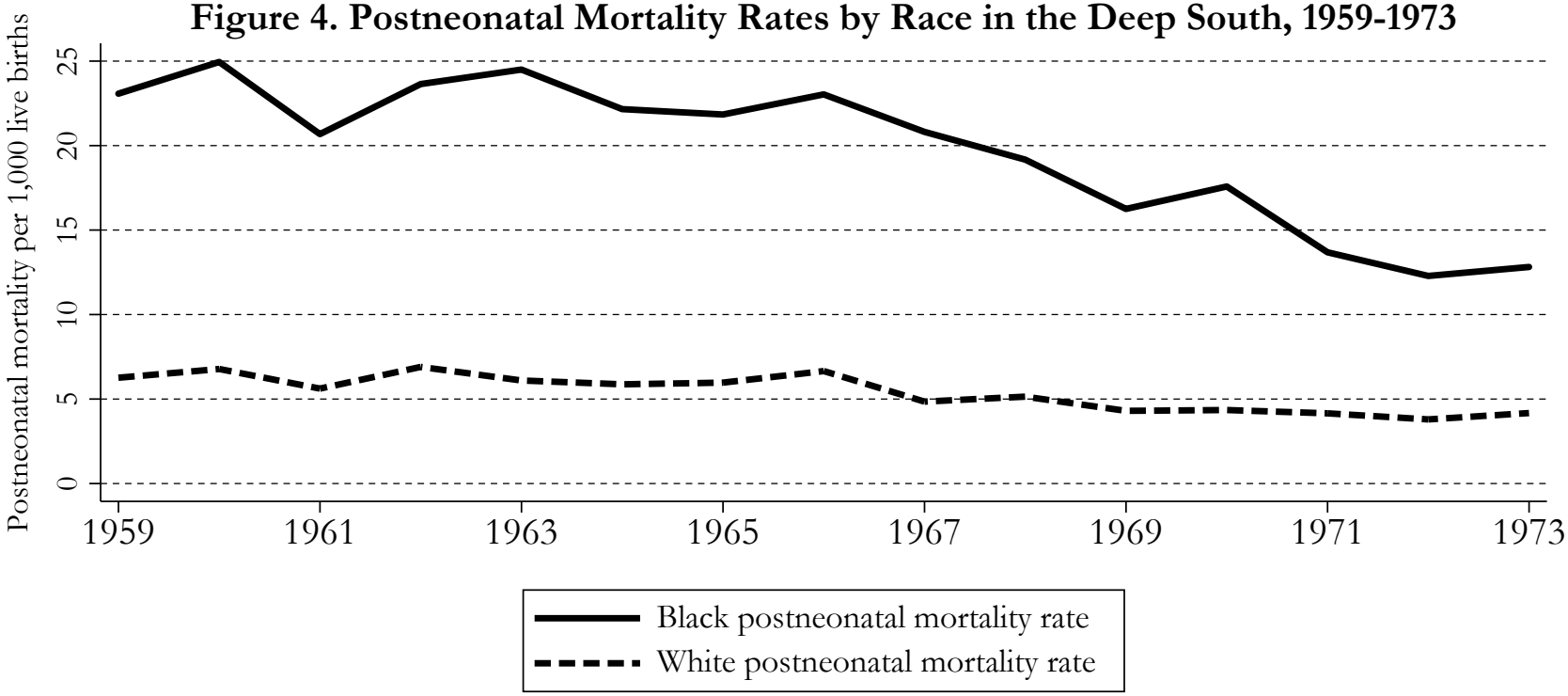
Notes: OLS coefficient estimates (and their 90% confidence intervals) are reported, where the omitted category is one year before treatment. The dependent variable is equal to the number of Black infant deaths per 1,000 live Black births in county *c* and year *t*. All models control for the county-level covariates listed in Appendix Table A2, county fixed and year fixed effects. Regressions are weighted by live Black births. Standard errors are corrected for clustering at the county level.

Figure 3. Pre- and Post-Treatment Trends in White Infant Mortality



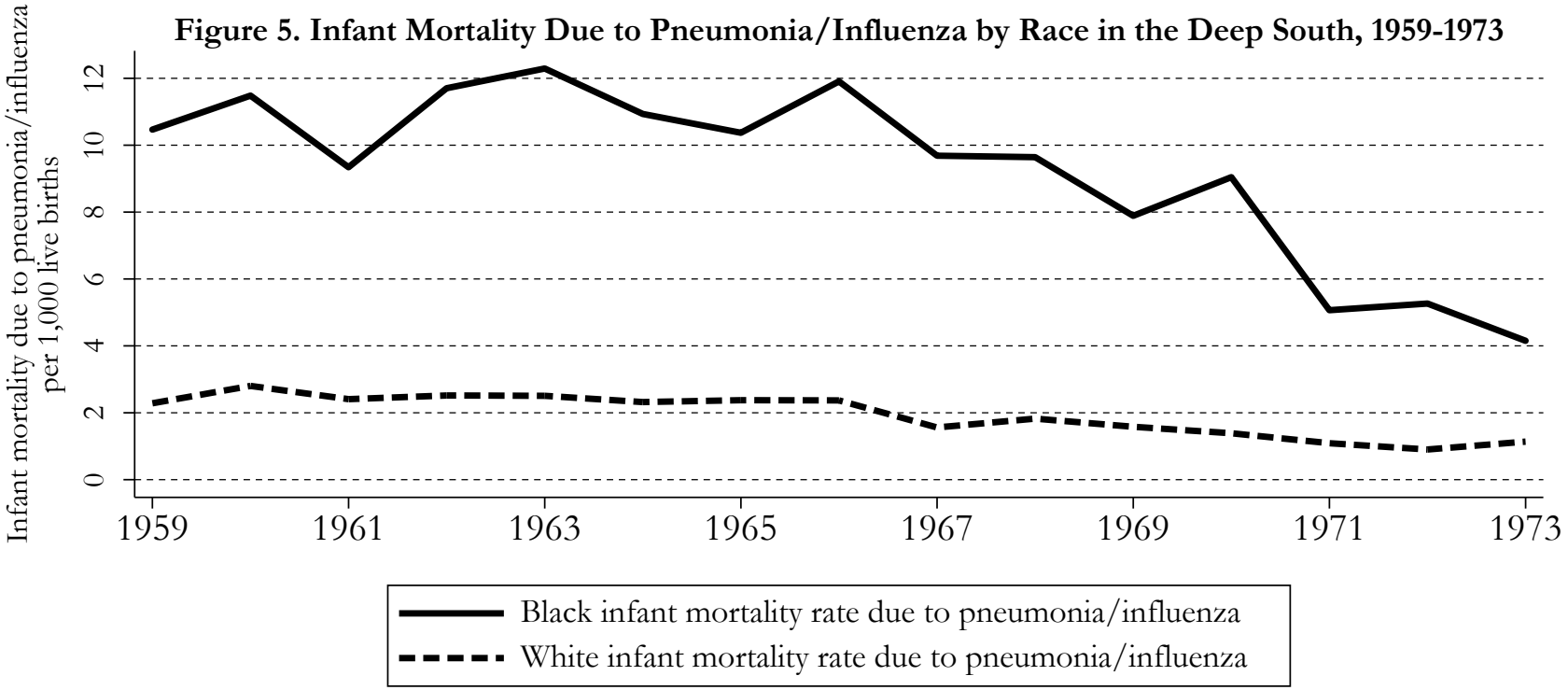
Notes: OLS coefficient estimates (and their 90% confidence intervals) are reported, where the omitted category is one year before treatment. The dependent variable is equal to the number of White infant deaths per 1,000 live White births in county *c* and year *t*. All models control for the county-level covariates listed in Appendix Table A2, county fixed and year fixed effects. Regressions are weighted by live White births. Standard errors are corrected for clustering at the county level.

Figure 4. Postneonatal Mortality Rates by Race in the Deep South, 1959-1973



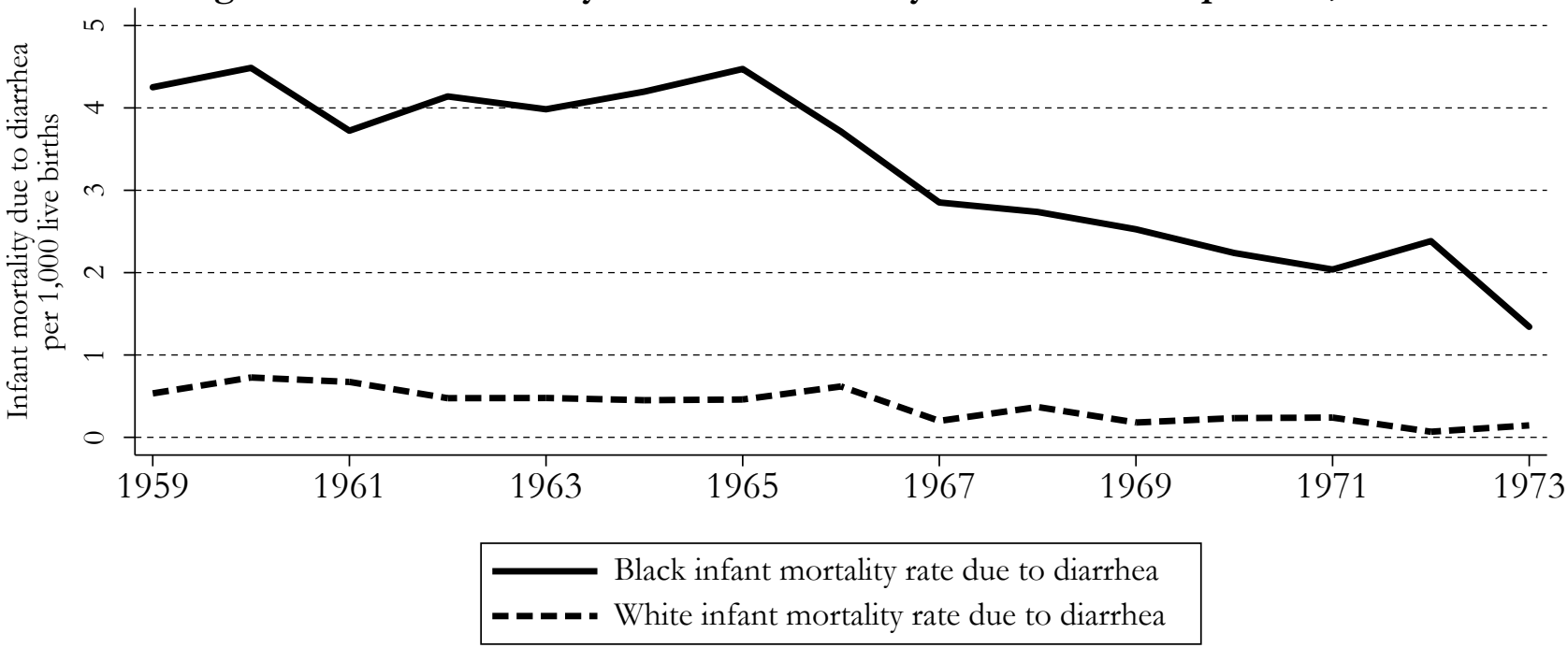
Notes: Based on annual data from the Multiple Cause-of-Death Mortality Files, published by the National Vital Statistics System.

Figure 5. Infant Mortality Due to Pneumonia/Influenza by Race in the Deep South, 1959-1973



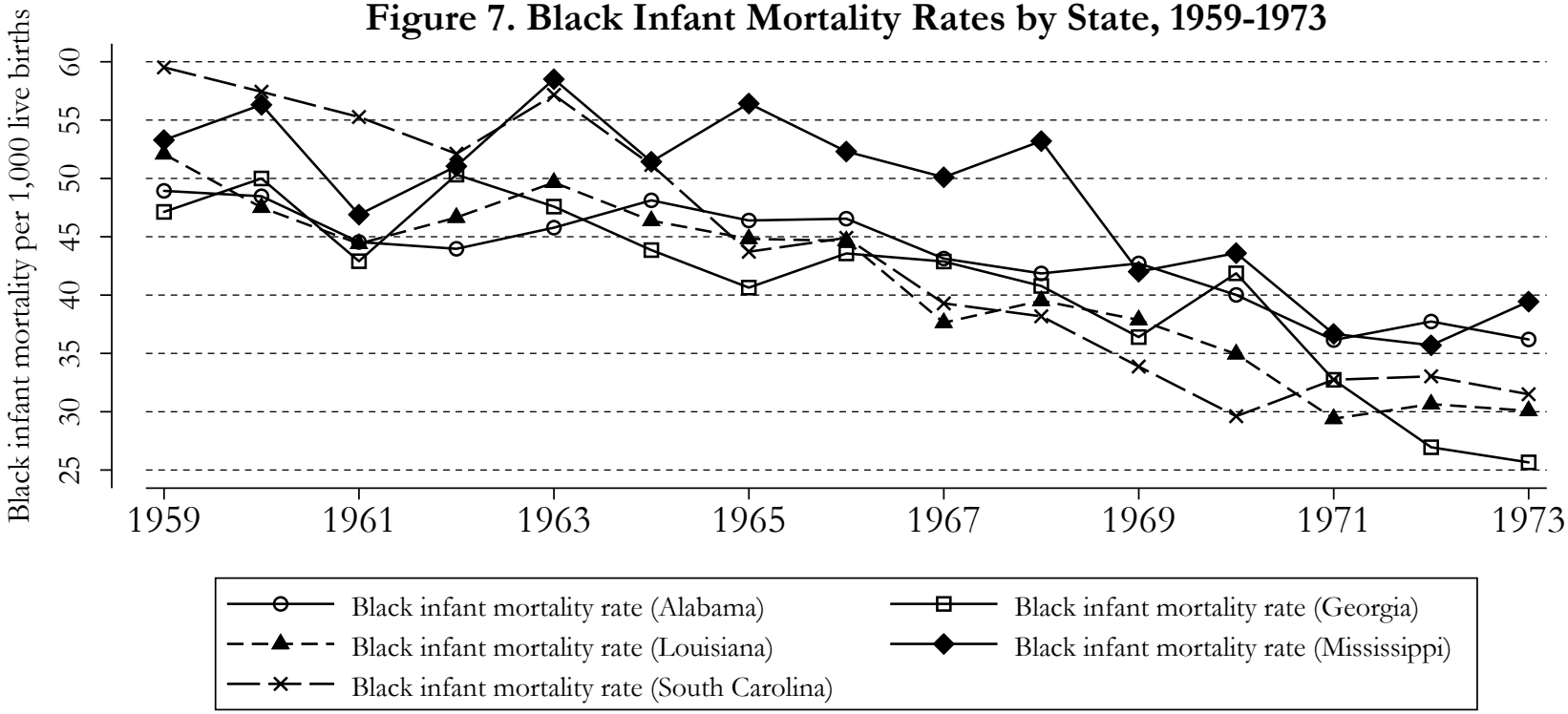
Notes: Based on annual data from the Multiple Cause-of-Death Mortality Files, published by the National Vital Statistics System.

Figure 6. Infant Mortality Due to Diarrhea by Race in the Deep South, 1959-1973



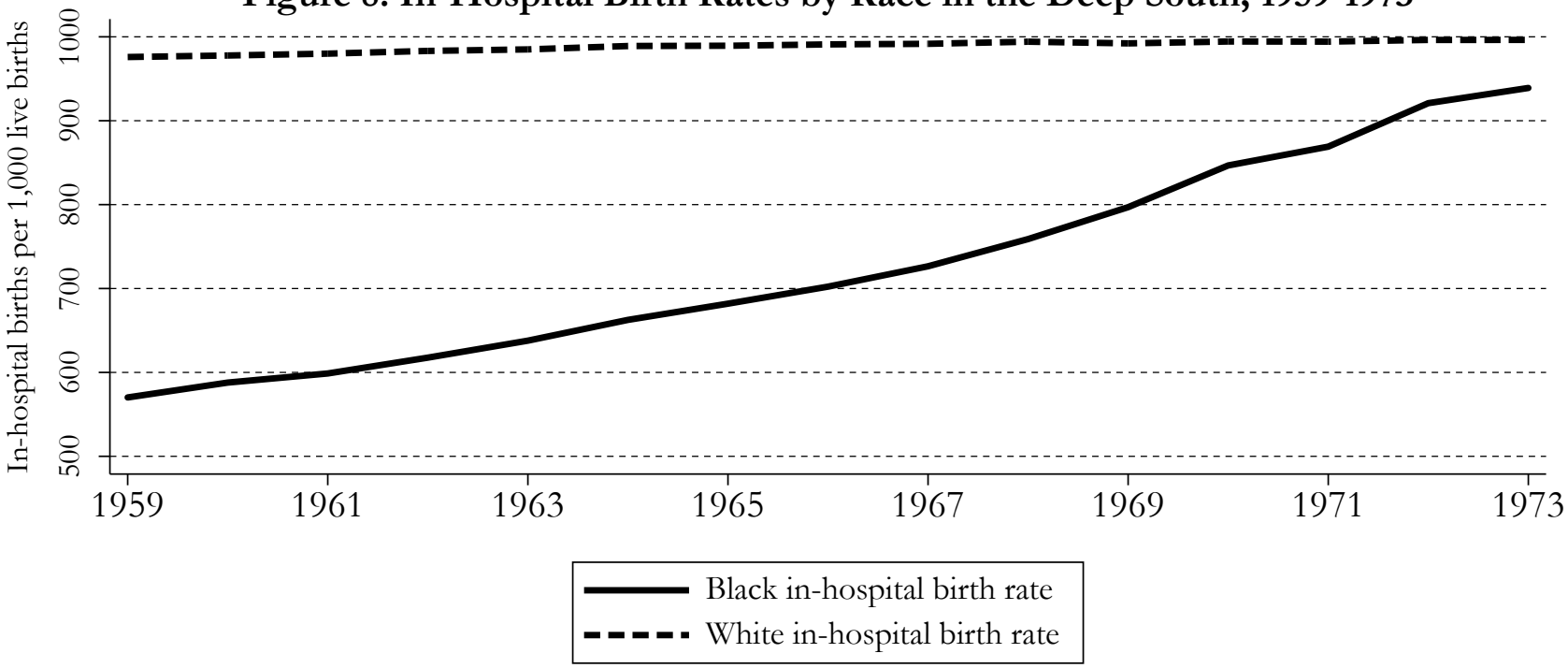
Notes: Based on annual data from the Multiple Cause-of-Death Mortality Files, published by the National Vital Statistics System.

Figure 7. Black Infant Mortality Rates by State, 1959-1973



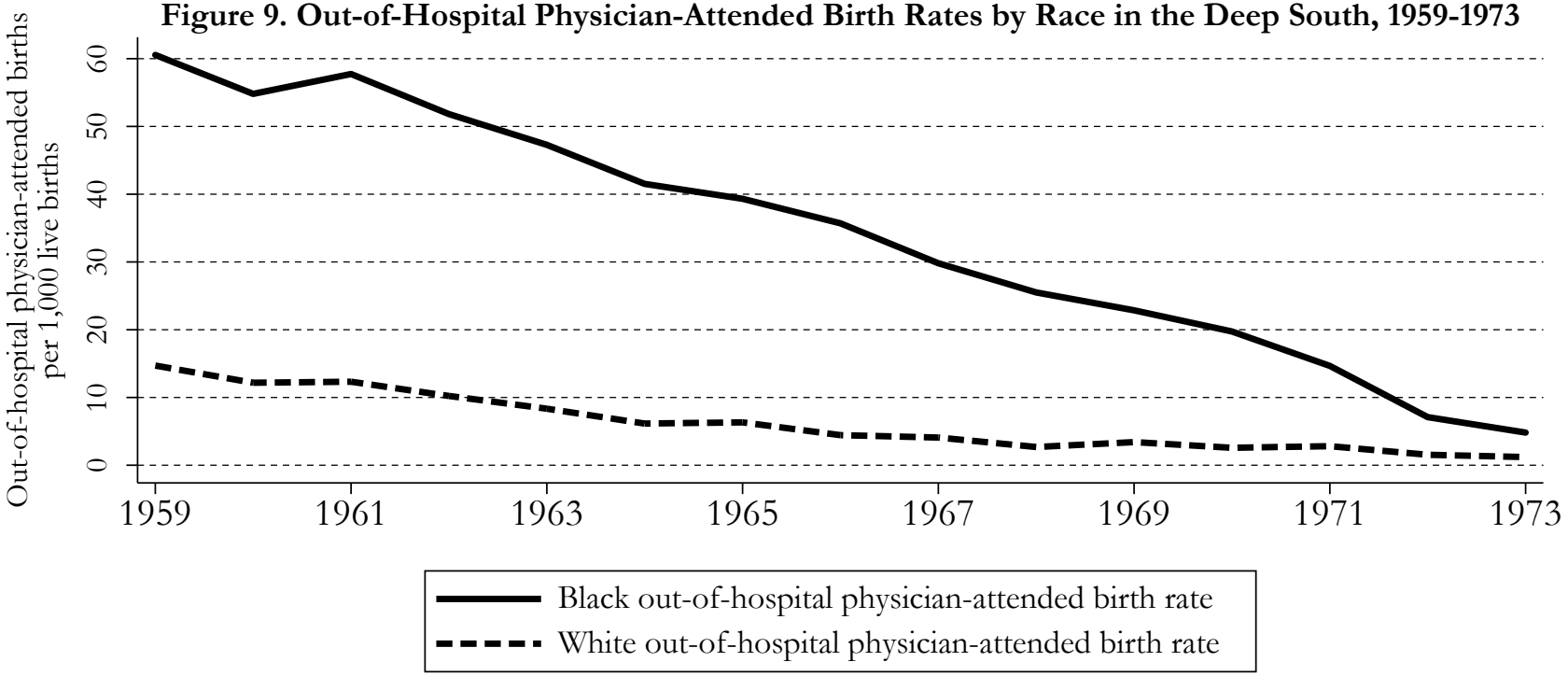
Notes: Based on annual data from the Multiple Cause-of-Death Mortality Files, published by the National Vital Statistics System.

Figure 8. In-Hospital Birth Rates by Race in the Deep South, 1959-1973



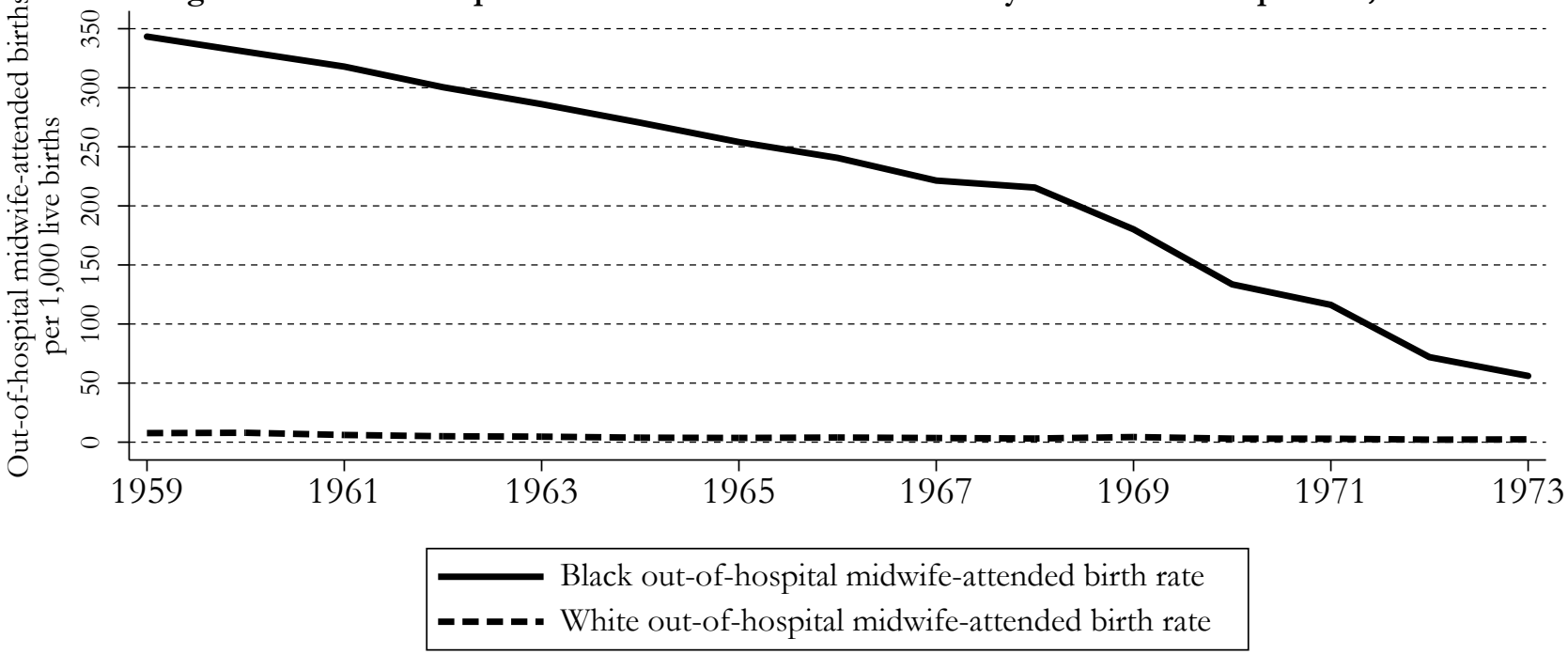
Notes: Based on annual data from the Natality Files, published by the National Vital Statistics System.

Figure 9. Out-of-Hospital Physician-Attended Birth Rates by Race in the Deep South, 1959-1973



Notes: Based on annual data from the Natality Files, published by the National Vital Statistics System.

Figure 10. Out-of-Hospital Midwife-Attended Birth Rates by Race in the Deep South, 1959-1973



Notes: Based on annual data from the Natality Files, published by the National Vital Statistics System.

Table 1. The Effect of the Hospital Desegregation Campaign on Infant Mortality by Race, 1959-1973

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Black Infant Mortality	*Black Infant Mortality*	*Black Infant Mortality*	*Black Infant Mortality*	*White Infant Mortality*	*White Infant Mortality*	*White Infant Mortality*	*White Infant Mortality*
Medicare	-13.3***	1.69	1.63	1.37	-4.92***	-2.45	-2.32	-2.01
	(.720)	(1.24)	(1.24)	(1.44)	(.339)	(1.54)	(1.47)	(1.28)
Pre-treatment mean	47.8	47.8	47.8	47.8	23.5	23.5	23.5	23.5
N	6,033	6,033	6,033	6,033	6,033	6,033	6,033	6,033
R^2	.192	.246	.247	.368	.098	.121	.122	.261
Year fixed effects	No	Yes	Yes	Yes	No	Yes	Yes	Yes
County-level covariates	No	No	Yes	Yes	No	No	Yes	Yes
County-specific linear trend	No	No	No	Yes	No	No	No	Yes

*Statistically significant at 10% level; ** at 5% level; *** at 1% level.

Notes: Based on annual data from the Multiple Cause-of-Death Mortality Files, published by the National Vital Statistics System. Each column represents results from a separate OLS regression. The dependent variable is equal to the number of infant deaths per 1,000 race-specific live births in county *c* and year *t*. All models control for county fixed effects. Regressions are weighted by race-specific live births. Standard errors, corrected for clustering at the county level, are in parentheses.

Table 2. The Effect of the Hospital Desegregation Campaign on Infant Mortality by Race, 1959-1973: Event-Study Estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Black Infant Mortality	*Black Infant Mortality*	*Black Infant Mortality*	*Black Infant Mortality*	*White Infant Mortality*	*White Infant Mortality*	*White Infant Mortality*	*White Infant Mortality*
4+ Years Before Medicare	6.08***	1.41	1.50	4.46	3.14***	3.36*	3.15*	2.88
	(1.06)	(2.11)	(2.10)	(2.80)	(.503)	(1.71)	(1.74)	(2.23)
3 Years Before Medicare	3.66***	1.63	1.69	3.40	2.11***	2.30	2.16	2.24
	(1.20)	(1.84)	(1.84)	(2.16)	(.617)	(1.66)	(1.68)	(1.99)
2 Years Before Medicare	.911	-1.32	-1.29	-.445	1.36***	.785	.716	.801
	(.865)	(1.39)	(1.38)	(1.47)	(.434)	(1.10)	(1.10)	(1.23)
1 Year Before Medicare	…	…	…	…	…	…	…	…
Year of Medicare Certification	-3.21***	1.52	1.48	.627	-.730	-1.36	-1.30	-1.45
	(.824)	(1.36)	(1.35)	(1.55)	(.491)	(1.30)	(1.28)	(1.29)
1 Year After Medicare	-4.34***	1.38	1.31	-.613	-1.10**	-2.70	-2.57	-2.86
	(.876)	(1.64)	(1.64)	(2.23)	(.495)	(2.01)	(1.97)	(2.13)
2 Years After Medicare	-7.02***	1.17	1.05	-1.87	-2.19***	-3.37	-3.21	-3.72
	(.888)	(2.29)	(2.30)	(3.14)	(.511)	(2.26)	(2.18)	(2.41)
3 Years After Medicare	-9.11***	.845	.677	-3.21	-2.77***	-3.98	-3.80	-4.64
	(.914)	(2.63)	(2.63)	(3.63)	(.510)	(2.95)	(2.86)	(3.24)
4+ Years After Medicare	-13.3***	-.662	-.927	-5.79	-3.66***	-1.92	-1.72	-3.91
	(.805)	(3.09)	(3.07)	(4.50)	(.462)	(3.71)	(3.59)	(4.16)
p-value (joint significance of lags)	.000	.841	.833	.598	.000	.013	.016	.226
Pre-treatment mean	47.8	47.8	47.8	47.8	23.5	23.5	23.5	23.5
N	6,033	6,033	6,033	6,033	6,033	6,033	6,033	6,033
R^2	.238	.246	.247	.369	.118	.123	.124	.262
Year fixed effects	No	Yes	Yes	Yes	No	Yes	Yes	Yes
County-level covariates	No	No	Yes	Yes	No	No	Yes	Yes
County-specific linear trend	No	No	No	Yes	No	No	No	Yes

*Statistically significant at 10% level; ** at 5% level; *** at 1% level.

Notes: Based on annual data from the Multiple Cause-of-Death Mortality Files, published by the National Vital Statistics System. Each column represents results from a separate OLS regression, where the omitted category is 1 year before treatment. The dependent variable is equal to the number of infant deaths per 1,000 race-specific live births in county *c* and year *t*. All models control for county fixed effects. Regressions are weighted by race-specific live births. Standard errors, corrected for clustering at the county level, are in parentheses.

Table 3. The Effect of the Hospital Desegregation Campaign on Black Neonatal, Postneonatal, and Infant Mortality by Cause, 1959-1973

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Black Neonatal Mortality	*Black Neonatal Mortality*	*Black Postneonatal Mortality*	*Black Postneonatal Mortality*	*Black Infant Mortality Due to Pneumonia/ Influenza*	*Black Infant Mortality Due to Pneumonia/ Influenza*	*Black Infant Mortality Due to Diarrhea*	*Black Infant Mortality Due to Diarrhea*
Medicare	.414	.189	1.22	1.18	.728	.723	.344	.238
	(.875)	(1.02)	(.888)	(1.01)	(.712)	(.698)	(.369)	(.399)
Pre-treatment mean	26.8	26.8	21.0	21.0	9.57	9.57	3.69	3.69
N	6,033	6,033	6,033	6,033	6,033	6,033	6,033	6,033
R^2	.106	.212	.208	.327	.132	.247	.088	.182
County-specific linear trend	No	Yes	No	Yes	No	Yes	No	Yes

*Statistically significant at 10% level; ** at 5% level; *** at 1% level.

Notes: Based on annual data from the Multiple Cause-of-Death Mortality Files, published by the National Vital Statistics System. Each column represents results from a separate OLS regression. The dependent variable is equal to the number of specified Black deaths per 1,000 live Black births in county *c* and year *t*. All models control for the county-level covariates listed in Appendix Table A2, county fixed effects and year fixed effects. Regressions are weighted by live Black births. Standard errors, corrected for clustering at the county level, are in parentheses.

Table 4. Extensions and Robustness Checks: The Effect of the Hospital Desegregation Campaign on Black Infant Mortality, 1959-1973

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Alternative treatment thresholds			Early adopters vs. holdouts	Drop no-hospital counties	Medicare-certified counties on border	Goodman-Bacon (2020) Detrend	Control for state-by-year fixed effects	Unweighted	Interaction between *Medicare* and *Medicaid*
Medicare – 25% of Beds	1.66	…	…	…	…	…	…	…	…	…
	(1.34)									
Medicare – 50% of Beds	…	.509	…	…	…	…	…	…	…	…
		(1.18)								
Medicare – 75% of Beds	…	…	-.266	…	…	…	…	…	…	…
			(1.07)							
Medicare – 1967	…	…	…	1.96	…	…	…	…	…	…
				(1.72)						
Medicare – 1968 or later	…	…	…	.880	…	…	…	…	…	…
				(1.88)						
Medicare	…	…	…	…	1.04	1.54	-.218	1.92	.961	1.49
					(1.45)	(1.44)	(1.28)	(1.56)	(3.01)	(1.50)
Number of Medicare-Certified Counties on Border	…	…	…	…	…	-.427	…	…	…	…
						(.367)				
*Medicare*Medicaid*	…	…	…	…	…	…	…	…	…	-.296
										(.923)
Pre-treatment mean	47.8	47.8	47.8	47.8	47.7	47.8	51.9	47.8	48.2	47.8
N	6,033	6,033	6,033	6,033	4,913	6,033	6,033	6,033	6,033	6,033
R^2	.369	.368	.368	.368	.401	.369	.087	.387	.149	.368
County-specific linear trend	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes

*Statistically significant at 10% level; ** at 5% level; *** at 1% level.

Notes: Based on annual data from the Multiple Cause-of-Death Mortality Files, published by the National Vital Statistics System. Each column represents results from a separate OLS regression. The dependent variable is equal to the number of Black infant deaths per 1,000 live Black births in county *c* and year *t*. All models control for the county-level covariates listed in Appendix Table A2, county fixed effects and year fixed effects. Unless specified otherwise, regressions are weighted by live Black births. Standard errors, corrected for clustering at the county level, are in parentheses.

Table 5. The Effect of the Hospital Desegregation Campaign on Black Infant Mortality by State, 1959-1973

	(1)	(2)	(3)	(4)	(5)
	Alabama	Georgia	Louisiana	Mississippi	South Carolina
Medicare	7.87*	-4.30	5.45	3.53	-2.64
	(4.25)	(3.48)	(3.29)	(2.47)	(3.76)
Pre-treatment mean	44.1	44.5	44.7	52.7	55.5
N	869	2,284	960	1,230	690
R^2	.269	.253	.422	.337	.655

*Statistically significant at 10% level; ** at 5% level; *** at 1% level.

Notes: Based on annual data from the Multiple Cause-of-Death Mortality Files, published by the National Vital Statistics System. Each column represents results from a separate OLS regression. The dependent variable is equal to the number of Black infant deaths per 1,000 live Black births in county *c* and year *t*. All models control for the county-level covariates listed in Appendix Table A2, county fixed effects, year fixed effects and county-specific linear trends. Regressions are weighted by live Black births. Standard errors, corrected for clustering at the county level, are in parentheses.

Table 6. Black Births by Location/Attendant and Maternal Mortality, 1959-1973

	(1)	(2)	(3)	(4)
	In-Hospital Black Births	*Out-of-Hospital Black Births by Physicians*	*Out-of-Hospital Black Births by Midwives*	*Black Maternal Mortality*
Medicare	32.0***	.450	-32.5***	-.018
	(10.5)	(2.97)	(11.5)	(.215)
Pre-treatment mean	727.2	37.1	235.7	1.16
N	5,164	5,164	5,164	6,033
R^2	.838	.572	.823	.110

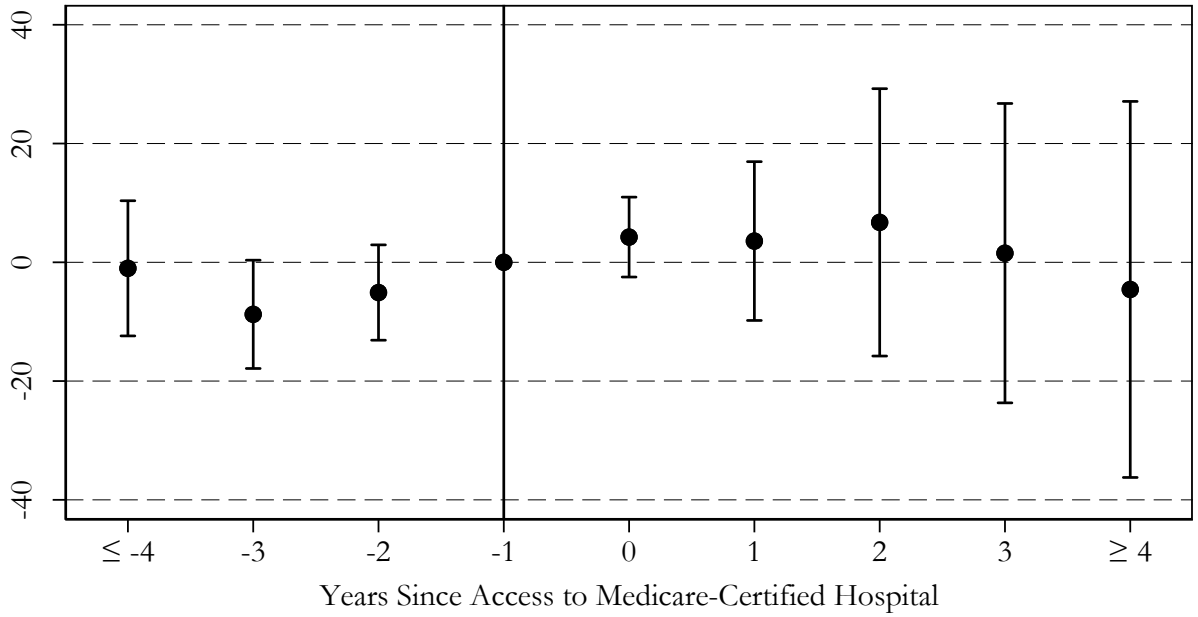
*Statistically significant at 10% level; ** at 5% level; *** at 1% level.

Notes: The results in columns (1)-(3) are based on annual data from individual state vital statistics reports and the Natality Files, published by the National Vital Statistics System. The results in column (4) are based on annual data from the Multiple Cause-of-Death Mortality Files, published by the National Vital Statistics System. Each column represents results from a separate OLS regression. In columns (1)-(3), the dependent variable is equal to the number of live Black births by location and attendant per 1,000 live Black births in county *c* and year *t*. In column (4), the dependent variable is equal to the number of Black maternal deaths per 1,000 live Black births in county *c* and year *t*. All models control for the county-level covariates listed in Appendix Table A2, county fixed effects, year fixed effects and county-specific linear trends. Regressions are weighted by live Black births. Standard errors, corrected for clustering at the county level, are in parentheses.

Appendix A

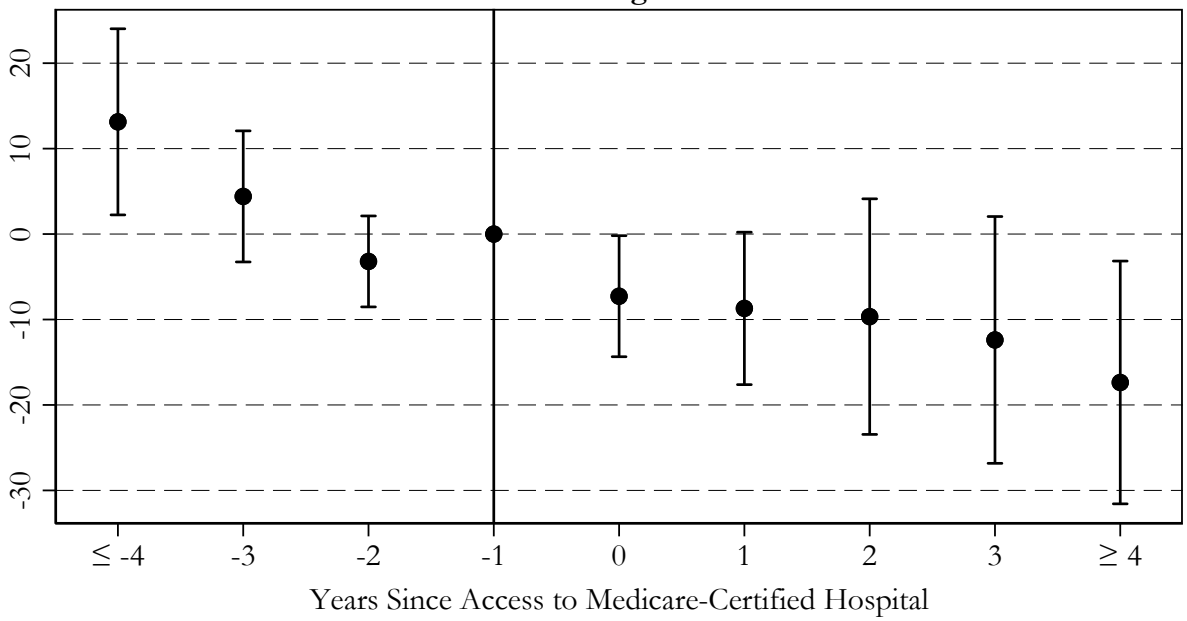
For Online Publication

Appendix Figure A1. Pre- and Post-Treatment Trends in Black Infant Mortality -Alabama-



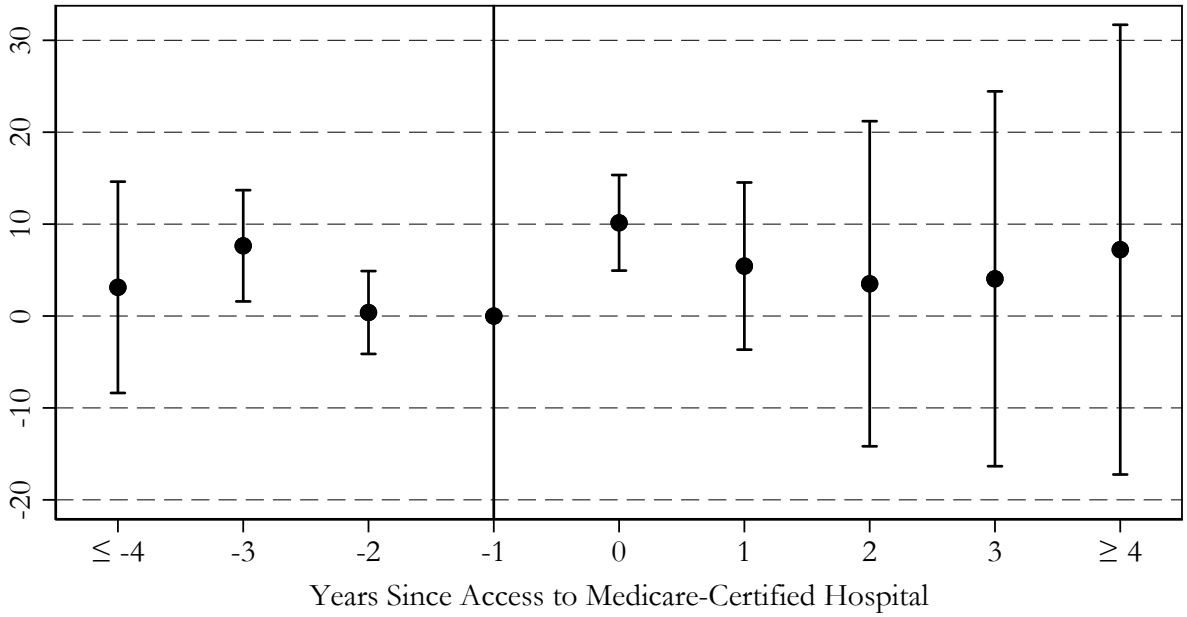
Notes: OLS coefficient estimates (and their 90% confidence intervals) are reported, where the omitted category is one year before treatment. The dependent variable is equal to the number of Black infant deaths per 1,000 live Black births in county *c* and year *t*. Controls include the county-level covariates listed in Appendix Table A2, county fixed effects, year fixed effects and county-specific linear trends. The regression is weighted by live Black births. Standard errors are corrected for clustering at the county level.

Appendix Figure A2. Pre- and Post-Treatment Trends in Black Infant Mortality -Georgia-



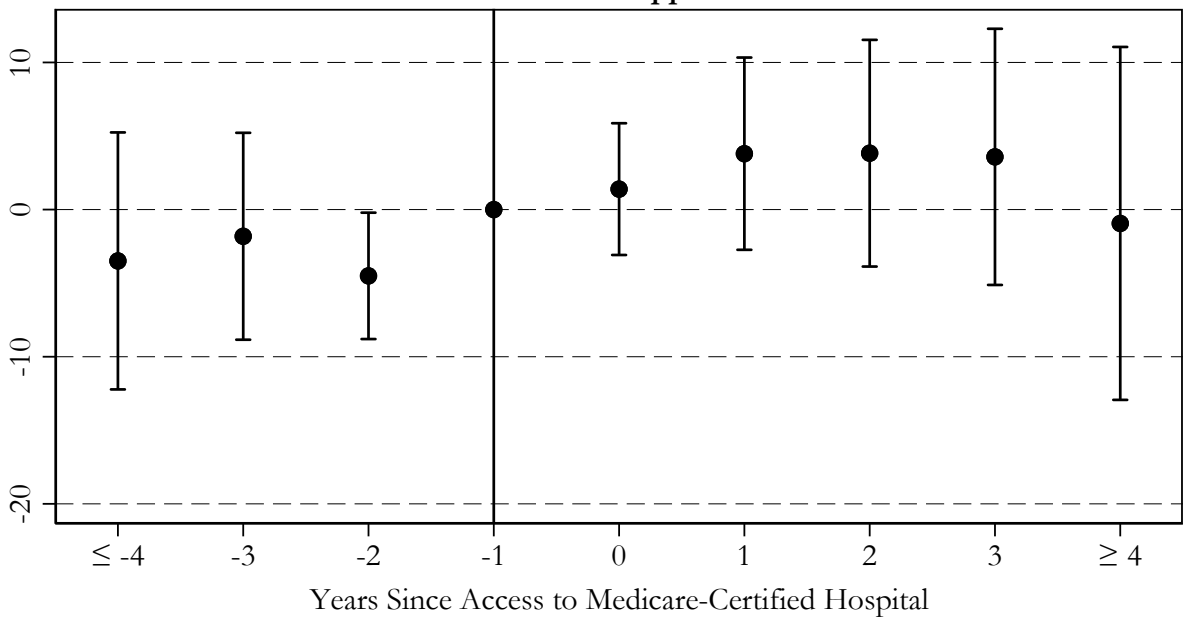
Notes: OLS coefficient estimates (and their 90% confidence intervals) are reported, where the omitted category is one year before treatment. The dependent variable is equal to the number of Black infant deaths per 1,000 live Black births in county *c* and year *t*. Controls include the county-level covariates listed in Appendix Table A2, county fixed effects, year fixed effects and county-specific linear trends. The regression is weighted by live Black births. Standard errors are corrected for clustering at the county level.

Appendix Figure A3. Pre- and Post-Treatment Trends in Black Infant Mortality -Louisiana-



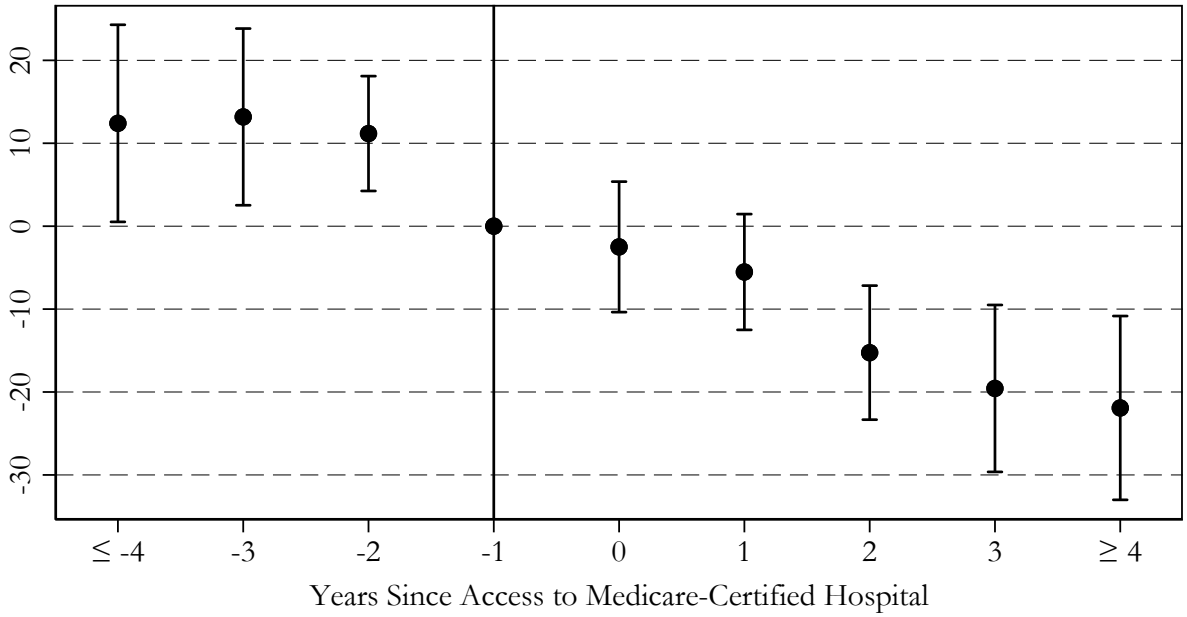
Notes: OLS coefficient estimates (and their 90% confidence intervals) are reported, where the omitted category is one year before treatment. The dependent variable is equal to the number of Black infant deaths per 1,000 live Black births in county *c* and year *t*. Controls include the county-level covariates listed in Appendix Table A2, county fixed effects, year fixed effects and county-specific linear trends. The regression is weighted by live Black births. Standard errors are corrected for clustering at the county level.

Appendix Figure A4. Pre- and Post-Treatment Trends in Black Infant Mortality -Mississippi-



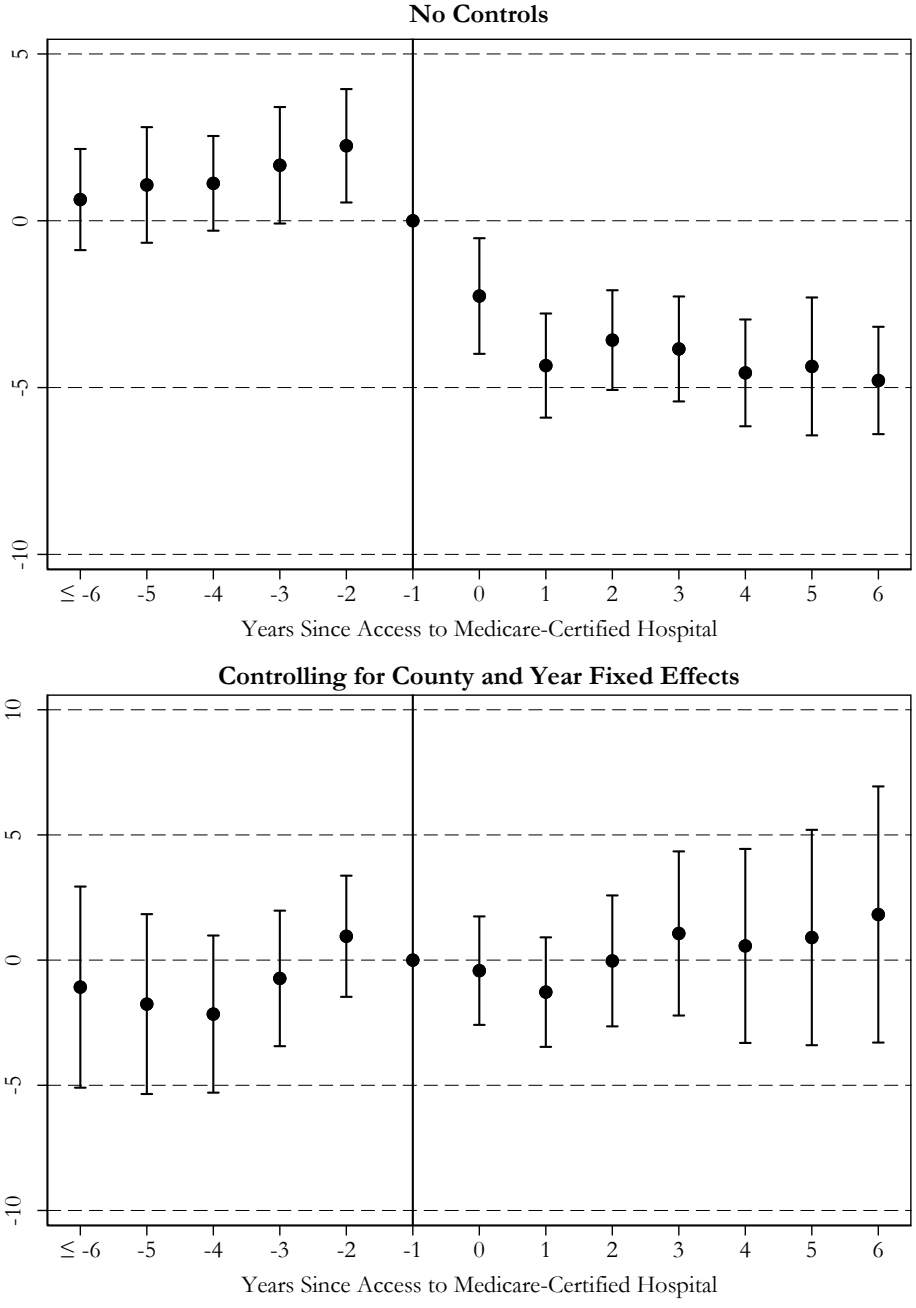
Notes: OLS coefficient estimates (and their 90% confidence intervals) are reported, where the omitted category is one year before treatment. The dependent variable is equal to the number of Black infant deaths per 1,000 live Black births in county *c* and year *t*. Controls include the county-level covariates listed in Appendix Table A2, county fixed effects, year fixed effects and county-specific linear trends. The regression is weighted by live Black births. Standard errors are corrected for clustering at the county level.

Appendix Figure A5. Pre- and Post-Treatment Trends in Black Infant Mortality
-South Carolina-



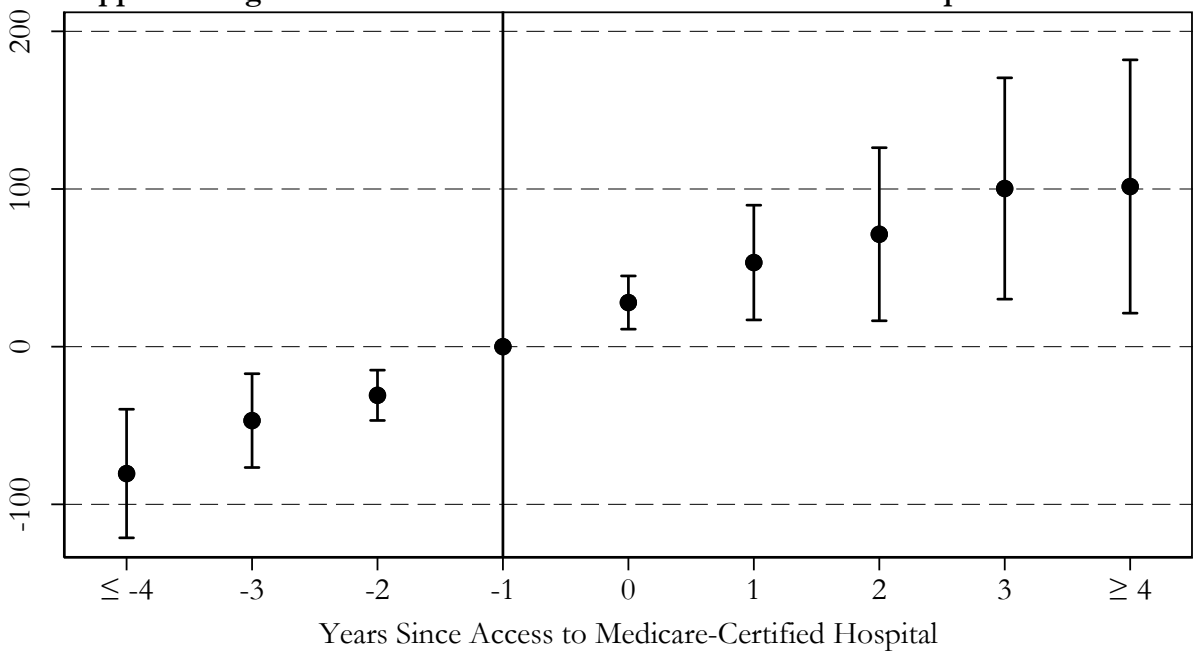
Notes: OLS coefficient estimates (and their 90% confidence intervals) are reported, where the omitted category is one year before treatment. The dependent variable is equal to the number of Black infant deaths per 1,000 live Black births in county *c* and year *t*. Controls include the county-level covariates listed in Appendix Table A2, county fixed effects, year fixed effects and county-specific linear trends. The regression is weighted by live Black births. Standard errors are corrected for clustering at the county level.

Appendix Figure A6. Replicating and Extending Event-Study Estimates from Almond et al. (2006) on Black-White Difference in Postneonatal Mortality Rates due to Pneumonia, Influenza, and Diarrhea in Mississippi



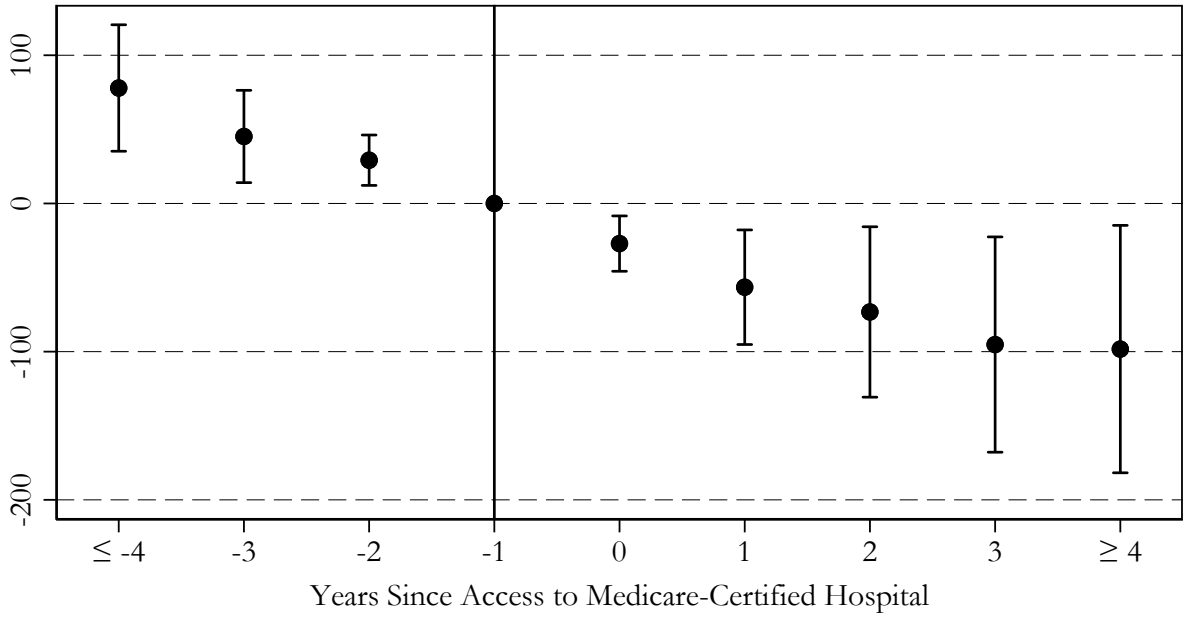
Notes: OLS coefficient estimates (and their 90% confidence intervals) are reported, where the omitted category is one year before treatment. The dependent variable is equal to the Black-White difference in postneonatal mortality rates due to pneumonia, influenza, and diarrhea in county *c* and year *t*. Regressions are weighted by live Black births. Standard errors are corrected for clustering at the county level.

Appendix Figure A7. Pre- and Post-Treatment Trends in In-Hospital Black Births



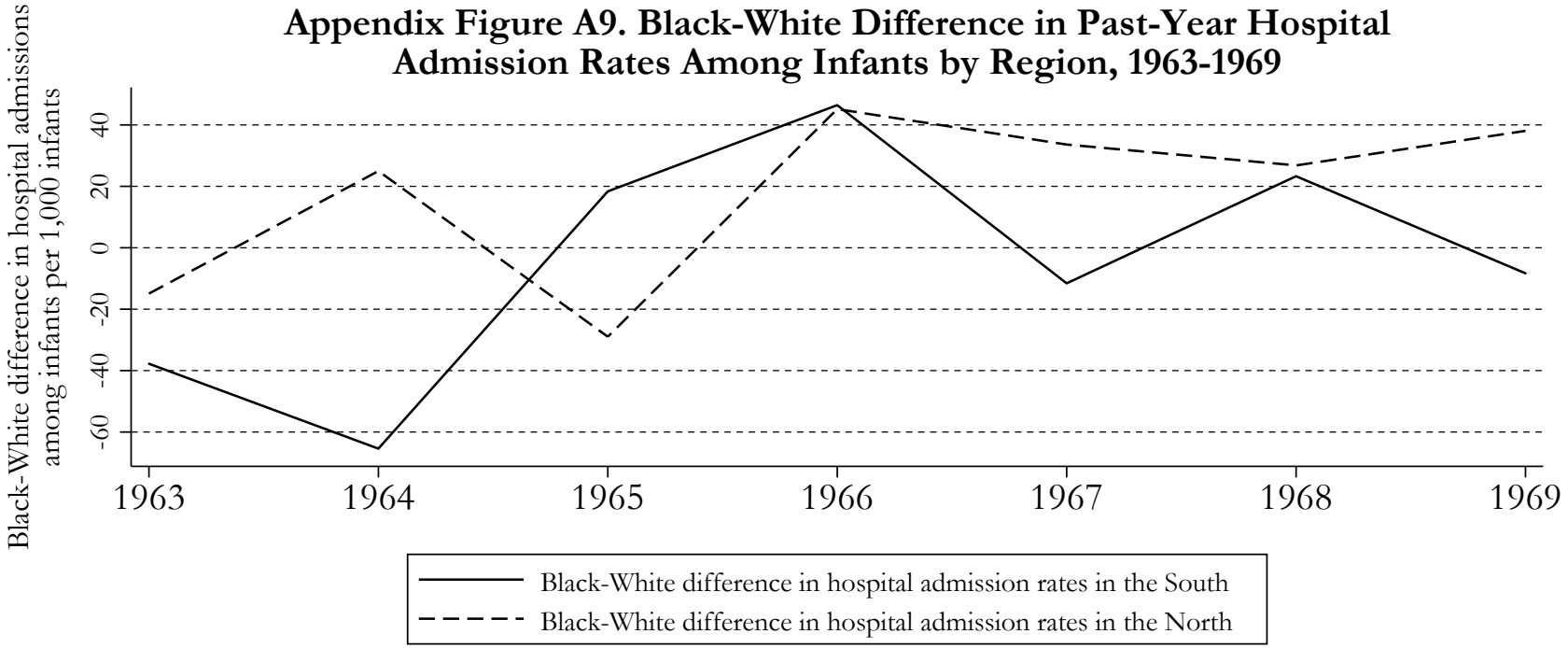
Notes: OLS coefficient estimates (and their 90% confidence intervals) are reported, where the omitted category is one year before treatment. The dependent variable is equal to the number of live in-hospital Black births per 1,000 live Black births in county *c* and year *t*. Controls include the county-level covariates listed in Appendix Table A2, county fixed effects, year fixed effects and county-specific linear trends. The regression is weighted by live Black births. Standard errors are corrected for clustering at the county level.

Appendix Figure A8. Pre- and Post-Treatment Trends in Out-of-Hospital Black Births by Midwives



Notes: OLS coefficient estimates (and their 90% confidence intervals) are reported, where the omitted category is one year before treatment. The dependent variable is equal to the number of live out-of-hospital Black births by midwives per 1,000 live Black births in county *c* and year *t*. Controls include the county-level covariates listed in Appendix Table A2, county fixed effects, year fixed effects and county-specific linear trends. The regression is weighted by live Black births. Standard errors are corrected for clustering at the county level.

Appendix Figure A9. Black-White Difference in Past-Year Hospital Admission Rates Among Infants by Region, 1963-1969



Notes: Based on annual data from the National Health Interview Survey. Southern states include those in the West South Central, East South Central, and South Atlantic census divisions. Northern states include those in the West North Central, East North Central, and Middle Atlantic census divisions.

Appendix Table A1. Number of Counties with Access to a Medicare-Certified Hospital by State and Year

State	1967	1968	1969	1970 or later
Alabama	51	56	56	58
Total counties = 58[a]	[.931]	[.990]	[.990]	[1.00]
Georgia	133	146	149	153
Total counties = 153[b]	[.911]	[.968]	[.986]	[1.00]
Louisiana	54	58	58	64
Total counties = 64	[.912]	[.956]	[.956]	[1.00]
Mississippi	57	74	77	82
Total counties = 82	[.635]	[.884]	[.953]	[1.00]
South Carolina	40	44	45	46
Total counties = 46	[.846]	[.952]	[.992]	[1.00]

[a] Nine Alabama counties are excluded from the analysis due to missing live Black birth data.

[b] Six Georgia counties are excluded from the analysis because no live Black births were recorded during the sample period.

Notes: Numbers in brackets represent the fraction of live Black births that occurred in counties with access to a Medicare-certified hospital.

Appendix Table A2. Descriptive Statistics

	Mean (SD)	Description	Source
Black Infant Mortality	42.2 (16.7)	Number of Black infant deaths per 1,000 live Black births in county *c* and year *t*	Multiple Cause-of-Death Mortality Files, published by the National Vital Statistics System. Available at: https://data.nber.org/data/vital-statistics-mortality-data-multiple-cause-of-death.html.
White Infant Mortality	21.9 (15.5)	Number of White infant deaths per 1,000 live White births in county *c* and year *t*	
High School Degree	35.2 (10.8)	Percent of county population that was 25 years of age or older with a high school diploma	County and City Data Book Consolidated File: County Data, 1947-1977 (ICPSR 7736). Available at: https://www.icpsr.umich.edu/web/ICPSR/studies/7736. Missing values were calculated via linear interpolation.
Health Spending	15.8 (16.8)	County direct health and hospital expenditures per capita (1960 dollars)	Data Base on Historical Finances of Local Governments: Fiscal Years 1957-2002. Available at: https://www.census.gov/programs-surveys/gov-finances/data/historical-data.html. Missing values were calculated via linear interpolation and extrapolation.
Employment to Population	.030 (.007)	County employment to population ratio	Data Base on Historical Employment of Local Governments: 1957-2007. Available at: https://www.census.gov/programs-surveys/gov-finances/data/historical-data.html. Missing values were calculated via linear interpolation and extrapolation.

Notes: Means are weighted by live births and standard deviations are in parentheses. N = 6,033.

Appendix Table A3. Proportion of Counties Treated Based on Alternative Thresholds

State	Proportion of counties treated by year (any-hospital threshold)				Proportion of counties treated by year (bed threshold = 25%)				Proportion of counties treated by year (bed threshold = 50%)				Proportion of counties treated by year (bed threshold = 75%)			
	1967	1968	1969	1970	1967	1968	1969	1970	1967	1968	1969	1970	1967	1968	1969	1970
Alabama	.879	.966	.966	.983	.862	.948	.966	.983	.845	.931	.948	.983	.810	.897	.914	.966
Georgia	.869	.954	.974	.980	.863	.954	.974	.980	.850	.948	.967	.974	.850	.948	.967	.974
Louisiana	.844	.906	.906	.938	.828	.906	.906	.938	.734	.875	.891	.906	.656	.813	.859	.875
Mississippi	.695	.902	.939	.976	.683	.890	.939	.976	.622	.841	.927	.963	.598	.756	.817	.890
South Carolina	.870	.957	.978	.978	.848	.935	.978	.978	.848	.935	.978	.978	.783	.891	.935	.935

Notes: Treatment thresholds based on percent of beds in Medicare-certified hospitals.

Appendix Table A4. The Effect of the Hospital Desegregation Campaign on Black Infant Mortality by State, 1959-1973

	(1)	(2)	(3)	(4)
	Panel I: Alabama			
Medicare	-8.92***	4.29	4.82	7.87*
	(.842)	(3.97)	(3.87)	(4.25)
Pre-treatment mean	44.1	44.1	44.1	44.1
N	869	869	869	869
R^2	.139	.174	.177	.269
	Panel II: Georgia			
Medicare	-11.7***	1.48	1.40	-4.30
	(.953)	(3.08)	(3.04)	(3.48)
Pre-treatment mean	44.5	44.5	44.5	44.5
N	2,284	2,284	2,284	2,284
R^2	.120	.173	.173	.253
	Panel III: Louisiana			
Medicare	-13.0***	4.69*	4.83	5.45
	(.666)	(2.75)	(2.94)	(3.29)
Pre-treatment mean	44.7	44.7	44.7	44.7
N	960	960	960	960
R^2	.268	.355	.361	.422
	Panel IV: Mississippi			
Medicare	-12.8***	3.80*	4.05**	3.53
	(1.18)	(1.98)	(1.96)	(2.47)
Pre-treatment mean	52.7	52.7	52.7	52.7
N	1,230	1,230	1,230	1,230
R^2	.171	.257	.258	.337
	Panel V: South Carolina			
Medicare	-23.0***	-5.85	-5.89	-2.64
	(2.68)	(4.04)	(4.17)	(3.76)
Pre-treatment mean	55.5	55.5	55.5	55.5
N	690	690	690	690
R^2	.363	.474	.492	.654
Year fixed effects	No	Yes	Yes	Yes
County-level covariates	No	No	Yes	Yes
County-specific linear trend	No	No	No	Yes

*Statistically significant at 10% level; ** at 5% level; *** at 1% level.

Notes: Based on annual data from the Multiple Cause-of-Death Mortality Files, published by the National Vital Statistics System. Each column within each panel represents results from a separate OLS regression. The dependent variable is equal to the number of Black infant deaths per 1,000 live Black births in county *c* and year *t*. All models control for county fixed effects. Regressions are weighted by live Black births. Standard errors, corrected for clustering at the county level, are in parentheses.

Appendix Table A5. Replicating and Extending Estimates from Almond et al. (2006) on the Effect of the Hospital Desegregation Campaign on Postneonatal Mortality in Mississippi by Race

	(1)	(2)	(3)	(4)	(5)	(6)
	Estimates reported in Almond et al. (2006)		Replicating and extending estimates reported in Almond et al. (2006)			
Panel I. Black postneonatal mortality						
1 Year After Medicare	-5.74***	-5.84***	-6.46***	-5.34***	-1.64	-2.64
	(1.36)	(1.46)	(1.20)	(1.16)	(1.46)	(2.08)
2 Years After Medicare	-8.00***	-8.09***	-8.15***	-6.64***	-1.62	-3.35
	(1.37)	(1.50)	(1.01)	(1.15)	(1.65)	(2.79)
3 Years After Medicare	-9.79***	-9.81***	-8.39***	-6.59***	-.751	-3.30
	(1.54)	(1.83)	(.899)	(1.32)	(1.84)	(3.79)
4 Years After Medicare	-10.2***	-10.3***	-10.6***	-9.05***	-1.84	-5.54
	(1.82)	(2.17)	(1.16)	(1.39)	(2.34)	(4.72)
5 Years After Medicare	-11.5***	-11.9***	-10.4***	-9.19***	-.258	-5.17
	(2.06)	(2.46)	(1.48)	(1.82)	(3.14)	(6.38)
6 Years After Medicare	-12.6***	-12.9***	-9.10***	-7.63***	1.67	-4.20
	(2.19)	(2.78)	(1.25)	(1.74)	(3.51)	(7.65)
N	1,022	1,022	1,200	1,200	1,200	1,200
R^2	.20	.42	.19	.41	.38	.43
Panel II. White postneonatal mortality						
1 Year After Medicare	.377	.600	-1.08**	-.472	1.01	-.093
	(.589)	(.660)	(.456)	(.631)	(.749)	(1.01)
2 Years After Medicare	-.660	-.302	-1.52***	-.762	1.41	-.393
	(.607)	(.691)	(.504)	(.681)	(.792)	(1.44)
3 Years After Medicare	-1.03	-.556	-2.27***	-1.42*	-.177	-2.90
	(.667)	(.749)	(.431)	(.755)	(.849)	(1.86)
4 Years After Medicare	-1.76**	-1.36	-2.23***	-1.49**	.588	-3.04
	(.716)	(.840)	(.449)	(.737)	(.947)	(2.36)
5 Years After Medicare	-1.52**	-1.21	-1.83***	-1.03	1.18	-3.66
	(.729)	(.840)	(.628)	(.902)	(1.28)	(2.86)
6 Years After Medicare	-1.35	-1.08	-1.16**	-.366	1.77	-4.71
	(.878)	(1.02)	(.561)	(.914)	(1.44)	(3.73)
N	1,022	1,022	1,200	1,200	1,200	1,200
R^2	.04	.24	.04	.23	.17	.24
County fixed effects	No	Yes	No	Yes	Yes	Yes
County-level covariates	No	Yes	No	Yes	Yes	Yes
County-specific linear trend	No	Yes	No	Yes	No	Yes
Year fixed effects	No	No	No	No	Yes	Yes

*Statistically significant at 10% level; ** at 5% level; *** at 1% level.

Notes: Each column within each panel represents results from a separate OLS regression. The dependent variable is equal to the number of postneonatal deaths per 1,000 race-specific live births in county *c* and year *t*. Medicare certification dates come from Almond et al. (2006). The models in columns (1) and (3) also include a pre-Medicare certification linear trend. In column (2), the county-level covariates used by Almond et al. (2006) include measures of maternal characteristics, per capita income and government transfer payments. The county-level covariates used in columns (4)-(6) are listed in Appendix Table A2. Almond et al. (2006) restricted their sample to no more than 7 years before and 6 years after Medicare certification. In columns (3)-(6), the sample is based on all county-year combinations for the period 1959-1973. Standard errors, corrected for clustering at the county level, are in parentheses.

Appendix Table A6. Replicating and Extending Estimates from Almond et al. (2006) on the Effect of the Hospital Desegregation Campaign on Postneonatal Mortality due to Pneumonia, Influenza, and Diarrhea in Mississippi by Race

	(1)	(2)	(3)	(4)	(5)	(6)
	Estimates reported in Almond et al. (2006)		Replicating and extending estimates reported in Almond et al. (2006)			
Panel I. Black postneonatal mortality due to pneumonia, influenza, and diarrhea						
1 Year After Medicare	-2.91***	-2.60***	-4.14***	-3.98***	-.992	-1.76
	(.984)	(.962)	(.618)	(.620)	(.789)	(1.00)
2 Years After Medicare	-4.75***	-4.40***	-4.06***	-3.45***	-.011	-1.28
	(1.00)	(1.05)	(.661)	(.906)	(1.00)	(1.37)
3 Years After Medicare	-4.21***	-3.91***	-4.79***	-4.07***	.261	-1.57
	(1.17)	(1.31)	(.571)	(.912)	(1.06)	(2.05)
4 Years After Medicare	-4.99***	-4.64***	-5.70***	-5.37***	-.480	-3.16
	(1.44)	(1.58)	(.786)	(1.02)	(1.48)	(2.89)
5 Years After Medicare	-5.36***	-4.96***	-5.47***	-5.15***	.285	-2.89
	(1.59)	(1.61)	(.936)	(1.26)	(2.05)	(3.84)
6 Years After Medicare	-5.78***	-5.20***	-5.57***	-5.10***	.898	-3.04
	(1.83)	(1.96)	(.745)	(1.33)	(2.24)	(4.62)
N	1,022	1,022	1,200	1,200	1,200	1,200
R^2	.16	.43	.14	.41	.38	.44
Panel II. White postneonatal mortality due to pneumonia, influenza, and diarrhea						
1 Year After Medicare	.341	.331	-.312	.185	.415	-.086
	(.242)	(.262)	(.250)	(.292)	(.361)	(.420)
2 Years After Medicare	.409	.395	-.475**	.076	.168	-.653
	(.287)	(.333)	(.194)	(.242)	(.531)	(.556)
3 Years After Medicare	.222	.225	-.749***	-.145	-.225	-1.46**
	(.259)	(.300)	(.201)	(.314)	(.618)	(.726)
4 Years After Medicare	.170	.131	-.936***	-.389	.091	-1.62*
	(.327)	(.370)	(.176)	(.292)	(.612)	(.861)
5 Years After Medicare	.074	.001	-.988***	-.402	.371	-1.81
	(.293)	(.331)	(.218)	(.316)	(.692)	(1.10)
6 Years After Medicare	.067	-.033	-.555*	.074	.321	-2.60*
	(.355)	(.411)	(.285)	(.476)	(.799)	(1.56)
N	1,022	1,022	1,200	1,200	1,200	1,200
R^2	.03	.25	.02	.20	.15	.21
County fixed effects	No	Yes	No	Yes	Yes	Yes
County-level covariates	No	Yes	No	Yes	Yes	Yes
County-specific linear trend	No	Yes	No	Yes	No	Yes
Year fixed effects	No	No	No	No	Yes	Yes

*Statistically significant at 10% level; ** at 5% level; *** at 1% level.

Notes: Each column within each panel represents results from a separate OLS regression. The dependent variable is equal to the number of postneonatal deaths due to pneumonia, influenza, and diarrhea per 1,000 race-specific live births in county *c* and year *t*. Medicare certification dates come from Almond et al. (2006). The models in columns (1) and (3) also include a pre-Medicare certification linear trend. In column (2), the county-level covariates used by Almond et al. (2006) include measures of maternal characteristics, per capita income and government transfer payments. The county-level covariates used in columns (4)-(6) are listed in Appendix Table A2. Almond et al. (2006) restricted their sample to no more than 7 years before and 6 years after Medicare certification. In columns (3)-(6), the sample is based on all county-year combinations for the period 1959-1973. Standard errors, corrected for clustering at the county level, are in parentheses.

Appendix Table A7. Using and Extending Almond et al.'s (2006) Specification to Estimate the Effect of the Hospital Desegregation Campaign on Black Postneonatal Mortality in the Five Deep South States

	(1)	(2)	(3)	(4)
Panel I. Black postneonatal mortality				
1 Year After Medicare	-4.83***	-2.12***	1.02	1.10
	(.543)	(.548)	(.991)	(1.16)
2 Years After Medicare	-6.90***	-3.71***	.068	.237
	(.551)	(.546)	(1.33)	(1.66)
3 Years After Medicare	-8.07***	-4.33***	-.148	.266
	(.579)	(.679)	(1.59)	(2.17)
4 Years After Medicare	-9.73***	-5.59***	-.944	-.322
	(.613)	(.778)	(1.81)	(2.44)
5 Years After Medicare	-10.2***	-5.59***	.551	1.29
	(.619)	(.920)	(2.26)	(3.17)
6 Years After Medicare	-9.86***	-4.57***	2.77	3.94
	(.637)	(1.00)	(2.76)	(3.97)
N	6,033	6,033	6,033	6,033
R^2	.14	.50	.43	.51
Panel II. Black postneonatal mortality due to pneumonia, influenza, and diarrhea				
1 Year After Medicare	-2.19***	-.584	1.68**	2.23***
	(.399)	(.483)	(.727)	(.807)
2 Years After Medicare	-3.42***	-1.51***	1.54	2.50**
	(.442)	(.536)	(.995)	(1.14)
3 Years After Medicare	-4.52***	-2.27***	1.56	3.14**
	(.426)	(.562)	(1.13)	(1.50)
4 Years After Medicare	-5.52***	-3.04***	1.31	3.51*
	(.501)	(.667)	(1.43)	(1.97)
5 Years After Medicare	-5.78***	-3.08***	2.25	5.21**
	(.471)	(.689)	(1.79)	(2.46)
6 Years After Medicare	-6.47**	-3.30***	3.08	7.30**
	(.475)	(.727)	(2.04)	(2.95)
N	6,033	6,033	6,033	6,033
R^2	.09	.48	.40	.48
County fixed effects	No	Yes	Yes	Yes
County-level covariates	No	Yes	Yes	Yes
County-specific linear trend	No	Yes	No	Yes
Year fixed effects	No	No	Yes	Yes

*Statistically significant at 10% level; ** at 5% level; *** at 1% level.

Notes: Each column within each panel represents results from a separate OLS regression. The dependent variable is equal to the number of postneonatal deaths per 1,000 race-specific live births in county *c* and year *t*. The model in column (1) also includes a pre-Medicare certification linear trend. Standard errors, corrected for clustering at the county level, are in parentheses.

Appendix Table A8. The Hospital Desegregation Campaign and Black Hospitals, 1959-1973

	(1)	(2)	(3)	(4)
	In-Hospital Black Births	*Out-of-Hospital Black Births by Physicians*	*Out-of-Hospital Black Births by Midwives*	*Black Infant Mortality*
Medicare	32.1***	.920	-33.0***	1.28
	(10.9)	(3.09)	(12.0)	(1.50)
*Medicare*Black Hospital*	-.623	-2.28	2.89	.378
	(11.2)	(3.28)	(10.8)	(1.34)
Pre-treatment mean	727.2	37.1	235.7	47.8
N	5,164	5,164	5,164	6,033
R^2	.838	.572	.823	.368

*Statistically significant at 10% level; ** at 5% level; *** at 1% level.

Notes: The results in columns (1)-(3) are based on annual data from individual state vital statistics reports and the Natality Files, published by the National Vital Statistics System. The results in column (4) are based on annual data from the Multiple Cause-of-Death Mortality Files, published by the National Vital Statistics System. Each column represents results from a separate OLS regression. In columns (1)-(3), the dependent variable is equal to the number of live Black births by location and attendant per 1,000 live Black births in county *c* and year *t*. In column (4), the dependent variable is equal to the number of Black infant deaths per 1,000 live Black births in county *c* and year *t*. All models control for the county-level covariates listed in Appendix Table A2, county fixed effects, year fixed effects and county-specific linear trends. Regressions are weighted by live Black births. Standard errors, corrected for clustering at the county level, are in parentheses.

Appendix B

For Online Publication

Appendix Table B1. Assigned Medicare Certification Dates

State	County	Year of Medicare certification (any hospital certified)	Year of Medicare certification (25% of beds covered)	Year of Medicare certification (50% of beds covered)	Year of Medicare certification (75% of beds covered)
Alabama	Autauga	1967	1967	1967	1967
Alabama	Baldwin	1967	1967	1967	1967
Alabama	Barbour	1967	1967	1967	1967
Alabama	Bibb	1967	1967	1967	1967
Alabama	Blount[a]	1967	1967	1967	1968
Alabama	Bullock	1968	1968	1968	1968
Alabama	Butler	1967	1967	1967	1967
Alabama	Calhoun	1967	1967	1967	1967
Alabama	Chambers	1967	1967	1967	1967
Alabama	Cherokee	1967	1967	1967	1967
Alabama	Chilton	1967	1967	1967	1967
Alabama	Choctaw	1968	1968	1968	1968
Alabama	Clarke	1967	1967	1967	1971
Alabama	Clay	1967	1967	1967	1967
Alabama	Cleburne[a]	1967	1967	1967	1967
Alabama	Coffee	1967	1967	1967	1967
Alabama	Colbert	1967	1967	1967	1967
Alabama	Conecuh	1967	1967	1967	1967
Alabama	Coosa	1967	1967	1967	1967
Alabama	Covington	1967	1967	1967	1967
Alabama	Crenshaw	1967	1967	1967	1967
Alabama	Cullman[a]	1967	1967	1967	1967
Alabama	Dale	1967	1967	1967	1967
Alabama	Dallas	1967	1969	1969	1969
Alabama	DeKalb[a]	1967	1967	1967	1967
Alabama	Elmore	1967	1967	1967	1967
Alabama	Escambia	1967	1967	1967	1967
Alabama	Etowah	1967	1967	1967	1967
Alabama	Fayette	1967	1967	1967	1967
Alabama	Franklin[a]	1967	1967	1967	1967
Alabama	Geneva	1967	1967	1967	1967
Alabama	Greene	1967	1967	1967	1967
Alabama	Hale	1967	1967	1967	1967
Alabama	Henry	1967	1967	1967	1967
Alabama	Houston	1967	1967	1967	1967
Alabama	Jackson[a]	1967	1967	1967	1967
Alabama	Jefferson	1967	1967	1967	1967
Alabama	Lamar	1967	1967	1967	1967
Alabama	Lauderdale	1967	1967	1967	1967
Alabama	Lawrence	1967	1967	1967	1967
Alabama	Lee	1967	1967	1967	1967
Alabama	Limestone	1967	1967	1967	1967
Alabama	Lowndes	1967	1967	1967	1967
Alabama	Macon	1967	1967	1967	1967
Alabama	Madison	1967	1967	1967	1970

Alabama	Marengo	1968	1968	1968	1968
Alabama	Marion[a]	1967	1967	1967	1967
Alabama	Marshall[a]	1967	1967	1967	1967
Alabama	Mobile	1967	1967	1968	1968
Alabama	Monroe	1968	1968	1968	1968
Alabama	Montgomery	1967	1967	1967	1967
Alabama	Morgan	1967	1967	1967	1967
Alabama	Perry	1967	1967	1967	1967
Alabama	Pickens	1967	1967	1967	1967
Alabama	Pike	1968	1968	1970	1970
Alabama	Randolph	1967	1967	1967	1967
Alabama	Russell	1967	1967	1967	1967
Alabama	St. Clair	1970	1970	1970	1970
Alabama	Shelby	1967	1967	1967	1967
Alabama	Sumter	1967	1967	1967	1967
Alabama	Talladega	1967	1967	1967	1967
Alabama	Tallapoosa	1967	1967	1967	1967
Alabama	Tuscaloosa	1967	1967	1967	1967
Alabama	Walker	1967	1967	1967	1967
Alabama	Washington	1971	1971	1971	1971
Alabama	Wilcox	1967	1967	1967	1967
Alabama	Winston[a]	1967	1967	1967	1967
Georgia	Appling	1967	1967	1967	1967
Georgia	Atkinson	1967	1967	1967	1967
Georgia	Bacon	1967	1967	1967	1967
Georgia	Baker	1967	1967	1967	1967
Georgia	Baldwin	1969	1969	1969	1969
Georgia	Banks	1967	1967	1967	1967
Georgia	Barrow	1967	1967	1967	1967
Georgia	Bartow	1967	1967	1967	1967
Georgia	Ben Hill	1967	1967	1967	1967
Georgia	Berrien	1967	1967	1967	1967
Georgia	Bibb	1967	1967	1967	1967
Georgia	Bleckley	1967	1967	1967	1967
Georgia	Brantley	1967	1967	1967	1967
Georgia	Brooks	1967	1967	1967	1967
Georgia	Bryan	1967	1967	1967	1967
Georgia	Bulloch	1967	1967	1967	1967
Georgia	Burke	1967	1967	1967	1967
Georgia	Butts	1967	1967	1967	1967
Georgia	Calhoun	1967	1967	1967	1967
Georgia	Camden	1969	1969	1969	1969
Georgia	Candler	1967	1967	1967	1967
Georgia	Carroll	1967	1967	1967	1967
Georgia	Catoosa	1968	1968	1968	1968
Georgia	Charlton	…	…	…	…
Georgia	Chatham	1967	1967	1967	1967
Georgia	Chattahoochee	1967	1967	1967	1967
Georgia	Chattooga	1967	1967	1967	1967
Georgia	Cherokee	1967	1967	1967	1967
Georgia	Clarke	1967	1967	1967	1967

Georgia	Clay	1967	1967	1967	1967
Georgia	Clayton	1967	1967	1967	1967
Georgia	Clinch	1967	1967	1967	1967
Georgia	Cobb	1967	1967	1967	1967
Georgia	Coffee	1967	1967	1967	1967
Georgia	Colquitt	1967	1967	1967	1967
Georgia	Columbia	1967	1967	1967	1967
Georgia	Cook	1967	1967	1967	1967
Georgia	Coweta	1967	1967	…	…
Georgia	Crawford	1967	1967	1967	1967
Georgia	Crisp	1967	1967	1967	1967
Georgia	Dade	1967	1967	1967	1967
Georgia	Dawson[b]	1967	1967	1967	1967
Georgia	Decatur	1967	1967	1968	1968
Georgia	DeKalb	1967	1967	1967	1967
Georgia	Dodge	1967	1967	1967	1967
Georgia	Dooly	1967	1967	1967	1967
Georgia	Dougherty	1967	1967	1967	1967
Georgia	Douglas	1967	1967	1967	1967
Georgia	Early	1967	1967	1967	1967
Georgia	Echols	1967	1967	1967	1967
Georgia	Effingham	1967	1967	1967	1967
Georgia	Elbert	1967	1967	1967	1967
Georgia	Emanuel	1967	1967	1967	1967
Georgia	Evans	1967	1967	1967	1967
Georgia	Fannin[b]	1967	1967	1967	1967
Georgia	Fayette	1967	1967	1967	1967
Georgia	Floyd	1967	1967	1967	1967
Georgia	Forsyth[b]	1967	1967	1967	1967
Georgia	Franklin	1967	1967	1967	1967
Georgia	Fulton	1967	1967	1967	1967
Georgia	Gilmer[b]	1967	1967	1967	1967
Georgia	Glascock	1967	1967	1967	1967
Georgia	Glynn	1967	1967	1967	1967
Georgia	Gordon	1967	1967	1967	1967
Georgia	Grady	1968	1968	1968	1968
Georgia	Greene	1967	1967	1967	1967
Georgia	Gwinnett	1967	1967	1967	1967
Georgia	Habersham	1967	1967	1967	1967
Georgia	Hall	1967	1967	1967	1967
Georgia	Hancock	1967	1967	1967	1967
Georgia	Haralson	1967	1967	1967	1967
Georgia	Harris	1967	1967	1967	1967
Georgia	Hart	1967	1967	1967	1967
Georgia	Heard	1967	1967	1967	1967
Georgia	Henry	1967	1967	1967	1967
Georgia	Houston	1967	1967	1967	1967
Georgia	Irwin	1967	1967	1967	1967
Georgia	Jackson	1967	1967	1967	1967
Georgia	Jasper	1968	1968	1968	1968
Georgia	Jeff Davis	1967	1967	1967	1967
Georgia	Jefferson	1967	1967	1967	1967

Georgia	Jenkins	1968	1968	1968	1968
Georgia	Johnson	1967	1967	1967	1967
Georgia	Jones	1967	1967	1967	1967
Georgia	Lamar	1967	1967	1967	1967
Georgia	Lanier	1967	1967	1967	1967
Georgia	Laurens	1968	1968	1968	1968
Georgia	Lee	1967	1967	1967	1967
Georgia	Liberty	1967	1967	1967	1967
Georgia	Lincoln	1967	1967	1967	1967
Georgia	Long	1967	1967	1967	1967
Georgia	Lowndes	1967	1968	1968	1968
Georgia	Lumpkin	1967	1967	1967	1967
Georgia	McDuffie	1967	1967	1967	1967
Georgia	McIntosh	1967	1967	1967	1967
Georgia	Macon	…	…	…	…
Georgia	Madison	1967	1967	1967	1967
Georgia	Marion	1967	1967	1967	1967
Georgia	Meriwether	1967	1967	1967	1967
Georgia	Miller	1967	1967	1967	1967
Georgia	Mitchell	1967	1967	1967	1967
Georgia	Monroe	1967	1967	1967	1967
Georgia	Montgomery	1967	1967	1967	1967
Georgia	Morgan	1967	1967	1967	1967
Georgia	Murray	1967	1967	1967	1967
Georgia	Muscogee	1967	1967	1967	1967
Georgia	Newton	1967	1967	1967	1967
Georgia	Oconee	1967	1967	1967	1967
Georgia	Oglethorpe	1967	1967	1967	1967
Georgia	Paulding	1967	1967	1967	1967
Georgia	Peach	1967	1967	1967	1967
Georgia	Pickens	1967	1967	1967	1967
Georgia	Pierce	1967	1967	1967	1967
Georgia	Pike	1967	1967	1967	1967
Georgia	Polk	1967	1967	1967	1967
Georgia	Pulaski	1968	1968	1968	1968
Georgia	Putnam	1967	1967	1967	1967
Georgia	Quitman	1967	1967	1967	1967
Georgia	Rabun	1967	1967	1967	1967
Georgia	Randolph	1967	1967	1967	1967
Georgia	Richmond	1967	1967	1967	1967
Georgia	Rockdale	1967	1967	1967	1967
Georgia	Schley	1967	1967	1967	1967
Georgia	Screven	1969	1969	1969	1969
Georgia	Seminole	1967	1967	1967	1967
Georgia	Spalding	1967	1967	1967	1967
Georgia	Stephens	1967	1967	1967	1967
Georgia	Stewart	1968	1968	1968	1968
Georgia	Sumter	1967	1967	1967	1967
Georgia	Talbot	1967	1967	1967	1967
Georgia	Taliaferro	1967	1967	1967	1967
Georgia	Tattnall	1968	1968	1968	1968
Georgia	Taylor	…	…	…	…

Georgia	Telfair	1967	1967	1967	1967
Georgia	Terrell	1968	1968	1968	1968
Georgia	Thomas	1967	1967	1967	1967
Georgia	Tift	1967	1967	1967	1967
Georgia	Toombs	1968	1968	1968	1968
Georgia	Towns[b]	1967	1967	1967	1967
Georgia	Treutlen	1970	1970	1970	1970
Georgia	Troup	1967	1967	1967	1967
Georgia	Turner	1967	1967	1967	1967
Georgia	Twiggs	1967	1967	1967	1967
Georgia	Union[b]	1967	1967	1967	1967
Georgia	Upson	1967	1967	1967	1967
Georgia	Walker	1968	1968	1968	1968
Georgia	Walton	1967	1967	1967	1967
Georgia	Ware	1967	1967	1967	1967
Georgia	Warren	1967	1967	1967	1967
Georgia	Washington	1967	1967	1967	1967
Georgia	Wayne	1968	1968	1968	1968
Georgia	Webster	1967	1967	1967	1967
Georgia	Wheeler	1967	1967	1967	1967
Georgia	White	1967	1967	1967	1967
Georgia	Whitfield	1967	1967	1967	1967
Georgia	Wilcox	1967	1967	1967	1967
Georgia	Wilkes	1967	1967	1967	1967
Georgia	Wilkinson	1967	1967	1967	1967
Georgia	Worth	1968	1968	1968	1968
Louisiana	Acadia	1967	1967	1967	1967
Louisiana	Allen	1967	1967	1967	1967
Louisiana	Ascension	1967	1967	1967	1968
Louisiana	Assumption	1972	1972	1972	1972
Louisiana	Avoyelles	1967	1967	1968	1968
Louisiana	Beauregard	1967	1967	1967	1967
Louisiana	Bienville	1967	1967	1967	1967
Louisiana	Bossier	1968	1968	1968	1968
Louisiana	Caddo	1967	1968	1968	1968
Louisiana	Calcasieu	1967	1967	1967	1967
Louisiana	Caldwell	1967	1967	1967	1967
Louisiana	Cameron	1967	1967	1967	1967
Louisiana	Catahoula	1967	1967	1967	1967
Louisiana	Claiborne	1967	1967	1968	1968
Louisiana	Concordia	1967	1967	1967	1967
Louisiana	De Soto	1968	1968	1968	1968
Louisiana	East Baton	1967	1967	1967	1967
Louisiana	East Carroll	1967	1967	1967	1967
Louisiana	East Feliciana	1967	1967	1967	1967
Louisiana	Evangeline	1967	1967	1967	1967
Louisiana	Franklin	1967	1967	1967	1967
Louisiana	Grant	1967	1967	1967	1967
Louisiana	Iberia	1967	1967	1967	1967
Louisiana	Iberville	1970	1970	1970	1970
Louisiana	Jackson	1967	1967	1967	1969

Louisiana	Jefferson	1967	1967	1967	1967
Louisiana	Jefferson Davis	1967	1967	1967	1967
Louisiana	Lafayette	1967	1967	1967	1967
Louisiana	Lafourche	1967	1967	1967	1967
Louisiana	La Salle	1967	1967	1967	…
Louisiana	Lincoln	1967	1967	1967	1967
Louisiana	Livingston	1967	1967	1967	1967
Louisiana	Madison	1967	1967	1967	1967
Louisiana	Morehouse	1968	1968	1968	1968
Louisiana	Natchitoches	1967	1967	1967	1967
Louisiana	Orleans	1967	1967	1967	1968
Louisiana	Ouachita	1967	1967	1969	1969
Louisiana	Plaquemines	1973	1973	1973	…
Louisiana	Pointe Coupee	1967	1967	1967	1967
Louisiana	Rapides	1967	1967	1967	1967
Louisiana	Red River	1970	1970	…	…
Louisiana	Richland	1971	1971	1973	1973
Louisiana	Sabine	1967	1967	1967	1967
Louisiana	St. Bernard	1971	1971	1971	1971
Louisiana	St. Charles	1967	1967	1967	1967
Louisiana	St. Helena	1967	1967	1967	1967
Louisiana	St. James	1967	1967	1967	1967
Louisiana	St. John the Baptist	1967	1967	1967	1967
Louisiana	St. Landry	1967	1967	1967	1967
Louisiana	St. Martin	1967	1967	1967	1967
Louisiana	St. Mary	1967	1967	1967	1967
Louisiana	St. Tammany	1967	1967	1967	1967
Louisiana	Tangipahoa	1967	1967	1967	1967
Louisiana	Tensas	1968	1968	1968	1968
Louisiana	Terrebonne	1967	1967	1967	1967
Louisiana	Union	1967	1967	1967	1967
Louisiana	Vermilion	1967	1967	1967	1967
Louisiana	Vernon	1967	1967	1973	…
Louisiana	Washington	1967	1967	1968	1968
Louisiana	Webster	1967	1967	1968	1973
Louisiana	West Baton Rouge	1967	1967	1967	1967
Louisiana	West Carroll	1967	1967	1967	1967
Louisiana	West Feliciana	1967	1967	1967	1967
Louisiana	Winn	1967	1967	1967	1969
Mississippi	Adams	1968	1968	1968	1968
Mississippi	Alcorn	1967	1967	1967	1967
Mississippi	Amite	1967	1967	1967	1967
Mississippi	Attala	1967	1967	1967	1967
Mississippi	Benton	1967	1967	1967	1967
Mississippi	Bolivar	1967	1967	1969	1969
Mississippi	Calhoun	1973	1973	1973	1973
Mississippi	Carroll	1967	1967	1967	1967
Mississippi	Chickasaw	1967	1967	1967	1967
Mississippi	Choctaw	1967	1967	1967	1967
Mississippi	Claiborne	1968	1968	1968	1968
Mississippi	Clarke	1968	1968	1968	1968

Mississippi	Clay	1968	1968	1968	1968
Mississippi	Coahoma	1967	1967	1967	1967
Mississippi	Copiah	1967	1967	1967	1967
Mississippi	Covington	1970	1970	1970	1970
Mississippi	DeSoto	1967	1967	1967	1967
Mississippi	Forrest	1968	1968	1969	1969
Mississippi	Franklin	1967	1967	1967	1967
Mississippi	George	1967	1967	1967	1967
Mississippi	Greene	1967	1967	1967	1967
Mississippi	Grenada	1967	1967	1967	1967
Mississippi	Hancock	1967	1967	1967	1967
Mississippi	Harrison	1967	1967	1967	1967
Mississippi	Hinds	1967	1967	1968	1970
Mississippi	Holmes	1968	1968	1968	1972
Mississippi	Humphreys	1969	1969	1969	1969
Mississippi	Issaquena	1967	1967	1967	1967
Mississippi	Itawamba	1967	1967	1967	1967
Mississippi	Jackson	1967	1967	1967	1967
Mississippi	Jasper	1967	1967	1967	1967
Mississippi	Jefferson	1967	1967	1967	1967
Mississippi	Jefferson Davis	1967	1967	1967	1967
Mississippi	Jones	1967	1967	1967	1970
Mississippi	Kemper	1967	1967	1967	1967
Mississippi	Lafayette	1967	1967	1967	1967
Mississippi	Lamar	1967	1967	1967	1967
Mississippi	Lauderdale	1967	1967	1968	1970
Mississippi	Lawrence	1968	1968	1968	1968
Mississippi	Leake	1967	1967	1967	1967
Mississippi	Lee	1967	1967	1967	1967
Mississippi	Leflore	1969	1969	1969	1969
Mississippi	Lincoln	1967	1967	1967	1967
Mississippi	Lowndes	1969	1969	1969	1973
Mississippi	Madison	1967	1967	1967	1967
Mississippi	Marion	1968	1968	1968	1968
Mississippi	Marshall	1967	1967	1967	1967
Mississippi	Monroe	1967	1967	1967	1967
Mississippi	Montgomery	1968	1968	1968	1968
Mississippi	Neshoba	1967	1967	1967	1967
Mississippi	Newton	1967	1967	1968	1968
Mississippi	Noxubee	1970	1970	1970	1970
Mississippi	Oktibbeha	1967	1967	1967	1967
Mississippi	Panola	1968	1968	1968	1968
Mississippi	Pearl River	1967	1967	1973	1973
Mississippi	Perry	1967	1967	1967	1967
Mississippi	Pike	1967	1969	1969	…
Mississippi	Pontotoc	1967	1967	1967	1967
Mississippi	Prentiss	1967	1967	1967	1967
Mississippi	Quitman	1967	1967	1967	1967
Mississippi	Rankin	1968	1968	1968	1968
Mississippi	Scott	1967	1967	1967	1967
Mississippi	Sharkey	1968	1968	1968	1968
Mississippi	Simpson	1968	1968	1968	1974

Mississippi	Smith	1967	1967	1967	1967
Mississippi	Stone	1967	1967	1967	1967
Mississippi	Sunflower	1968	1968	1969	1969
Mississippi	Tallahatchie	1967	1967	1967	1967
Mississippi	Tate	1967	1967	1967	1967
Mississippi	Tippah	1967	1967	1967	1967
Mississippi	Tishomingo	1967	1967	1967	1967
Mississippi	Tunica	1968	1968	1968	1968
Mississippi	Union	1967	1967	1967	1967
Mississippi	Walthall	1970	1970	1970	1970
Mississippi	Warren	1967	1967	1967	1972
Mississippi	Washington	1968	1968	1968	1973
Mississippi	Wayne	1967	1967	1967	1967
Mississippi	Webster	1967	1967	1967	1967
Mississippi	Wilkinson	1968	1968	1968	1968
Mississippi	Winston	1967	1967	1967	1967
Mississippi	Yalobusha	1967	1967	1967	1967
Mississippi	Yazoo	1973	1973	1973	1973
South Carolina	Abbeville	1967	1967	1967	1967
South Carolina	Aiken	1967	1967	1967	1967
South Carolina	Allendale	1967	1967	1967	1967
South Carolina	Anderson	1967	1967	1967	1967
South Carolina	Bamberg	1967	1967	1967	1967
South Carolina	Barnwell	1967	1967	1967	1967
South Carolina	Beaufort	1968	1968	1968	1968
South Carolina	Berkeley	1967	1967	1967	1967
South Carolina	Calhoun	1967	1967	1967	1968
South Carolina	Charleston	1967	1967	1967	…
South Carolina	Cherokee	1967	1967	1967	1967
South Carolina	Chester	1967	1967	1967	1967
South Carolina	Chesterfield	1967	1967	1967	1967
South Carolina	Clarendon	1968	1968	1968	1968
South Carolina	Colleton	1967	1967	1967	1967
South Carolina	Darlington	1967	1967	1967	1967
South Carolina	Dillon	1967	1967	1967	1967
South Carolina	Dorchester	1967	1967	1967	1967
South Carolina	Edgefield	1967	1967	1967	1967
South Carolina	Fairfield	1967	1967	1967	1967
South Carolina	Florence	1967	1967	1967	1967
South Carolina	Georgetown	1967	1967	1967	1967
South Carolina	Greenville	1967	1967	1967	1967
South Carolina	Greenwood	1967	1969	1969	1969
South Carolina	Hampton	1968	1968	1968	1968
South Carolina	Horry	1967	1967	1967	1967
South Carolina	Jasper	1973	1973	1973	1973
South Carolina	Kershaw	1967	1967	1967	1967
South Carolina	Lancaster	1967	1967	1967	1967
South Carolina	Laurens	1967	1967	1967	1967
South Carolina	Lee	1967	1967	1967	1967
South Carolina	Lexington	1967	1967	1967	1967
South Carolina	McCormick	1967	1967	1967	1967

South Carolina	Marion	1967	1967	1967	1967
South Carolina	Marlboro	1967	1967	1967	1967
South Carolina	Newberry	1967	1967	1967	1967
South Carolina	Oconee	1967	1967	1967	1967
South Carolina	Orangeburg	1968	1968	1968	1968
South Carolina	Pickens	1967	1967	1967	1967
South Carolina	Richland	1967	1967	1967	1971
South Carolina	Saluda	1967	1967	1967	1967
South Carolina	Spartanburg	1967	1967	1967	1967
South Carolina	Sumter	1969	1969	1969	1969
South Carolina	Union	1967	1967	1967	1967
South Carolina	Williamsburg	1967	1967	1967	1967
South Carolina	York	1967	1967	1967	1967

[a] Excluded from the analysis due to missing live Black birth data. Nine Alabama counties are excluded for this reason.
[b] Excluded from the analysis because no live Black births were recorded for the sample period. Six Georgia counties are excluded for this reason.

Notes: Medicare certification dates come from the "Guide Issues" of the *Journal of the American Hospital Association*, published annually by the American Hospital Association. Each issue lists whether a hospital was "certified for participation in the Health Insurance for the Aged (Medicare) Program by the Department of Health, Education, and Welfare" by a specific date. Information on Medicare certification is considered complete as of the following dates:

1967 Guide Issue: Listing is complete as of February, 1967
1968 Guide Issue: Listing is complete as of February, 1968
1969 Guide Issue: Listing is complete as of October, 1968
1970 Guide Issue: Listing is complete as of October, 1969
1971 Guide Issue: Listing is complete as of October, 1970
1972 Guide Issue: Listing is complete as of November, 1971
1973 Guide Issue: Listing is complete as of November, 1972
1974 Guide Issue: Listing is complete as of November, 1973

Appendix Table B2. Data Sources for County-Level Live Births by Race and Attendant

State	Sources	Notes
Alabama	1959-1967: Yearly volumes of *Vital Statistics of the United States*, made available through the NBER with support from NIA grant P30-AG012810. Available at: https://data.nber.org/births/1940-1968/. 1968-1973: Compiled by the authors using the National Center for Health Statistics' birth certificate data, made available through the NBER at: https://data.nber.org/data/vital-statistics-natality-data.html.	Information on county-level births by race is not available from Alabama vital statistics, which only report state-level aggregates. Information on county-level births by race is unavailable from the *Vital Statistics of the United States* for the years 1959-1967 for 9 counties. These counties are excluded from all analyses. Information on county-level births by out-of-hospital attendant (i.e., physician vs. midwife) is unavailable from the *Vital Statistics of the United States* for the years 1960-1967 for all counties. Consequently, Alabama is excluded from the birth location/attendant analysis in Section 4.
Georgia	1959-1961: Yearly volumes of *Vital Statistics, Georgia*, made available through inter-library loan with Cornell University. 1962-1963: Yearly volumes of *Georgia Vital and Morbidity Statistics*, made available through inter-library loan with Georgia College and State University. 1964: *Georgia Vital and Morbidity Statistics*, made available through inter-library loan with Cornell University. 1965-1970: Yearly volumes of *Georgia Vital and Morbidity Statistics*, made available through inter-library loan with Georgia College and State University. 1971: *Georgia Vital and Morbidity Statistics*, made available through inter-library loan with Georgia Southern University. 1972-1973: Compiled by the authors using the National Center for Health Statistics' birth certificate data. Available at: https://data.nber.org/data/vital-statistics-natality-data.html.	Information on county-level births by out-of-hospital attendant (i.e., physician vs. midwife) is unavailable from the Georgia vital statistics for the years 1972-1973. We used the natality data made available through the NBER to compute county-level births by out-of-hospital attendant for these years. For the period 1959-1973, there are 101 county-year observations in Georgia where there were no Black births. These observations are excluded from all analyses.

Louisiana	1959-1966: Yearly volumes of *Statistical Report of the Division of Public Health Statistics*, made available through correspondence with the Vital Records Central Office, Louisiana Department of Health. 1967-1972: Yearly volumes of *Statistical Report of the Bureau of Vital Statistics*, made available through correspondence with the Vital Records Central Office, Louisiana Department of Health. 1973: *Vital Statistics of Louisiana*, made available through correspondence with the Vital Records Central Office, Louisiana Department of Health.
Mississippi	1959-1961: Yearly volumes of *Public Health Statistics State of Mississippi*, made available through correspondence with the Office of Public Health Statistics, Mississippi State Department of Health. 1962-1973: Yearly volumes of *Vital Statistics Mississippi*, made available through correspondence with the Office of Public Health Statistics, Mississippi State Department of Health.
South Carolina	1959-1973: Yearly volumes of *Annual Report of the State Board of Health of South Carolina*, made available through inter-library loan with South Carolina State University.

Appendix Table B3. International Classification of Disease (ICD) Codes Used to Generate Infant Mortality Rates by Cause of Death

Cause of death	ICD codes, 7th revision, 1959-1967	ICD codes, 8th revision, 1968-1973
Pneumonia	Lobar pneumonia (490) Bronchopneumonia (491) Primary atypical pneumonia (492) Pneumonia, other and unspecified (493) Pneumonia of newborns (763)	Viral pneumonia (480) Pneumococcal pneumonia (481) Other bacterial pneumonia (482) Pneumonia due to other specified organism (483) Acute interstitial pneumonia (484) Bronchopneumonia, unspecified (485) Pneumonia, unspecified (486)
Influenza	Influenza with pneumonia (480) Influenza with other respiratory manifestations, and influenza unqualified (481) Influenza with digestive manifestations, but without respiratory symptoms (482) Influenza with nervous manifestations, but without digestive or respiratory symptoms (483)	Influenza unqualified (470) Influenza with pneumonia (471) Influenza with other respiratory manifestations (472) Influenza with digestive manifestations (473) Influenza with nervous manifestations (474)
Diarrhea (including dysentery)	Bacillary dysentery (045) Amoebiasis (046) Other protozoal dysentery (047) Unspecified form of dysentery (048) Gastritis and duodenitis (543) Gastro-enteritis and colitis, except ulcerative, age 4 weeks and older (571) Chronic enteritis and ulcerative colitis (572) Diarrhea of newborns (764)	Bacillary dysentery (004) Amoebiasis (006) Enteritis due to other specified organism (008) Diarrhoeal disease (009) Gastritis and duodenitis (535) Gastro-enteritis and colitis, except ulcerative, of noninfectious origin (561) Chronic enteritis and ulcerative colitis (563)

Notes: Three-digit ICD codes are in parentheses.