Anti-Black Hate Crimes & Health Outcomes of Black Americans

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Abstract

In 2019, hate crimes reported in the United States rose to the highest level in a decade. High exposure to race-motivated violence may induce psychological stress among Black individuals, contributing to racial disparities in health. In this paper, I conduct two separate yet complementary studies that document the adverse effects of anti-Black hate crimes on the health outcomes of Black infants and adults. First, I leverage a rich data set consisting of all nationwide birth records from the National Center for Health Statistics to show that in utero exposure to local anti-Black aggravated assaults is associated with lower birth weights and shorter gestation lengths among Black infants. These effects are substantial. For Black infants, exposure to eleven or more anti-Black aggravated assaults during gestation is linked to an over 70 gram decrease in birth weight. Second, using restricted-access Emergency Department Data from the California Department of Health Care Access and Information, I find a nearly 50% increase, relative to the mean, in the volume of chest pain-related Emergency Department visits among Black adults following an anti-Black aggravated assault in their area of residence. In contrast to these results, I report that the effects on White infants and adults are negligible in magnitude and largely insignificant. Taken together, this suggests that stress associated with exposure to local anti-Black hate crimes may be a contributor to the racial health disparities present in the United States.

Keywords: hate crimes, racism, health disparities

JEL codes: I14, I18, K42

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1 Introduction

Disparities in health outcomes between Black and White Americans begin at birth and persist throughout the life course. Black infants are over twice as likely as White infants to die before their first birthday (Office of Minority Health, 2023a), and Black adults are 30% more likely to die from heart disease relative to their White peers (Office of Minority Health, 2023b). While earlier research often attributed these disparities to differences in socio-economic conditions, a substantial body of work points instead to the psychological stress experienced by minority individuals upon encountering discrimination (Geronimus, 1992; Lauderdale, 2006; Gemmill et al., 2019; Samari et al., 2020; Goin et al., 2021; Curtis et al., 2021; Vu et al., 2023). To this end, as of September 2023, 21 states have declared racism as a public health crisis, acknowledging that racism constitutes a major barrier to achieving health equity (American Public Health Association, 2023).

Hate crimes, i.e., crimes motivated by a bias against a specific social group, are an increasingly common manifestation of racism. There were over 7,000 hate crimes reported in the United States in 2019, the highest level in a decade, and anti-Black bias motivated a quarter of these incidents (see: Figure 1). In fact, in 2019, two out of three Black Americans resided in a county that reported at least one anti-Black hate crime, making exposure to nearby racially motivated violence a common experience for Black Americans. Moreover, as hate crimes by definition target entire communities (not individuals), hate crimes carry a strong potential to induce psychological stress even among the non directly victimized members of the targeted groups (Martell, 2023).

This paper is the first one to study the impact of local anti-Black hate crimes on the health outcomes of Black Americans. I focus specifically on the impact of anti-Black aggravated

assaults.[1] Aggravated assaults are the largest violent offense category among hate crimes,[2] and violent crimes are more likely to attract attention of news media (Marsh, 1991; O'Hear, 2020), allowing for information dissemination among the non directly victimized individuals.

I provide evidence from two separate but complementary studies (see: Table 1). In the first study, I use the restricted-access natality data from the National Center for Health Statistics to examine the impact of in utero exposure to local anti-Black aggravated assaults on birth outcomes. In the second study, I use the restricted-access Emergency Department Data from the California Department of Health Care Access and Information to study how the volume of chest pain-related Emergency Department (ED) visits changes following a local anti-Black aggravated assault.

The juxtaposition of the two studies enables me to make a major contribution to the literature. Previously studied in utero shocks have been criticized for being "quirky" and "exotic", and their generalizability to other settings has been questioned (Almond et al., 2018). I overcome this concern by showing that anti-Black violence adversely affects Black infants as well as adults and that it has both long-run and short-run effects on health outcomes.

In the first study, I compare birth outcomes of mothers who reside in counties reporting at least one anti-Black aggravated assault during pregnancy or after delivery. Mothers exposed to a stressor soon after delivery are thought to be the best control group for mothers exposed to the same stressor during pregnancy (Persson and Rossin-Slater, 2018; Currie et al., 2022). Among Black infants, in utero anti-Black aggravated assaults are associated with decreases in birth weight and gestational length as well as increases in the incidence of low birth weight and preterm delivery. These effects are substantial in magnitude. Exposure to 11 or more

[1] An aggravated assault is an "unlawful attack by one person upon another for the purpose of inflicting severe or aggravated bodily injury" (Federal Bureau of Investigation, 2017).

[2] Violent crimes include murder and nonnegligent manslaughter, forcible rape, robbery, and aggravated assault (Federal Bureau of Investigation, 2010).

anti-Black aggravated assaults in utero is linked to an over 70 gram decrease in birth weight for Black infants.

In the second study, I report a significant increase in the number of chest pain-related Emergency Department visits among Black patients on the day of an anti-Black aggravated assault within the patients' ZIP code of residence (over 40% increase, relative to the mean). The effects are very immediate, which is consistent with existing literature on acute stress exposures and cardiovascular morbidity. At the same time, I provide descriptive evidence suggesting that the effects are delayed in areas with limited access to local news media, which indicates that information dissemination through the news media may be a mediating factor.

The effects of anti-Black aggravated assaults on health outcomes of White infants and adults are to a large extent not significant and smaller in magnitude than the effects among Black infants and adults. White individuals are less likely than Black individuals to identify with the victims of anti-Black hate crimes, and individuals not identifying with the victims are less affected by a crime than individuals strongly identifying with the victims (Powdthavee, 2005). These differences in reported effects suggest that anti-Black violence may be a contributor to the Black-White disparities in health outcomes.

I conduct a series of placebo tests to show that anti-Black aggravated assaults occurring after birth do not affect birth outcomes and that anti-Black aggravated assaults occurring after the visit day do not affect the number of chest pain-related ED visits. In addition, I show that anti-White aggravated assaults as well as non-hate-motivated aggravated assaults do not affect birth outcomes of either Black or White mothers. I also demonstrate that anti-White aggravated assaults do not affect the number of chest pain-related Emergency Department visits among Black or White patients. This suggests a unique quality to anti-Black violence that sets it apart from non-hate-motivated violence and hate crimes against majority groups.

The paper's sections are organized as follows: Section (II) briefly summarizes the literature on stress, birth outcomes, and cardiovascular health, Section (III) describes the data used, Section (IV) reviews the empirical strategy, Section (V) discusses the results, and Section (VI) concludes.

2 Background & Literature

In Utero Stress & Birth Outcomes. Prematurity is a leading cause of infant mortality (March of Dimes, 2023). However, health at birth is also associated with a range of health and economic outcomes later in life. Children delivered prematurely or born small are more likely to have worse adult health, lower educational attainment, and lower earnings (Black et al., 2005; Royer, 2009; Almond and Currie, 2011; Almond et al., 2018).

Worse health at birth is strongly linked to maternal exposure to stress during pregnancy (Aizer et al., 2012). Past research documents that earthquakes, bombings, rocket attacks, terrorist attacks, armed conflict, homicides, mass shootings, intimate partner violence, and family bereavement during pregnancy all carry the potential to increase the rate of preterm deliveries and low birth weights (Camacho, 2008; Torche, 2011; Mansour and Rees, 2012; Quintana-Domeque and Rodenas-Serrano, 2017; Brown, 2018; Persson and Rossin-Slater, 2018; Dursun, 2019; Lichtman-Sadot et al., 2022; Currie et al., 2022). However, even exposure to rather mild and less obvious in utero stressors, such as Super Bowl-related emotional arousal, can have a negative effect on birth outcomes (Duncan et al., 2016).

There are three primary pathways through which in utero stress can lead to pre-term birth and low birth weight: hormonal, immune, and behavioral (Schetter, 2009). Corticotrophin-releasing hormone (CRH) is typically secreted by the pituitary gland in response to stress. During pregnancy, CRH is also released through the placenta and plays a critical role in coordinating maternal and fetal endorine events. Increases in CRH too early during the

pregnancy (already during weeks 16 through 20) are associated with higher rates of pre-term deliviers, a phenomenon referred to as "placental clock" (McLean et al., 1995; Herrera et al., 2021). Stress is also known to supress body's natural immune responses, increasing susceptibility to infections. Mothers with urinary tract infections or with infections of more remote sites, such as gingivitis, tend to experience higher rates of pre-term deliveries and low birth weights (Webb et al., 2014). In fact, maternal infection is a leading cause of spontaneous pre-term births before the 32nd week of gestation (University of Utah Health, 2023). Finally, stress can alter behaviors around sleep, nutrition, substance use, physical activity, and healthcare utilization, all of which can affect fetal health (Stults-Kolehmainen and Sinha, 2013; Kim et al., 2018).

Stress & Cardiovascular Health. Psychological stress is associated with elevated likelihood of cardiovascular morbidity in the long run but stress can cause worse cardiovascular outcomes also in the very short term. Earthquakes, terrorist attacks, and even soccer games were found to be related with increases in deaths due to adverse cardiac events on the day of initial exposure and during the days that followed (Trichopoulos et al., 1983; Meisel et al., 1991; Steinberg et al., 2004; Wilbert-Lampen et al., 2008). The onset of symptoms tends to occur very rapidly, with victims developing chest pain as early as within the first hour of exposure (Leor et al., 1996).

Stress activates the sympathetic nervous system and raises the blood levels of hormones such as epinephrine and cortisol, increasing heart rate and blood pressure. In addition, stress can induce a narrowing of blood vessels in the heart. Coronary vasoconstriction, in combination with heightened heart rate and blood pressure, leads to insufficient amount of oxygen-rich blood being supplied to the heart, causing chest pain and, in extreme cases, myocardial infraction, colloquially referred to as a heart attack (Levine, 2022)

3 Data

3.1 Hate Crime Data

Data on anti-Black hate crimes are extracted from the Federal Bureau of Investigation (FBI)'s Uniform Crime Reporting (UCR) Program. The FBI began collecting information on hate crimes in the United States in 1991, pursuant to the Hate Crime Statistics Act (Office of the Law Revision Counsel, 2021). Local agencies voluntarily submit reports of hate crime using a two-step procedure. At the first step, if the officer directly responding to a crime suspects a bias motivation, they forward the case details to a special unit at their local agency. At the second step, the special unit reviews the case file and, if the bias motivation is confirmed, submits incident information to the UCR Program (Federal Bureau of Investigation, 2022). The FBI compiles the reports submitted by local agencies and each year releases a consolidated report on hate crimes in the Unites States. For every incident, the data provides the Originating Agency Identification (ORI) code, the incident date and type (e.g., aggravated assault), as well as the bias category (e.g., anti-race) and subcategory (e.g., anti-Black). I focus on anti-Black aggravated assaults, which I define as any hate crime with a bias motivation which includes anti-Black or anti-African American and offense type which includes aggravated assault.

There are several challenges associated with using the hate crime data. First, as participation in the UCR Program is voluntary, local police agencies may choose not to contribute data to the Program (Kaplan, 2023). Figure 2 plots the geographic distribution of hate crimes reported in the United States from 1991 through 2019. While information on hate crimes is not available for approximately a quarter of all counties, these counties are to large extent rural and account for only 4% of the total population.[3] I exclude from my analyses all counties for which information on hate crimes is not available.

[3] Author's calculations.

Second, local police agencies may modify their reporting behavior over time due to factors such as changes in the broad socio-political climate. In the first study, I address this challenge by limiting the sample to mothers residing in counties which report an anti-Black aggravated assault either during pregnancy or up to 10 months after delivery. It is less likely that reporting behavior will undergo substantial changes over relatively short periods of time. In the second study, I leverage data from California which is a state with one of the highest shares of reporting agencies (Kaplan, 2023), pointing to a culture which promotes hate crime reporting among victims and local agencies. However, analogously to the first study, I also restrict the sample to patients residing in ZIP codes which report a hate crime either up to three days before the visit day or up to three days after the visit day. Finally, in both studies, I show that my results are robust to excluding the counties and ZIP codes most likely to change their reporting behavior over time (i.e., those reporting only one hate crime throughout the sample period).

Third, individuals may choose not to report hate crime victimization to local police agencies and, even if they do, police officers may not classify the reported crime as a hate crime. However, this worry is likely to be more relevant in the case of non-violent offenses, such as intimidation and vandalism. In the case of violent offenses, such as aggravated assault, individuals may be more inclined to report victimization and police offers involved in responding to the report may have more incentive to thoroughly examine potential bias motivation.

Panel A of Table 2 provides the summary statistics for hate crimes reported nationwide from 1991 through 2019. An average county reported nearly 86 hate crimes in total, out of which 29 hate crimes were motivated by an anti-Black bias and nearly four constituted anti-Black aggravated assaults.

3.2 Natality Data

Data on birth outcomes come from restricted access county-level natality files, which are provided by the National Center for Health Statistics (National Center for Health Statistics, 2021) and compiled using the information from birth certificates. The data span the universe of known births in the United States and include information on pregnancy characteristics (e.g., gestation length), mother's demographics (e.g., race, age), and infant outcomes (e.g., birth weight). Using standard classifications set by the World Health Organization, I construct four main birth outcome variables: *Birth weight*, *Low birth weight*, *Gestation length*, and *Pre-term delivery*. *Birth weight* reflects an infant's weight at birth expressed in grams; *Low Birth Weight* is an indicator variable that takes the value of one when an infant's birth weight is less than 2,500 grams (World Health Organization, 2014); *Gestation length* reflects the gestation length expressed in weeks; *Pre-term delivery* is an indicator variable that takes the value of one when the gestation length is less than 37 weeks (World Health Organization, 2018).

I concentrate on non-Hispanic Black and non-Hispanic White mothers between the ages of 15 and 49. I limit the baseline sample to singleton births as twin growth patterns differ from singleton growth patterns, and multiple pregnancies constitute only 3% of all live births (Centers for Disease Control and Prevention, 2023). I focus on viable and peri-viable births, i.e., births with gestation length longer than 22 weeks. Panel B of Table 2 summarizes the demographic characteristics as well as birth outcomes of Black and White mothers in the sample. Black mothers are younger, less likely to be married, and less likely to have a college degree than White mothers. Black mothers are also around twice as likely as White mothers to give birth preterm and to have infants with low birth weight.

3.3 Emergency Department (ED) Data

I obtained the restricted-access data on Emergency Department visits from the California Department of Health Care Access and Information (HCAI) (California Department of Health Care Access and Information, 2022). The data span the universe of face-to-face Emergency Department encounters in California from 2011 through 2019 and include information on the date of the visit, patient's demographic characteristics (race, gender, age category), patient's ZIP code of residence, and the International Classification of Diseases (ICD) codes for every diagnosis made during the visit.

I concentrate on non-Hispanic Black and non-Hispanic White patients residing in California. Panel C of Table 2 summarizes the demographic characteristics for the patients in the sample. Both Black and White patients are balanced in terms of gender; however, Black patients tend to be younger than White patients. In an average ZIP code, Black patients make approximately 4.504 visits to the Emergency Department per day, including 0.263 chest pain-related visits, whereas White patients make about 12.720 visits to the Emergency Department per day, including 0.700 chest pain-related visits.

The sample covered by the ED data is a product of two types of selection processes. Individuals need to experience symptoms severe enough that make them seek a face-to-face encounter with a provider within the context of an Emergency Department. At the same time, the symptoms cannot be severe enough to warrant hospital admission as the ED data does not include information on visits that result in same-hospital admission. Given this, I focus on ED visits related to chest pain. Chest pain is one of the primary symptoms of a myocardial infraction (National Center for Chronic Disease Prevention and Health Promotion, 2022), making patients more likely to seek immediate medical help upon experiencing chest pain. This is potentially not the case for other stress-related conditions, such as panic attacks, for which seeking care may be perceived as elective. Indeed, chest pain is the second most common reason for ED visits, after abdominal pain (Rui et al., 2013). At the same

time, majority of patients presenting with chest pain in the Emergency Department are discharged without a cardiac diagnosis (Cleveland Clinic, 2022) and only 14% are admitted to a hospital (Natsui et al., 2021).

Chest pain-related ICD codes used to construct the main outcome variable are listed in Table A1. I classify a visit as chest pain-related if chest pain is listed as either the principal diagnosis or other diagnosis. HCAI transitioned from using ICD-9 to using ICD-10 in 2015 but the day-of-year fixed effects included in the baseline model account for any differences in reporting chest pain due to the ICD-9 to IDC-10 transition.

3.4 Subsidiary Data

In addition to the three main data sources, several subsidiary data sources are also utilized. First, the Law Enforcement Agency Identifiers Crosswalk (Bureau of Justice Statistics, 2021) is leveraged to harmonize geographic identifiers across the hate crime statistics, the natality files, and the ED data. Second, the United States Census data (United States Census, 2022) is used to construct county-level and ZIP-code level population variables. Third, the Uniform Crime Reporting (UCR) Program Data: Supplemental Homicide Reports (Kaplan, 2021) and Offenses Known and Clearances by Arrest (Kaplan, 2020) are used to obtain county-level crime levels.[4] Fourth, the Bureau of Labor Statistics data are used to extract county-level unemployment rates (U.S. Bureau of Labor Statistics, 2021).

[4]This data is supplemented with the Florida Supplemental Homicide Reports (Florida Department of Law Enforcement, 2021) to correct the temporal aggregation of crime reports in Florida for several years in the original data.

4 Methods

4.1 Anti-Black Aggravated Assaults & Birth Outcomes

So as to isolate the effect of exposure to anti-Black aggravated assaults on infant health, I begin by restricting the sample to mothers residing in counties that report an anti-Black aggravated assault during pregnancy or up to ten months after birth. Mothers exposed to a stressor after delivery are the most suitable controls for mothers exposed to the same stressor during pregnancy (Persson and Rossin-Slater, 2018; Currie et al., 2022). My sample is therefore defined by the following set:

$$S = \{i : \mathbf{1}[e_c \leqslant Assault \leqslant e_b]_i = 1 \vee \mathbf{1}[e_b < Assault \leqslant e_b + 10]_i = 1\} \tag{1}$$

In equation (1), e_c denotes the expected month and year of conception (i.e., the month and year obtained by subtracting gestation length from the actual birth month and year) and e_b denotes the expected month and year of birth (i.e, the month and year obtained by adding nine months to the expected month and year of conception).[5] The final sample $i \in \{S\}$ includes all mothers residing in counties that report at least one anti-Black aggravated assault during or after the expected month and year of conception but before or during the expected month and year of birth. The sample also includes all mothers residing in the counties that report at least one anti-Black aggravated assault up to ten months after the expected month and year of birth (see Figure 3 for a graphical explanation of this sample design). The sample is defined in terms of expected, as opposed to actual, month and year of conception and birth as the actual month and year of birth can be endogenous to anti-Black hate crimes (i.e, the shorter the length of gestation, the smaller the likelihood of exposure to treatment (Currie et al., 2022)).

[5] As the restricted access natality files do not include the exact date of birth, all births are assumed to occur on the 15th day of the month.

Using the sample $i \in \{S\}$, I estimate the following model:

$$Y_{cmy} = \alpha + \beta Assault_{cmy} + \gamma X_{cmy} + \delta_c + \theta_{my} + \epsilon_{cmy} \tag{2}$$

where Y_{cmy} denotes a birth outcome of mothers residing in county c, with children conceived in month m and year y, and $Assault_{cmy}$ represents the number of anti-Black aggravated assaults in county c during pregnancy that started in month m and year y. The set of covariates, X_{cmy}, includes controls for maternal and county characteristics likely affecting birth outcomes: the proportion of mothers in given age (<20, 20-24, 25-34, >34 years old) and education categories (less than high school degree, high school degree, some college degree, college degree or more), the proportion of births in given birth order categories, the proportion of male infants, the proportion of mothers married, total and Black population, unemployment rate, and the homicide rate in county c. The model is weighted using the number of births conceived in county c, in month m and year y.

County and month-by-year fixed effects are denoted by, respectively, δ_c and θ_{my}; ϵ_{cmy} is the error term, and the standard errors are clustered at the county level. Month-by-year fixed effects account for the factors that affect all infants conceived in the same month and year, such as nation-wide shifts in unemployment or inflation. County fixed effects account for the factors that affect all infants of mothers residing in the same county and that remain stable over time, such as county area.

Anti-Black aggravated assaults are parameterized as the raw count of anti-Black aggravated assault reports at a county-by-month level. Literature on in utero exposure to crime uses different parameterizations depending on the relative frequency of the crime being studied. Mass shootings have been parameterized as binary variables (Dursun, 2019), instances of fatal police violence have been parameterized as raw counts (Jahn et al., 2021), and homicides have been parameterized in terms of rates per thousand residents (Torche and Villarreal,

2014). While the raw count is my preferred parameterization for anti-Black aggravated assaults as anti-Black aggravated assaults occur more frequently than mass shootings but less frequently than homicides, the effects are robust to these alternative parameterizations.

The main coefficient of interest is β. It captures the effect of exposure to an additional anti-Black aggravated assault in utero as compared to the exposure after birth. However, it is worth noting that β does not capture the stress associated with living in a county experiencing significant anti-Black sentiment. As an anti-Black aggravated assault may be perceived as an extreme manifestation of anti-Black sentiment, the estimates reported in this work capture the effect of exposure to an acute manifestation of anti-Black sentiment.

The effects for Black and White mothers are reported separately throughout the paper. White individuals are, by definition, not the targets of anti-Black violence. Given that individuals are more likely to be affected by the news of crime if they identify with the victim (Powdthavee, 2005), I hypothesize that the relationship between anti-Black aggravated assaults will be substantially weaker for White mothers than for Black mothers.

The identification strategy outlined above relies on an assumption that the timing of exposure to an anti-Black aggravated assault is exogenous to other factors that could also affect mother's birth outcomes. In Table 7, I provide evidence of the plausibility of this assumption by demonstrating that exposure to anti-Black aggravated assaults during pregnancy does not predict mother's demographic characteristics. Table 7 also shows that in utero exposure to anti-Black aggravated assaults has no effect on the number of births in a county. Thus, there seems to be no evidence of compositional effects impacting the reported results.

To further verify the validity of the empirical strategy, I check whether anti-Black aggravated assaults *after* expected delivery affect mothers' birth outcomes. Intuitively, anti-Black aggravated assaults after expected delivery constitute a placebo treatment and should not affect birth outcomes, given that birth has already occurred. Figures 11 and 12 document

the effects of anti-Black aggravated assaults during pregnancy as well as 1-10 months and 11-20 months after delivery on birth outcomes. Anti-Black aggravated assaults *after* delivery do not appear to affect birth outcomes of either Black or White mothers.

4.2 Anti-Black Aggravated Assaults & Emergency Department (ED) Visits

The strategy used to capture the effect of anti-Black aggravated assaults on birth outcomes is not perfectly suited for capturing the effect on chest pain-related Emergency Department visits. This is because equation (2) is designed to model the intergenerational effects of anti-Black aggravated assaults at a county level rather than the very immediate effects in the days that follow an anti-Black aggravated assault within a ZIP code.

Consider the sample of patients residing in ZIP codes that report a hate crime shortly before or shorty after a chest pain-related Emergency Department visit:

$$S' = \{i : \mathbf{1}[v-3 \leqslant HateCrime \leqslant v]_i = 1 \vee \mathbf{1}[v < HateCrime \leqslant v+3]_i = 1\} \tag{3}$$

where $v-3$ indicates the third day before the visit day, v indicates the visit day, and $v+3$ indicates the third day after the visit day. $\mathbf{1}[v-3 \leqslant HateCrime \leqslant v]_i = 1$ denotes the patients residing in ZIP codes that report a hate crime up to three days before the visit and $\mathbf{1}[v < HateCrime \leqslant v+3]_i = 1$ denotes the patients residing in ZIP codes that report a hate crime up to three days after the visit (see Figure 4 for a graphical explanation of this sample design).

Using the sample $i \in \{S'\}$, I estimate the following model:

$$Y_{tz} = \alpha + \sum_{i=-3}^{0} \beta_{t_i} Assault_{t_i z} + \gamma X_{tz} + \delta_z + \theta_t + \epsilon_{tz} \tag{4}$$

where Y_{tz} denotes the number of chest pain-related ED visits on day t in ZIP code z, and $AB_{t_i z}$ (for $i = -3, -2, -1, 0$) is a binary variable equal to one when at least one anti-Black aggravated assault is reported in ZIP code z either three, two, or one day before the visit day t or on the visit day t. The set of covariates, X_{tz}, includes available patient-level characteristics likely associated with chest pain-related ED visits: the proportion of female patients and proportion of patients over 55 years of age, as well as the total number of ED visits on day t in ZIP code z. The set of covariates, X_{tz}, also includes the total population and Black population in ZIP code z.

ZIP code and day-of-year fixed effects are denoted by, respectively, δ_z and θ_t; ϵ_{zt} is the error term. I cluster the standard errors at the ZIP code level. Day-of-year fixed effects account for the factors that affect all patients visiting the Emergency Department on the same day, such as holiday effects or weather conditions. ZIP code fixed effects account for the factors which affect all patients residing in the same ZIP code but which remain stable over time, such distance to the nearest hospital.

The main coefficients of interest are β_0, β_{-1}, β_{-2}, and β_{-3} which correspond to the effects on the number of chest pain visits on the day of the assault, one day after the assault, two days after assault, and three days after the assault. Anti-Black aggravated assaults are parameterized as binary indicators given that, at a ZIP code-by-day level, they occur relatively infrequently. I focus on the effects up to three days after the assault as the lifespan of news stories related to violence and war tends to be limited to first three days following the triggering event (The Lifespan of News Stories, 2019), suggesting that individuals should be able to learn about the assault during this time frame.

The identification strategy outlined above relies on the assumption that the timing of

exposure to an anti-Black aggravated assault is exogenous to other factors that could affect the number of chest pain-related Emergency Department visits. To verify the validity of this empirical strategy, I conduct a placebo test showing that anti-Black aggravated assaults reported *after* the visit day do not affect the number of chest pain-related visits (see: Figure 15). This provides evidence indicating that trends in unobservable factors potentially impacting both anti-Black aggravated assaults and the number of chest pain ED visits do not seem to be driving the reported effects.

Analysis at a ZIP code-by-day level, although allowing for a identification of very local effects, posits important challenges. Importantly, daily crime data are not easily available at such a granular level. Therefore, it needs to be acknowledged that the changes in underlying crime levels can be a potential confounder.

5 Results

5.1 Anti-Black Aggravated Assaults & Birth Outcomes

Table 3 provides the effects of anti-Black aggravated assaults throughout pregnancy on birth outcomes of Black mothers (Panel A) and White mothers (Panel B), derived using equation (2). Recall that equation (2) is estimated using the sample of mothers residing in counties which report at least one anti-Black aggravated assault during pregnancy as well as mothers residing in counties which report at least one anti-Black aggravated assault up to 10 months after expected delivery. In column 1, the outcome variable is average birth weight in grams; in column 2, the outcome variable is average gestation length in weeks; in column 3, the outcome variable is fraction of births with low birth weight; in column 4, the outcome variable is proportion of births delivered preterm.

Across all outcome variables, the exposure to anti-Black aggravated assaults during pregnancy is associated with worse infant health among Black mothers but not among White

mothers. Among Black mothers, an additional anti-Black aggravated assault during pregnancy is associated with a reduction in birth weight by 1.280 grams and an increase in low birth weights by 0.5% relative to the mean. An extra anti-Black aggravated assault during pregnancy is also associated with a 0.005 week shorter gestation length and a 0.5% increase in pre-term deliveries, relative to the mean.

The magnitude of the effects among White mothers is substantially smaller than the magnitude of effects among Black mothers; the effects are also to a large extent insignificant. As hypothesized, White individuals seem less affected by anti-Black aggravated assaults than Black individuals, and the effects of anti-Black aggravated assaults are thus mostly diluted. Interestingly, in column 3 of Table 3, an additional anti-Black aggravated assault is actually associated with a slight decline in low birth weights among White mothers. In utero exposure to stress can occasionally improve birth outcomes through the channel of increased utilization of prenatal care (Torche and Villarreal, 2014; Lichtman-Sadot et al., 2022). Table 4 shows how exposure to in utero anti-Black aggravated assaults affects prenatal care utilization among Black and White mothers. Among White (but not Black mothers), an additional anti-Black aggravated assault during the first trimester is associated with an increase in the number of prenatal visits. At the same time, among Black mothers, an additional anti-Black aggravated assault during the first trimester of pregnancy is linked with lower rates of starting prenatal care in the first trimester. This suggests that Black mothers may choose to delay the onset of prenatal care in response to a local anti-Black aggravated assault early during the pregnancy.

The effects of exposure to anti-Black aggravated assaults during pregnancy on infant health are non-linear. Figures 5 and 6 show the effects of in utero exposure anti-Black aggravated assaults, for Black and White mothers respectively, when assaults are binned into the following categories: one or two, three or four, five or six, seven or eight, nine or ten, and eleven, twelve, or thirteen. Among Black mothers, the magnitude of effects increases

with the severity of exposure, and exposure to eleven or more in utero anti-Black aggravated assaults is linked to an over 70 gram decrease in birth weight. This is a substantial effect, especially in the context of effect sizes previously reported in the literature on in utero shocks (Brown, 2018; Vu, 2021). Effects on White mothers are largely insignificant, even when higher exposures are considered.

Past scholarship on in utero stressors points out that the timing of exposure during pregnancy matters. Notably, Dursun (2019) reports the strongest effects for exposure to a mass shooting in the second trimester of pregnancy, which is consistent with the phenomenon of a *placental clock*, through which exposure to stress early during the pregnancy can "program" the fetus for pre-term delivery (McLean et al., 1995; Herrera et al., 2021). My findings echo this very closely. Table 5 shows the effects of anti-Black aggravated assaults reported during the first, second, and third trimester of pregnancy. Similar to Dursun (2019), I find that, among Black mothers, the effects on birth outcomes are largely concentrated in the first and second trimesters.

Figures 7 and 8 contrast the effects of exposure to anti-Black aggravated assaults to the effects of exposure to other crimes: anti-White aggravated assaults (i.e., aggravated assaults motivated by an anti-White bias), all hate motivated aggravated assaults (i.e., aggravated assaults regardless of bias motivation), all anti-Black hate crimes (i.e., anti-Black hate crimes regardless of offense type), and non-hate motivated aggravated assaults (i.e., aggravated assaults not classified as hate motivated). The effects among Black mothers are insignificant except for exposures to anti-Black aggravated assaults, suggesting that exposures to *hate-motivated* crimes targeting one's *in-group* are the most salient to individuals. Simultaneously, the finding at all anti-Black hate crimes (regardless of offense type) are not significantly related to the birth outcomes of Black mothers also indicates that hate crimes at large, in contrast to the more violent hate crimes, may not receive the media attention required to affect broader communities. As before, the effects among White mothers are largely

insignificant throughout, even in the case of exposures to anti-White aggravated assaults.

The main results persist across several robustness checks. Figures 9 and 10 show the effects on birth outcomes of Black and White mothers when the baseline specification and sample are modified. First, I include state-by-year fixed effects alongside the county and month-by-year fixed effects to account for state-specific factors that change over time and that could affect birth outcomes. Second, I exclude all controls for maternal demographics and county-level characteristics. Third, I exclude all counties reporting only one hate crime throughout the sample period and therefore likely changing their reporting behavior over time. Among both Black and White mothers, the estimates remain stable in magnitude across all these specifications. The reported effects are also robust to changing the parameterization of the assault variable from raw counts to a natural logarithm, binary indicator, and a rate per 10,000 residents (see: Table 6).

Lastly, I conduct a placebo test to provide evidence that the trends in unobservable variables do not seem to be driving the reported results on birth outcomes. I check whether anti-Black aggravated assaults *before* the expected conception month and year and *after* the expected delivery month and year affect mothers' birth outcomes. Intuitively, anti-Black aggravated assaults following the expected delivery month and year should not affect birth outcomes. While anti-Black aggravated assaults before the expected conception month and year may have an effect on birth outcomes, this effect would likely be smaller in magnitude that the effects of exposures during pregnancy. Figures 11 and 12 document the placebo test estimating the effects of anti-Black aggravated assaults 1-10 months before conception, during pregnancy, 1-10 months after delivery, and 11-20 months after delivery. Anti-Black aggravated assaults *before* conception and *after* delivery do not appear to affect birth outcomes of either Black or White mothers.

5.2 Anti-Black Aggravated Assaults & Emergency Department (ED) Visits

Building on the intergenerational effects on birth outcomes, let us now move on to the more immediate results on chest pain-related Emergency Department visits. Table 8 shows the effects of anti-Black aggravated assaults in the patients' ZIP code of residence on the number chest pain-related Emergency Department visits on the day of the assault as well as one, two, and three days after the assault, estimated using equation (4). The model is reported separately for Black patients (Column 1) and White patients (Column 2). I find evidence of substantial immediate effects of anti-Black aggravated assaults among Black patients. In Column A, an anti-Black aggravated assault in the patient's ZIP code of residence is associated with 0.114 more chest-pain related ED visits on the day of the assault (a 43% change relative to the mean).

The immediacy of reported effects is consistent with existing literature on short-term effects of exposures to acute stressors, such as earthquakes (Leor et al., 1996). As the volume of chest pain-related ED visits does not seem to significantly change already one day after an anti-Black aggravated assault in the patient's ZIP code of residence, the effects of anti-Black aggravated assaults appear to quickly dissipate over time. Similarly to the effects on infant health, I report no significant relationship between exposures to anti-Black aggravated assaults and the outcomes of White patients.

One may wonder whether exposure to a local anti-White aggravated assault has any immediate effects on the outcomes of White adults. Figure 13 contrasts the estimated effects of exposure to anti-White aggravated assaults with the estimated effects of exposure to anti-Black aggravated assaults in the patient's ZIP code of residence on the day of the assault as well as one, two, and three days after the assault. As before, the results for Black and White patients are reported separately. Exposures to anti-White aggravated assaults

do not seem to be associated with the number of chest pain-related Emergency Department visits among either White or Black patients.

Is limited availability of local news media linked to attenuation of the reported effects among Black patients? In Table 9, I split the sample into two groups depending on the availability of daily local newspapers.[6] I provide suggestive evidence that availability of local news media is a factor mediating the reported effects on chest pain-related Emergency Department visits. Among Black patients residing in areas where daily local news is available, I find patterns analogous to the baseline results, i.e., the volume of chest pain-related Emergency Department visits increases on the day of an anti-Black aggravated assault. At the same time, among Black patients residing in areas with no daily local newspapers, I find that the volume of chest pain-related Emergency Department visits increases with a slight delay, namely one and two days after an anti-Black aggravated assault. This provides suggestive evidence that individuals residing in these areas may not be able to acquire information about local anti-Black assaults as quickly as individuals residing in areas with relative availability of local news.

The effects of anti-Black aggravated assaults on the number of chest pain-related ED visits among Black individuals persist across a range of robustness checks. Figure 14 provides the results when the outcome variable is transformed into an indicator equal to one when at least one chest pain-related Emergency Department visit is made by patients within a ZIP code; when the day-of-year fixed effects are replaced with weekday, month, and year fixed effects; when ZIP codes reporting only one hate crime throughout the sample period (and therefore potentially modifying their reporting behavior over time) are excluded; when patient demographic controls are excluded; and when equation (4) is estimated using a Poisson model so as to account for the fact that the number of chest pain-related Emergency

[6]The number of daily local newspapers is retrieved from the News Project Data (UNC Hussman School of Journalism and Media, 2023).

Department visits is censored at zero. The effects among Black patients remain significant and stable in terms of magnitude across all these specifications, while the effects among White patients continue to be insignificant and relatively small in magnitude.

Lastly, I conduct two types of placebo tests to further verify the validity of the results. First, I provide evidence that anti-Black aggravated assaults reported *after* the visit day do not affect the number of chest pain-related ED visits (see: Figure 15), which is intuitive given that the visit has already occurred. Second, I check that anti-Black aggravated assaults are not related to increases in the number of flu-related Emergency Department visits among Black or White patients (see: Table 10). Flu is not typically considered to be stress related and therefore one would not expect to observe a rise in the number of flu-related Emergency Department visits following an anti-Black aggravated assault.

6 Discussion

The number of hate crimes reported in the United States has been growing in recent years. While we are rapidly increasing our understanding of the *causes* of hate crimes (Muller and Schwarz, 2023; Cao et al., 2023), we still have relatively limited empirical evidence documenting the *consequences* of hate crimes for the targeted communities. To this end, this paper studies how local anti-Black aggravated assaults affect the health outcomes of Black infants and adults. Using restricted-use nation-wide natality data, I show that anti-Black aggravated assaults during pregnancy in the mother's county of residence are associated with decreases in birth weight and gestation length as well as increases in the incidence of low birth weights and pre-term deliveries among Black infants. I complement these results by leveraging the restricted-access Emergency Department (ED) data from California and providing evidence of increases in chest pain-related ED visits among Black patients following an anti-Black aggravated assault in their ZIP code of residence.

I find little evidence of exposures to local anti-Black aggravated assaults adversely impacting the health outcomes of White infants and adults. This underscores the salience of hate crimes specifically for the victimized groups. Anti-Black hate crimes remain the most frequently reported type of hate crime in the Untied States; however, given that hate crimes motivated by biases other than anti-Black have also been increasing, more future work should aim to examine how different kinds of hate motivated violence impact the targeted communities.

References

Aalam, A., A. Alsabban, and J. M. Pines (2020). National trends in chest pain visits in US emergency departments (2006-2016). *Emergency Medicine Journal 37*(11), 696–699.

Aizer, A., L. Stroud, and S. Buka (2012). *Maternal stress and child outcomes: Evidence from siblings*.

Almond, D. and J. Currie (2011). Killing me softly: The fetal origins hypothesis. *Journal of Economic Perspectives 25*(3), 153–172.

Almond, D., J. Currie, and V. Duque (2018). Childhood circumstances and adult outcomes: Act II. *Journal of Economic Literature 56*(4), 1360–1446.

American Public Health Association (2023). Racism is a Public Health Crisis.

Black, S., P. Devereux, and K. Salvanes (2005). *From the cradle to the labor market?nbsp; the effect of birth weight on adult outcomes*.

Brown, R. (2018). The Mexican Drug War and early-life health: The impact of violent crime on birth outcomes. *Demography 55*(1), 319–340.

Bureau of Justice Statistics (2021). Law enforcement agency identifiers crosswalk.

California Department of Health Care Access and Information (2022). Emergency department data.

Camacho, A. (2008). Stress and birth weight: Evidence from terrorist attacks. *American Economic Review 98*(2), 511–515.

Cao, A., J. M. Lindo, and J. Zhong (2023). Can social media rhetoric incite hate incidents? evidence from Trump's "Chinese virus" tweets. *Journal of Urban Economics 137*, 103590.

Centers for Disease Control and Prevention (2023). Multiple Births.

Cleveland Clinic (2022). Noncardiac Chest Pain.

Currie, J., M. Mueller-Smith, and M. Rossin-Slater (2022). Violence while in utero: The impact of assaults during pregnancy on birth outcomes. *The Review of Economics and Statistics 104*(3), 525–540.

Curtis, D. S., T. Washburn, H. Lee, K. R. Smith, J. Kim, C. D. Martz, M. R. Kramer, and D. H. Chae (2021). Highly public anti-black violence is associated with poor mental health days for Black Americans. *Proceedings of the National Academy of Sciences 118*(17).

Duncan, B., H. Mansour, and D. I. Rees (2016). It's just a game. *Journal of Human Resources 52*(4), 946–978.

Dursun, B. (2019). The intergenerational effects of mass shootings. *SSRN Electronic Journal*.

Federal Bureau of Investigation (2010). Violent Crime.

Federal Bureau of Investigation (2017). Aggravated Assault.

Federal Bureau of Investigation (2022). Hate crime statistics.

Florida Department of Law Enforcement (2021). Florida Supplemental Homicide Reports.

Gemmill, A., R. Catalano, J. A. Casey, D. Karasek, H. E. Alcala, H. Elser, and J. M. Torres (2019). Association of preterm births among US latina women with the 2016 presidential election. *JAMA Network Open 2*(7).

Geronimus, A. T. (1992). The weathering hypothesis and the health of African American women and infants: Evidence and speculations. *Ethnicity Disease 2*(3), 207–221.

Goin, D. E., A. M. Gomez, K. Farkas, C. Duarte, D. Karasek, B. D. Chambers, A. V. Jackson, and J. Ahern (2021). Occurrence of fatal police violence during pregnancy and hazard of preterm birth in California. *Paediatric and Perinatal Epidemiology 35*(4), 469–478.

Herrera, C. L., M. E. Bowman, D. D. McIntire, D. B. Nelson, and R. Smith (2021). Revisiting the placental clock: Early corticotrophin-releasing hormone rise in recurrent preterm birth. *PLOS ONE 16*(9).

Jahn, J. L., N. Krieger, M. Agenor, M. Leung, B. A. Davis, M. G. Weisskopf, and J. T. Chen (2021). Gestational exposure to fatal police violence and pregnancy loss in US Core Based Statistical Areas, 2013-2015. *EClinicalMedicine 36*, 100901.

Kaplan, J. (2020). Jacob Kaplan's Concatenated Files: Uniform Crime Reporting Program Data: Offenses Known and Clearances by Arrest.

Kaplan, J. (2021). Jacob Kaplan's Concatenated Files: Uniform Crime Reporting Program Data: Supplementary Homicide Reports, 1976-2020.

Kaplan, J. (2023). Uniform Crime Reporting (UCR) Program Data: A Practitioner's Guide.

Kim, H., G. Jeong, Y. K. Park, and S. W. Kang (2018). Sleep quality and nutritional intake in subjects with sleep issues according to perceived stress levels. *Journal of Lifestyle Medicine 8*(1), 42–49.

Lauderdale, D. S. (2006). Birth outcomes for Arabic-named women in California before and after September 11. *Demography 43*(1), 185–201.

Leor, J., W. K. Poole, and R. A. Kloner (1996). Sudden cardiac death triggered by an earthquake. *New England Journal of Medicine 334*(7), 413–419.

Levine, G. N. (2022). Psychological stress and heart disease: Fact or folklore? *The American Journal of Medicine 135*(6), 688–696.

Lichtman-Sadot, S., N. Benshalom-Tirosh, and E. Sheiner (2022). Conflict, rockets, and birth outcomes: Evidence from Israel's operation protective edge. *Journal of Demographic Economics*, 1–27.

Mansour, H. and D. I. Rees (2012). Armed conflict and birth weight: Evidence from the al-Aqsa intifada. *Journal of Development Economics 99*(1), 190–199.

March of Dimes (2023). A profile of prematurity in the United States.

Marsh, H. (1991). A comparative analysis of crime coverage in newspapers in the United States and other countries from 1960-1989: A review of the literature. *Journal of Criminal Justice 19*(1), 67–79.

Martell, M. (2023). Economic Costs of Hate Crimes.

McLean, M., A. Bisits, J. Davies, R. Woods, P. Lowry, and R. Smith (1995). A placental clock controlling the length of human pregnancy. *Nature Medicine 1*(5), 460–463.

Meisel, S., K. Dayan, H. Pauzner, I. Chetboun, Y. Arbel, D. David, and I. Kutz (1991). Effect of iraqi missile war on incidence of acute myocardial infarction and sudden death in israeli civilians. *The Lancet 338*(8768), 660–661.

Muller, K. and C. Schwarz (2023, July). From hashtag to hate crime: Twitter and antiminority sentiment. *American Economic Journal: Applied Economics 15*(3), 270–312.

National Center for Chronic Disease Prevention and Health Promotion (2022). Heart Attack Symptoms, Risk, and Recovery.

National Center for Health Statistics (2021). All-county natality files for 1989 - 2019, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program.

Natsui, S., B. C. Sun, E. Shen, R. F. Redberg, M. Ferencik, M.-S. Lee, V. Musigdilok, Y.-L. Wu, C. Zheng, A. A. Kawatkar, and et al. (2021). Higher emergency physician chest pain hospitalization rates do not lead to improved patient outcomes. *Circulation: Cardiovascular Quality and Outcomes 14*(1).

Office of Minority Health (2023a). Infant Mortality and African Americans.

Office of Minority Health (2023b). Minority Population Profiles: Black/African American.

Office of the Law Revision Counsel (2021). Hate Crime Statistics Act.

O'Hear, M. (2020). Violent crime and media coverage in One city: A statistical snapshot.

Persson, P. and M. Rossin-Slater (2018). Family ruptures, stress, and the mental health of the next generation. *American Economic Review 108*(4-5), 1214–1252.

Powdthavee, N. (2005). Unhappiness and crime: Evidence from South Africa. *Economica 72*(287), 531–547.

Quintana-Domeque, C. and P. Rodenas-Serrano (2017). The hidden costs of terrorism: The effects on health at birth. *Journal of Health Economics 56*, 47–60.

Royer, H. (2009). Separated at girth: Us twin estimates of the effects of birth weight. *American Economic Journal: Applied Economics 1*(1), 49–85.

Rui, P., K. Kang, and M. Albert (2013). National Hospital Ambulatory Medical Care Survey: 2013 Emergency Department Summary Tables.

Samari, G., R. Catalano, H. E. Alcala, and A. Gemmill (2020). The Muslim ban and preterm birth: Analysis of U.S. Vital Statistics data from 2009 to 2018. *Social Science Medicine 265*, 113544.

Schetter, C. D. (2009). Stress processes in pregnancy and preterm birth. *Current Directions in Psychological Science 18*(4), 205–209.

Steinberg, J. S., A. Arshad, M. Kowalski, A. Kukar, V. Suma, M. Vloka, F. Ehlert, B. Herweg, J. Donnelly, J. Philip, and et al. (2004). Increased incidence of life-threatening ventricular arrhythmias in implantable defibrillator patients after the world trade center attack. *Journal of the American College of Cardiology 44*(6), 1261–1264.

Stults-Kolehmainen, M. A. and R. Sinha (2013). The effects of stress on physical activity and exercise. *Sports Medicine 44*(1), 81–121.

The Lifespan of News Stories (2019). Violence and War.

Torche, F. (2011). The effect of maternal stress on birth outcomes: Exploiting a natural experiment. *Demography 48*(4), 1473–1491.

Torche, F. and A. Villarreal (2014). Prenatal exposure to violence and birth weight in Mexico. *American Sociological Review 79*(5), 966–992.

Trichopoulos, D., X. Zavitsanos, K. Katsouyanni, A. Tzonou, and P. Dalla-Vorgia (1983). Psychological stress and fatal heart attack: The Athens (1981) earthquake natural experiment. *The Lancet 321*(8322), 441–444.

UNC Hussman School of Journalism and Media (2023). The News Desert Project.

United States Census (2022). Datasets.

University of Utah Health (2023). Preterm labor: what are the causes and symptoms?

U.S. Bureau of Labor Statistics (2021). Local Area Unemployment Statistics.

Vu, H. (2021). I Wish I Were Born in Another Time: Unintended Consequences of Immigration Enforcement on Birth Outcomes.

Vu, H., H. Noghanibehambari, J. Fletcher, and T. Green (2023, June). Prenatal exposure to racial violence and later life mortality among males: Evidence from lynching.

Webb, D. A., L. Mathew, and J. F. Culhane (2014). Lessons learned from the philadelphia collaborative preterm prevention project: The prevalence of risk factors and program participation rates among women in the intervention group. *BMC Pregnancy and Childbirth 14*(1).

Wilbert-Lampen, U., D. Leistner, S. Greven, T. Pohl, S. Sper, C. Volker, D. Guthlin, A. Plasse, A. Knez, H. Kuchenhoff, and et al. (2008). Cardiovascular events during world cup soccer. *New England Journal of Medicine 358*(5), 475–483.

World Health Organization (2014). Global nutrition targets 2025: Low birth weight policy brief.

World Health Organization (2018). Preterm birth.

Figures and tables

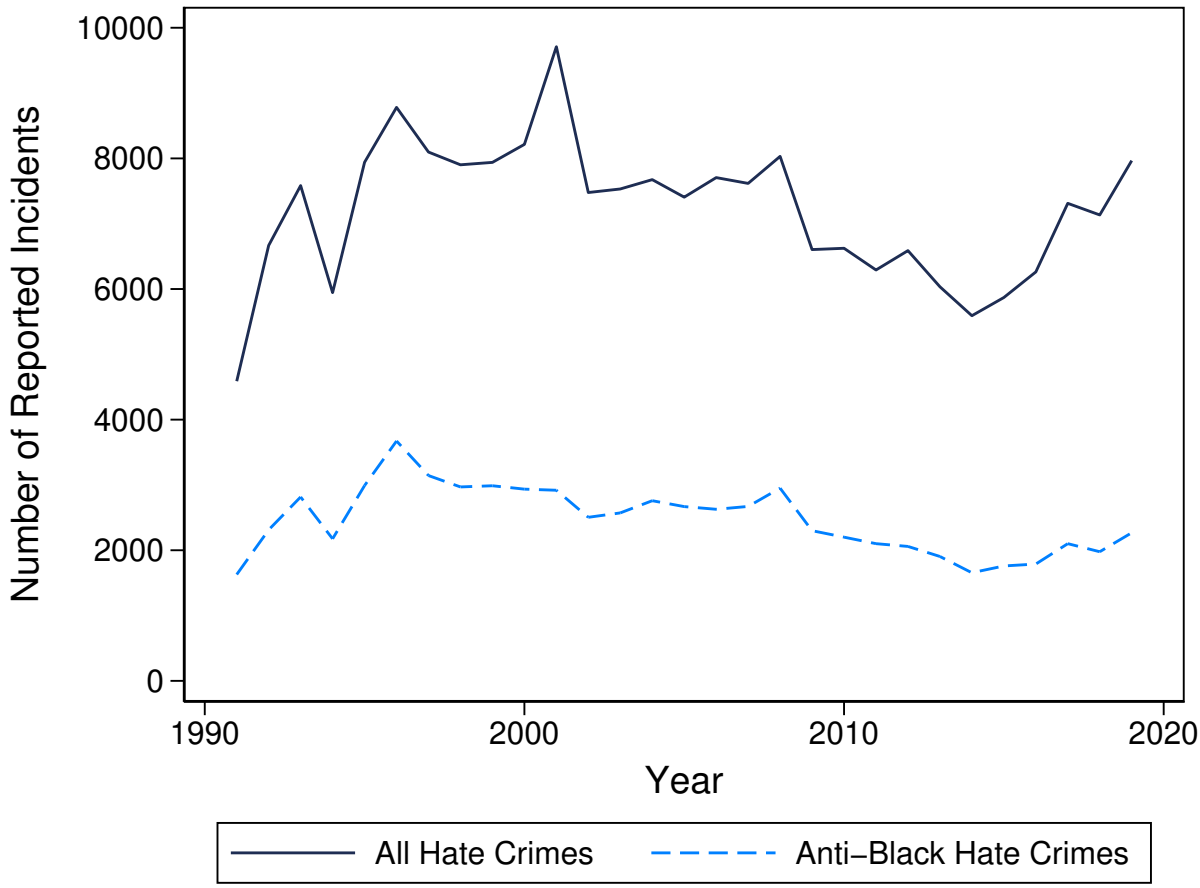


Figure 1: Total Number of Hate Crimes Reported in the United States Per Year, 1991-2019
Notes: "All hate crimes" include all hate crimes reported in the United States, regardless of bias motivation. "Anti-Black hate crimes" include all hate crimes motivated by a bias against Black or African American individuals. Incidents reported outside of the contiguous United States are excluded.

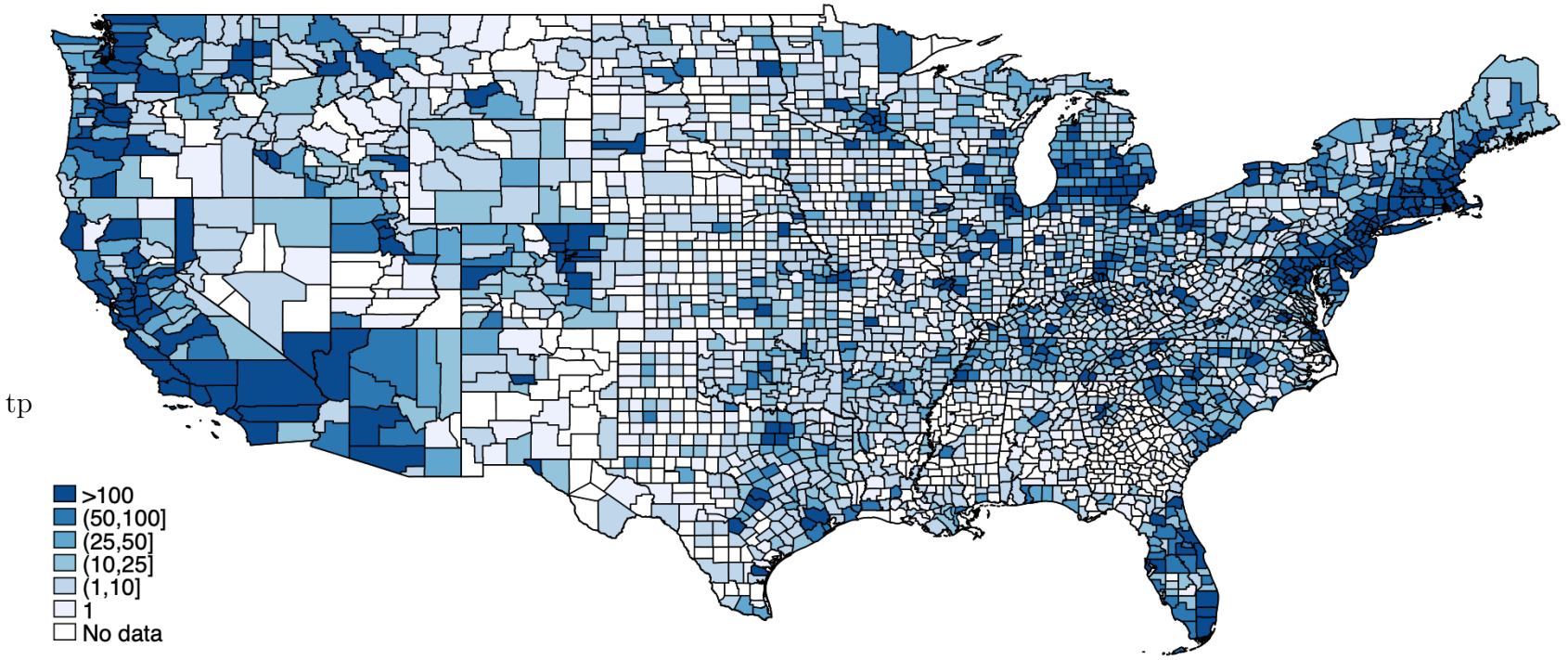
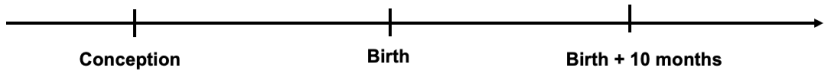
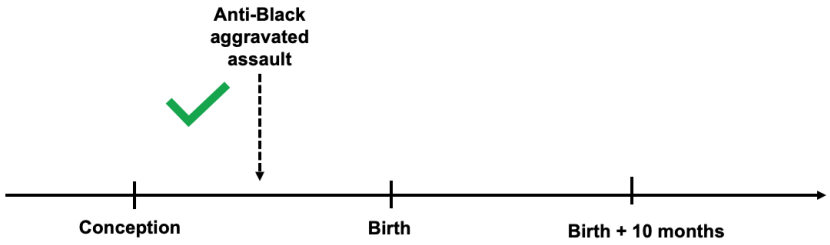


Figure 2: Geographic Variation in the Total Number of Hate Crimes Reported by Counties Throughout the Sample Period (1991-2019)

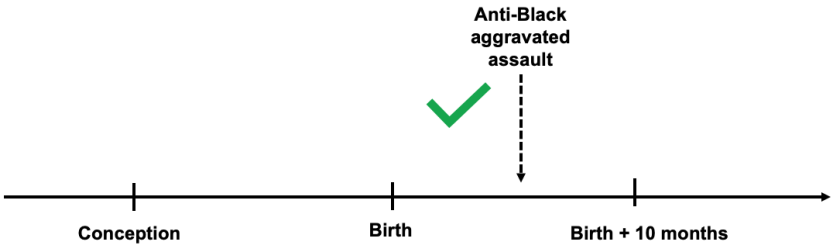
Notes: "Total Number of Hate Crimes" refers to the sum of all hate crimes reported by agencies within a county from 1991 through 2019. Incidents reported outside of the contiguous United States are excluded.



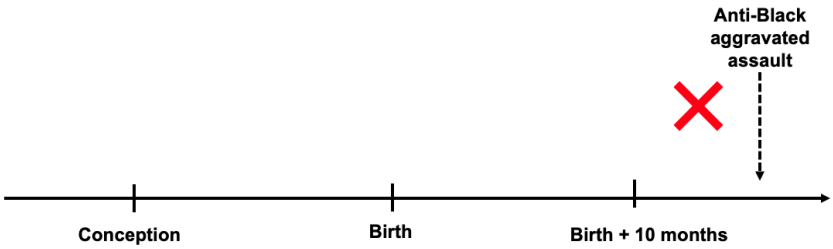
(a) Timeline defined in terms of conception, birth, and the 10th month after birth.



(b) Mothers residing in counties that report at least one anti-Black aggravated assault during pregnancy are included in the sample.



(c) Mothers residing in counties that report at least one anti-Black aggravated assault up to 10 months after birth are included in the sample.

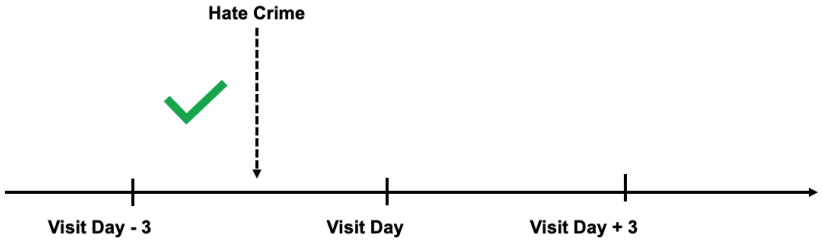


(d) Mothers residing in counties that report anti-Black aggravated assaults over 10 months after birth are excluded from the sample.

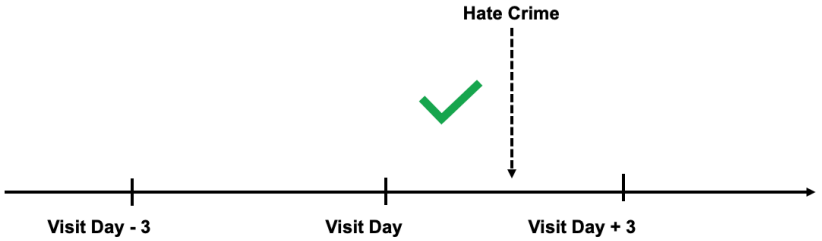
Figure 3: Sample Design for Study I (Birth Outcomes)

Notes: "Conception" refers to the month and year obtained by subtracting gestation length from the actual birth month and year. "Birth" refers to the month and year obtained by adding nine months to the expected month and year of conception. "Birth + 10 months" refers to the 10th month after the expected birth month.

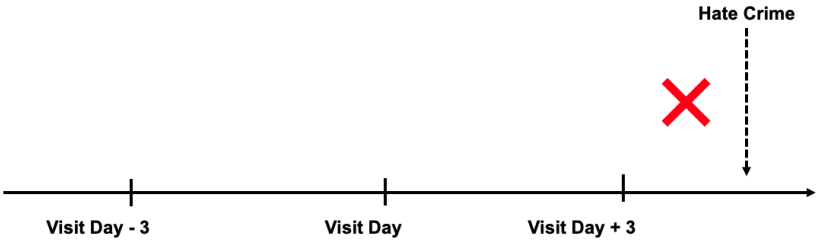
(a) Timeline defined in terms of the third day before the visit day, the visit day, and the third day after the visit day.



(b) Patients residing in ZIP codes that report at least one hate crime up to three days before or on the visit day are included in the sample.



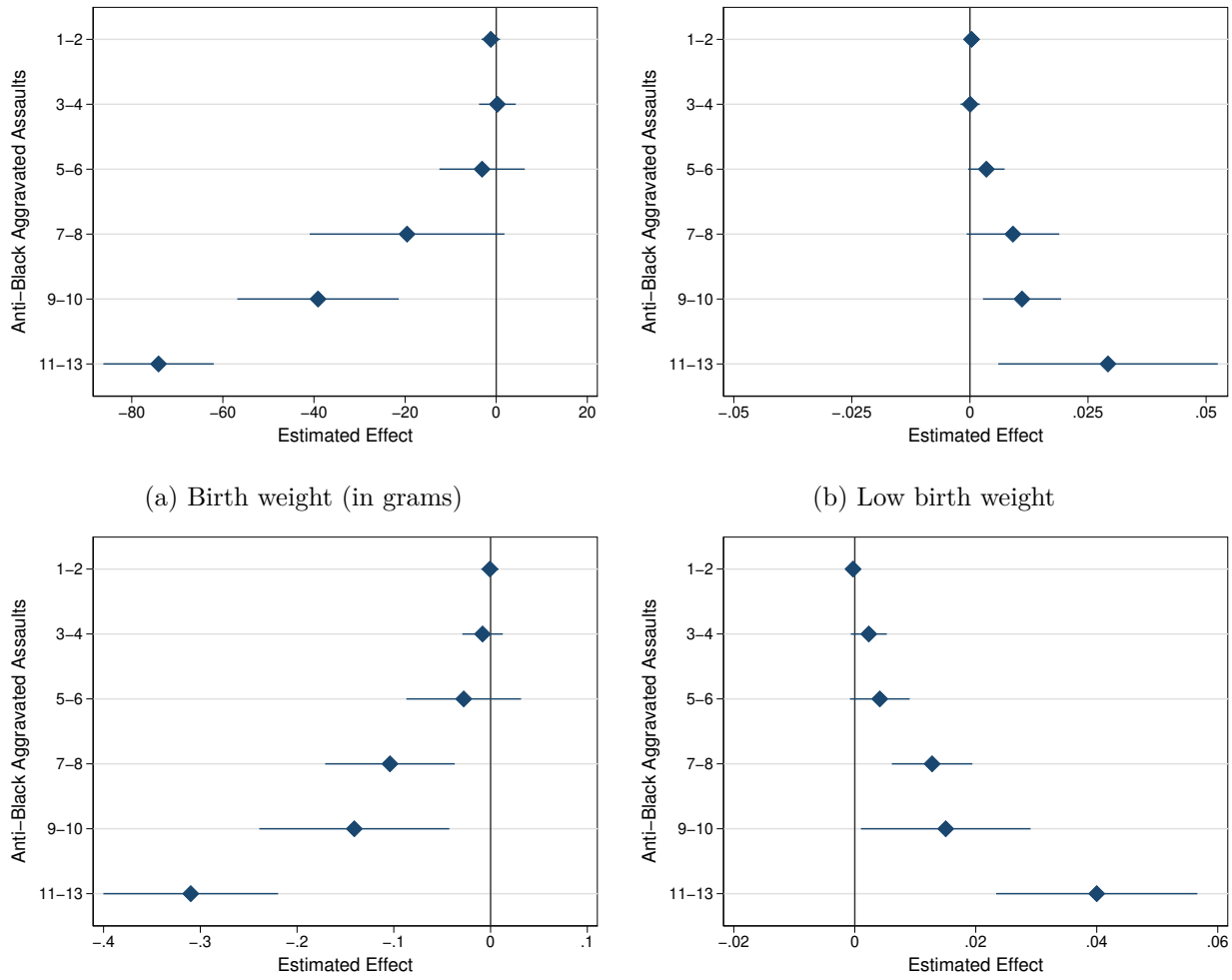
(c) Patients residing in ZIP codes that report at least one hate crime up to three days after the visit day are included in the sample.



(d) Patients residing in ZIP codes that report at least one hate crime over three days after the visit day are not included in the sample.

Figure 4: Sample Design for Study II (Emergency Department Visits)

Notes: "Visit Day" refers to the day of the chest pain related Emergency Department visit; "Visit Day - 3" refers to the third day before the day of the chest pain related Emergency Department visit; "Visit Day + 3" refers to the third day after the day of the chest pain related Emergency Department visit.



(a) Birth weight (in grams)

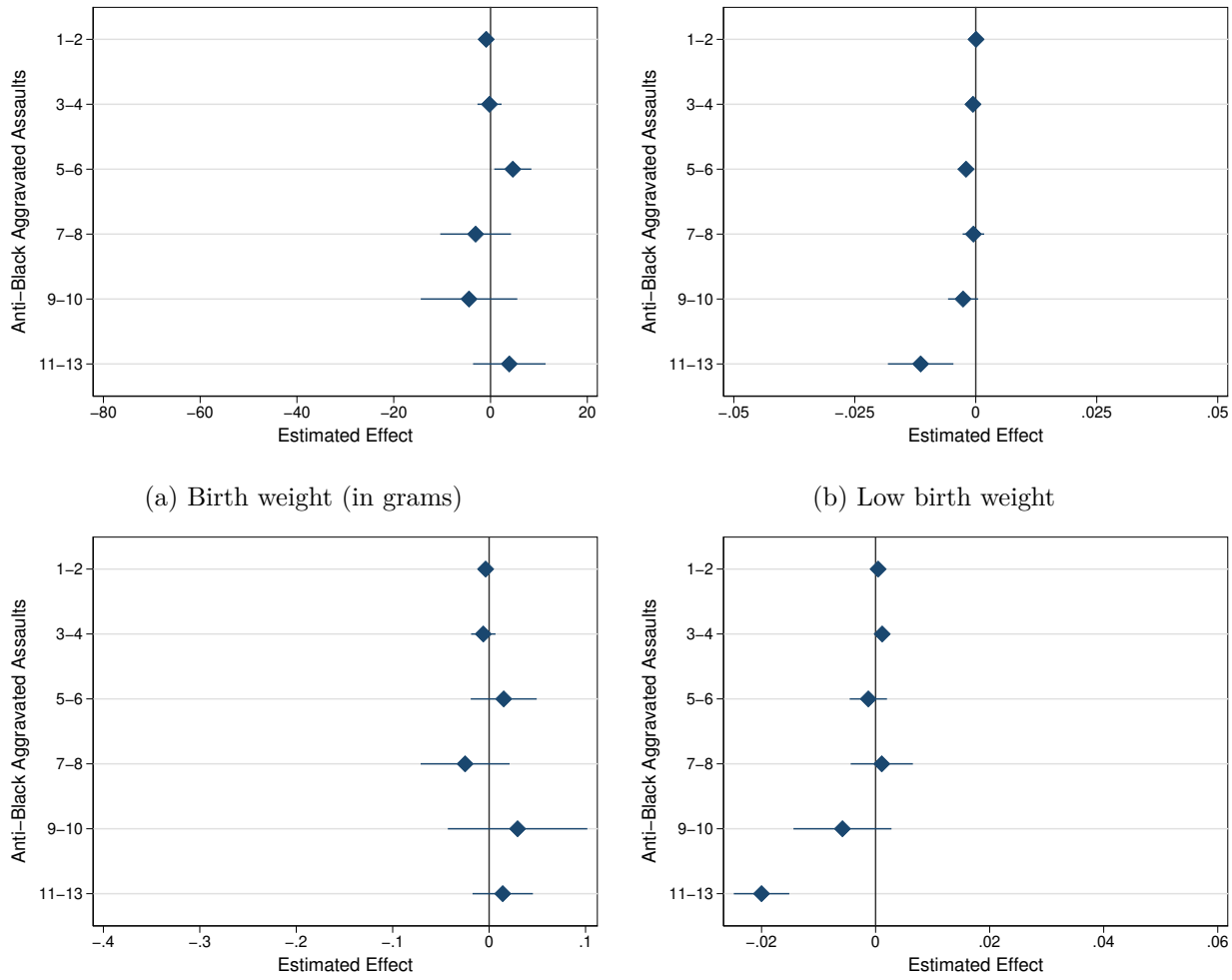
(b) Low birth weight

(c) Gestation length (in weeks)

(d) Pre-term delivery

Figure 5: Black Mothers–Non-Linear Effects of In Utero Exposure to Anti-Black Aggravated Assaults on Birth Outcomes

Notes: Each diamond depicts a coefficient estimate and each whisker depicts the estimated 95% confidence interval. "1-2" is a binary variable equal to one when a mother is exposed to 1 or 2 anti-Black aggravated assaults during pregnancy. "3-4" is a binary variable equal to one when a mother is exposed to 3 or 4 anti-Black aggravated assaults during pregnancy. "5-6", "7-8", "9-10", and "11-13" are binary variables which are defined analogously.



(a) Birth weight (in grams)

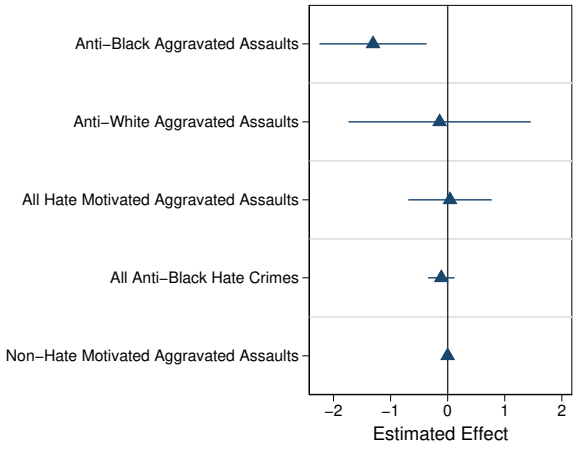
(b) Low birth weight

(c) Gestation length (in weeks)

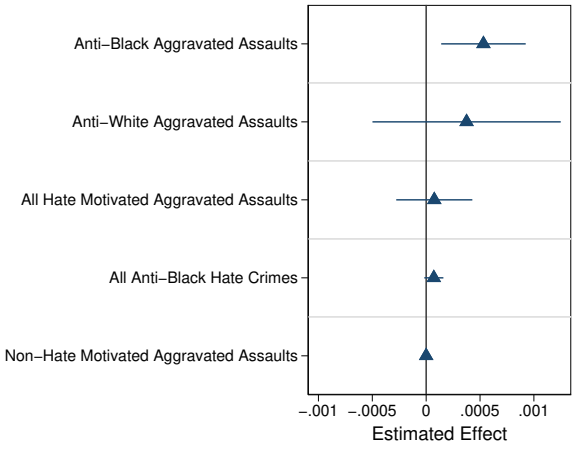
(d) Pre-term delivery

Figure 6: White Mothers–Non-Linear Effects of In Utero Exposure to Anti-Black Aggravated Assaults on Birth Outcomes

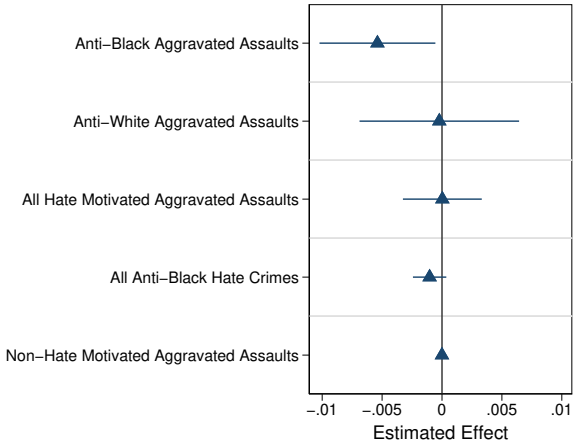
Notes: Each diamond depicts a coefficient estimate and each whisker depicts the estimated 95% confidence interval. "1-2" is a binary variable equal to one when a mother is exposed to 1 or 2 anti-Black aggravated assaults during pregnancy. "3-4" is a binary variable equal to one when a mother is exposed to 3 or 4 anti-Black aggravated assaults during pregnancy. "5-6", "7-8", "9-10", and "11-13" are binary variables which are defined analogously.



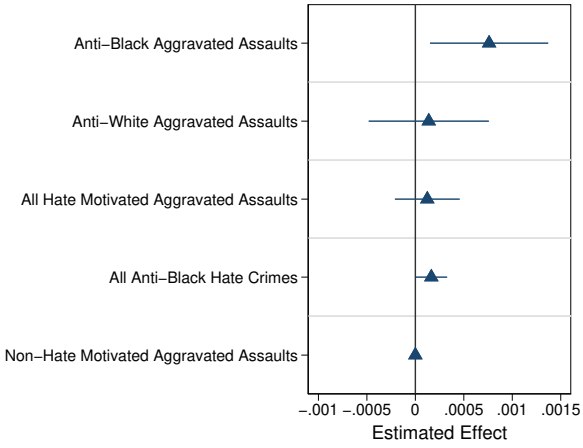
(a) Birth weight (in grams)



(b) Low birth weight



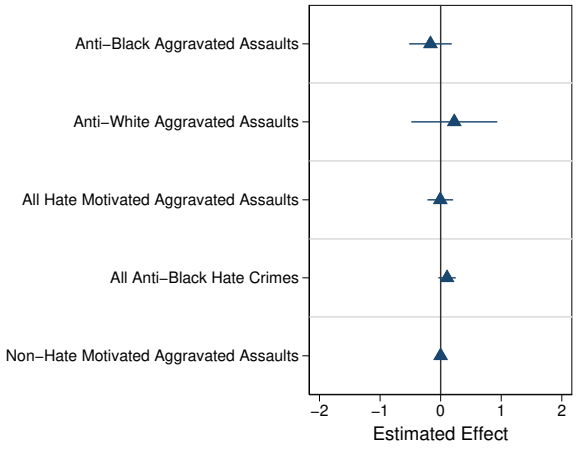
(c) Gestation length (in weeks)



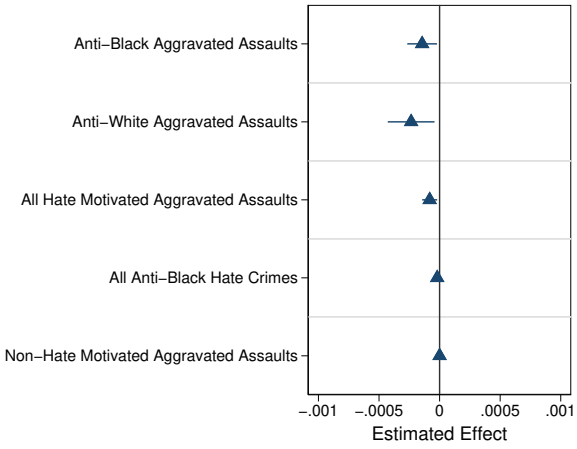
(d) Pre-term delivery

Figure 7: Black Mothers–Effects of In Utero Exposure to Anti-Black Aggravated Assaults and Other Crimes on Birth Outcomes

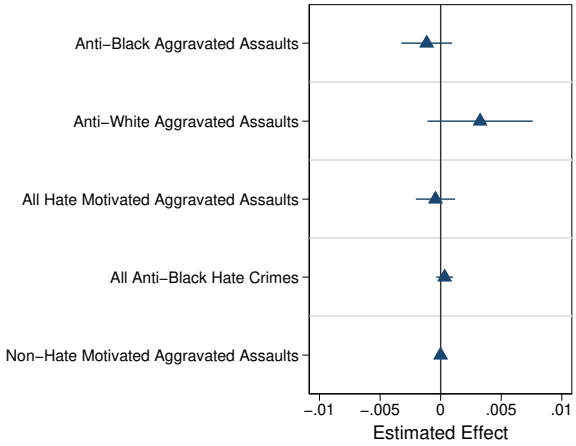
Notes: Each triangle depicts a coefficient estimate from a separate regression model; each whisker depicts the estimated 95% confidence interval. "Anti-Black Aggravated Assaults" refer to aggravated assaults motivated by an anti-Black bias. "Anti-White Aggravated Assaults" refer to aggravated assaults motivated by an anti-White bias. "All Hate Motivated Aggravated Assaults" refer to hate-motivated aggravated assaults regardless of bias motivation. "All Anti-Black Hate Crimes " refer to all anti-Black hate crimes regardless of offense type. "Non-Hate Motivated Aggravated Assaults" refer to all aggravated assaults not classified as hate motivated.



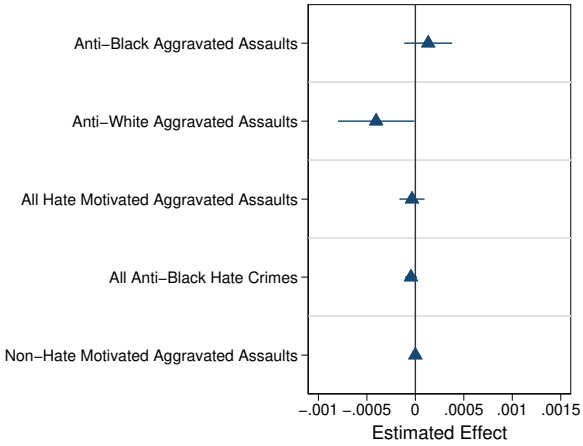
(a) Birth weight (in grams)



(b) Low birth weight



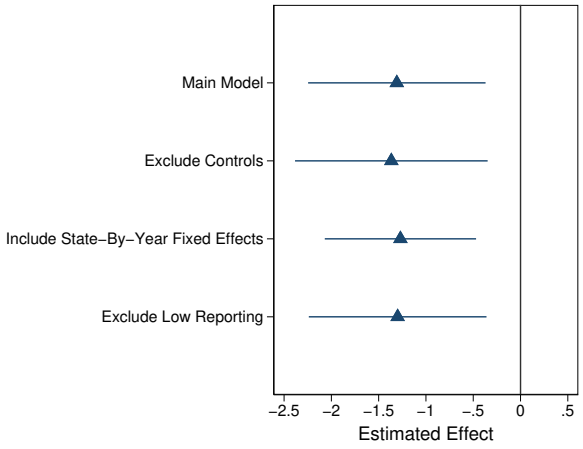
(c) Gestation length (in weeks)



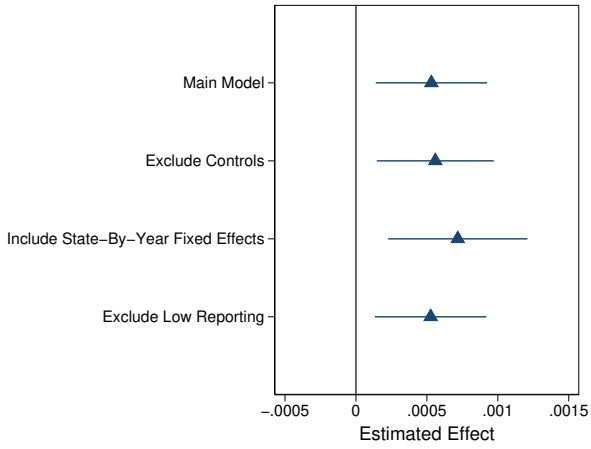
(d) Pre-term delivery

Figure 8: White Mothers–Effects of In Utero Exposure to Anti-Black Aggravated Assaults and Other Crimes on Birth Outcomes

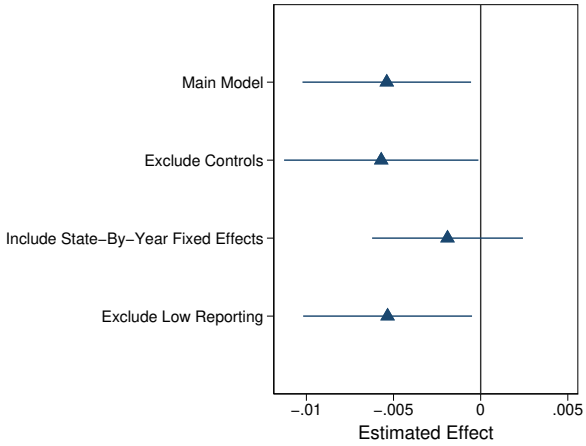
Notes: Each triangle depicts a coefficient estimate from a separate regression model; each whisker depicts the estimated 95% confidence interval. "Anti-Black Aggravated Assaults" refer to aggravated assaults motivated by an anti-Black bias. "Anti-White Aggravated Assaults" refer to aggravated assaults motivated by an anti-White bias. "All Hate Motivated Aggravated Assaults" refer to hate-motivated aggravated assaults regardless of bias motivation. "All Anti-Black Hate Crimes " refer to all anti-Black hate crimes regardless of offense type. "Non-Hate Motivated Aggravated Assaults" refer to all aggravated assaults not classified as hate motivated.



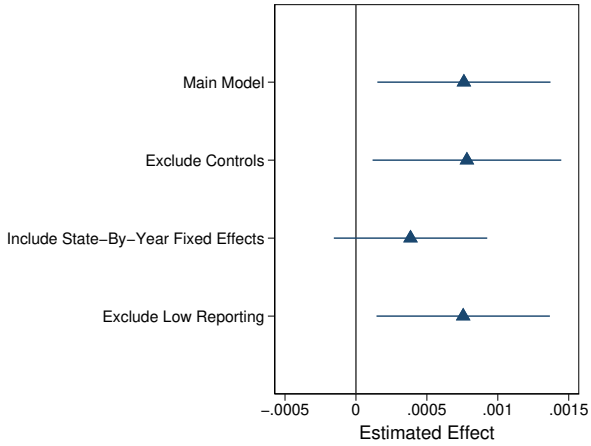
(a) Birth weight (in grams).



(b) Low birth weight.



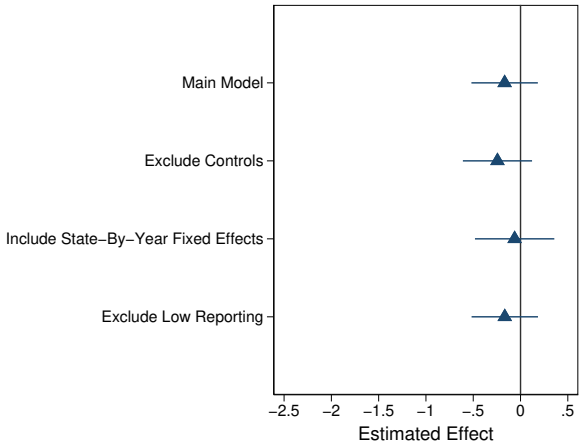
(c) Gestation length (in weeks).



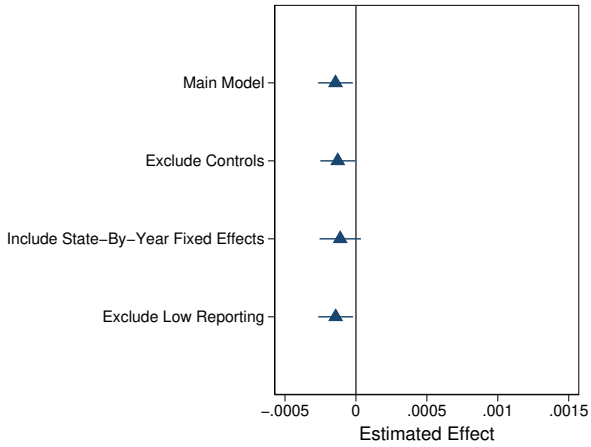
(d) Pre-term delivery.

Figure 9: Black Mothers–Robustness of Effects of In Utero Exposure to Anti-Black Aggravated Assaults to Changes in Model Specification and Sample Restrictions

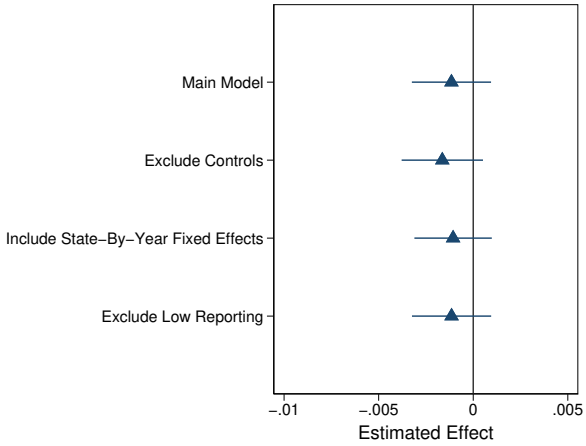
Notes: Each triangle depicts a coefficient estimate from a separate regression model; each whisker depicts the estimated 95% confidence interval. "Main Model" refers to the effect of in utero exposure to anti-Black aggravated assaults on birth outcomes estimated using equation (2). "Exclude Controls" refers to the effect estimated using equation (2) but excluding controls for maternal demographics and county-level characteristics. "Include State-By-Year-Fixed Effects" refers to the effect estimated using equation (2) but including state-by-year fixed effects alongside the county and month-by-year fixed effect. "Exclude Low Reporting" refers to the effect estimated using equation (2) but excluding the counties which report only one hate crime throughout the sample period.



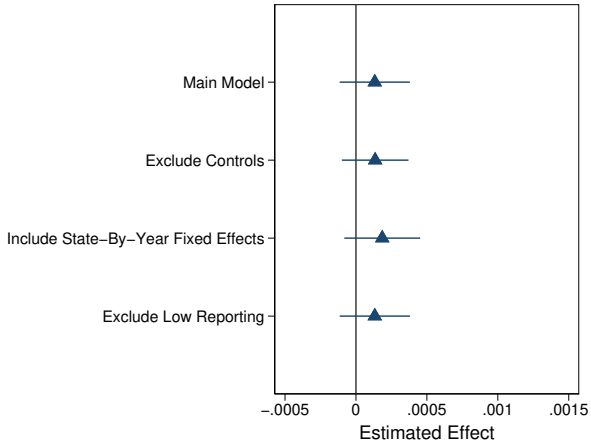
(a) Birth weight (in grams).



(b) Low birth weight.



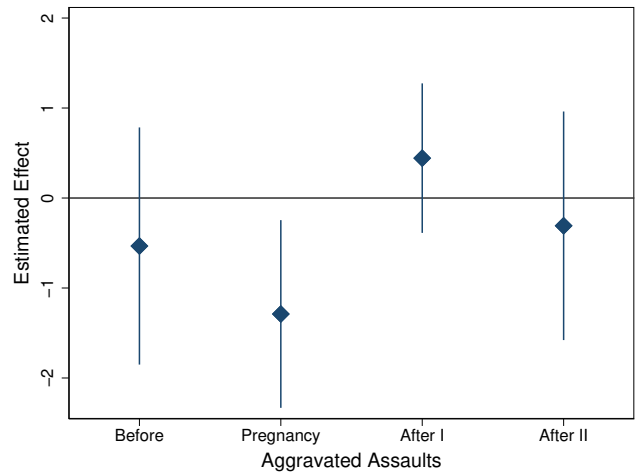
(c) Gestation length (in weeks).



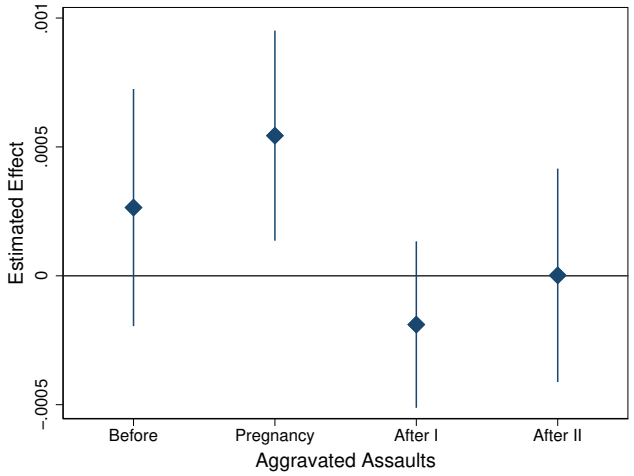
(d) Pre-term delivery.

Figure 10: White Mothers–Robustness of Effects of In Utero Anti-Black Aggravated Assaults to Changes in Model Specification and Sample Restrictions

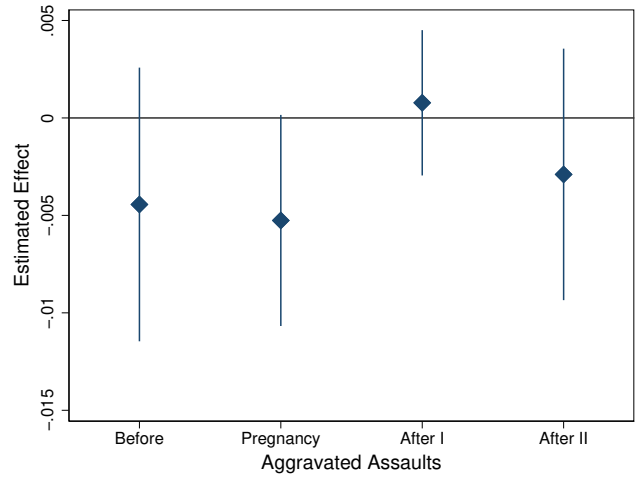
Notes: Each triangle depicts a coefficient estimate from a separate regression model; each whisker depicts the estimated 95% confidence interval. "Main Model" refers to the effect of in utero exposure to anti-Black aggravated assaults on birth outcomes estimated using equation (2). "Exclude Controls" refers to the effect estimated using equation (2) but excluding controls for maternal demographics and county-level characteristics. "Include State-By-Year-Fixed Effects" refers to the effect estimated using equation (2) but including state-by-year fixed effects alongside the county and month-by-year fixed effect. "Exclude Low Reporting" refers to the effect estimated using equation (2) but excluding the counties which report only one hate crime throughout the sample period.



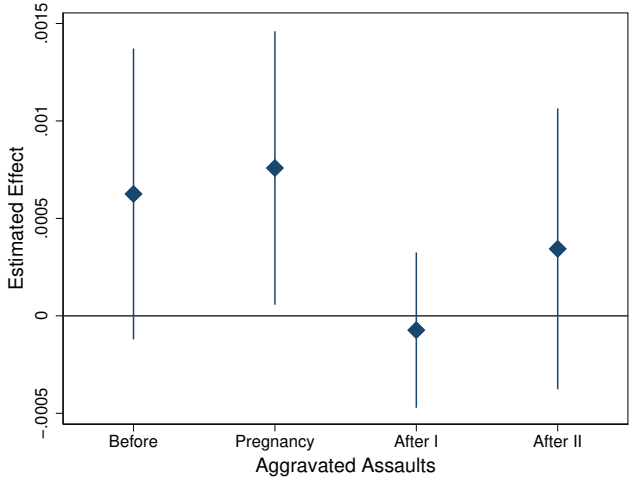
(a) Birth weight (in grams)



(b) Low birth weight



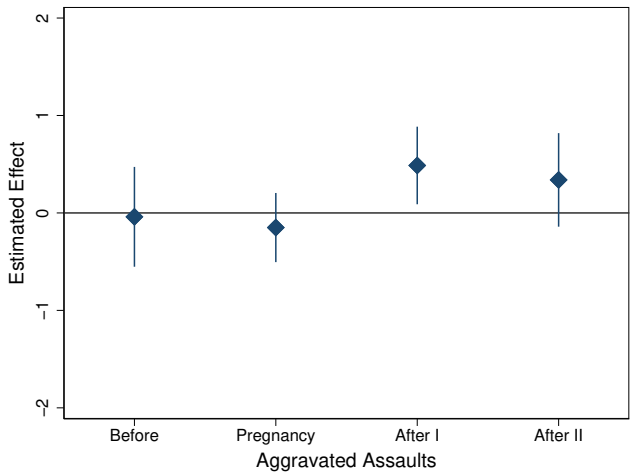
(c) Gestation length (in weeks)



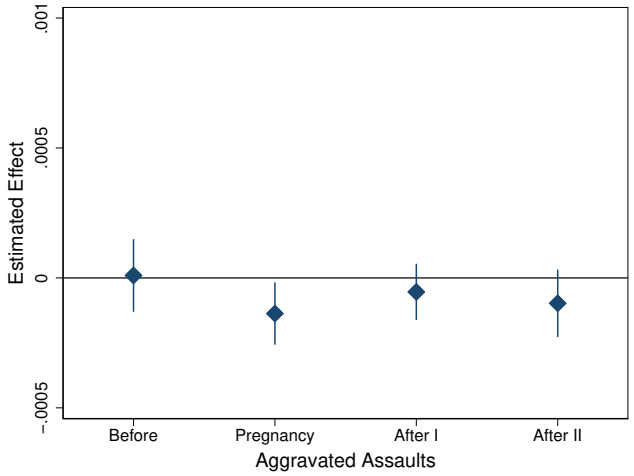
(d) Pre-term delivery

Figure 11: Black Mothers–Placebo Effects of Anti-Black Aggravated Assaults Reported Before Conception and After Birth on Birth Outcomes

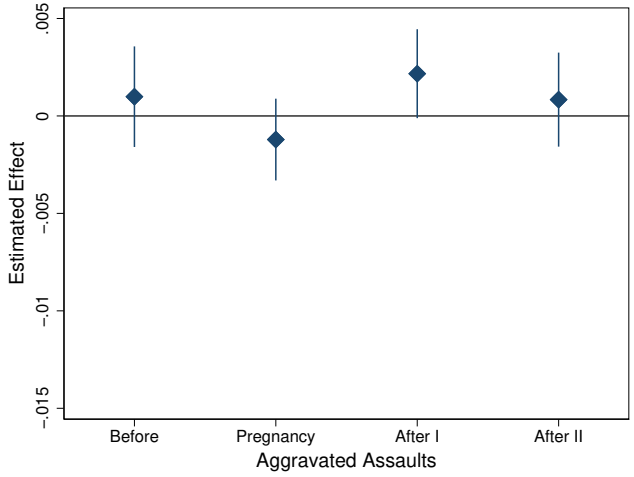
Notes: Each diamond depicts a coefficient estimate and each whisker depicts the estimated 95% confidence interval. "Before" refers to the effect of exposure to anti-Black aggravated assaults up to 10 months prior to expected conception. "Pregnancy" refers to the effect of exposure to anti-Black aggravated assaults during pregnancy. "After I" refers to the effect of exposure to anti-Black aggravated assaults from 1 up to 10 months after to expected birth. "After II" refers to the effect of exposure to anti-Black aggravated assaults from 11 up to 20 months after expected birth.



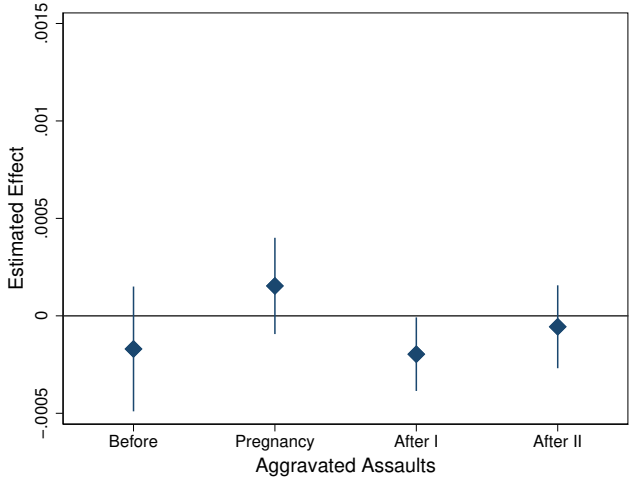
(a) Birth weight (in grams)



(b) Low birth weight



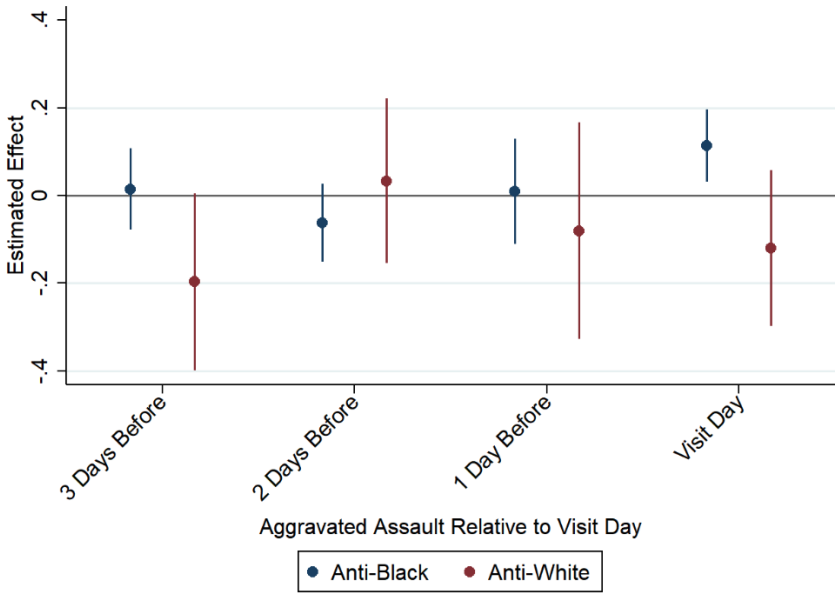
(c) Gestation length (in weeks)



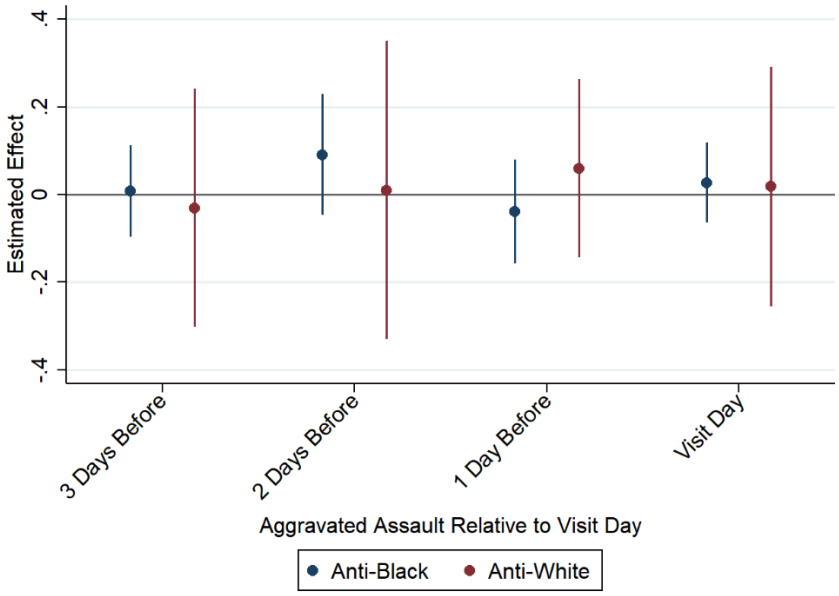
(d) Pre-term delivery

Figure 12: White Mothers–Placebo Effects of Anti-Black Aggravated Assaults Reported Before Conception and After Birth on Birth Outcomes

Notes: Each diamond depicts a coefficient estimate and each whisker depicts the estimated 95% confidence interval. "Before" refers to the effect of exposure to anti-Black aggravated assaults up to 10 months prior to expected conception. "Pregnancy" refers to the effect of exposure to anti-Black aggravated assaults during pregnancy. "After I" refers to the effect of exposure to anti-Black aggravated assaults from 1 up to 10 months after to expected birth. "After II" refers to the effect of exposure to anti-Black aggravated assaults from 11 up to 20 months after expected birth.



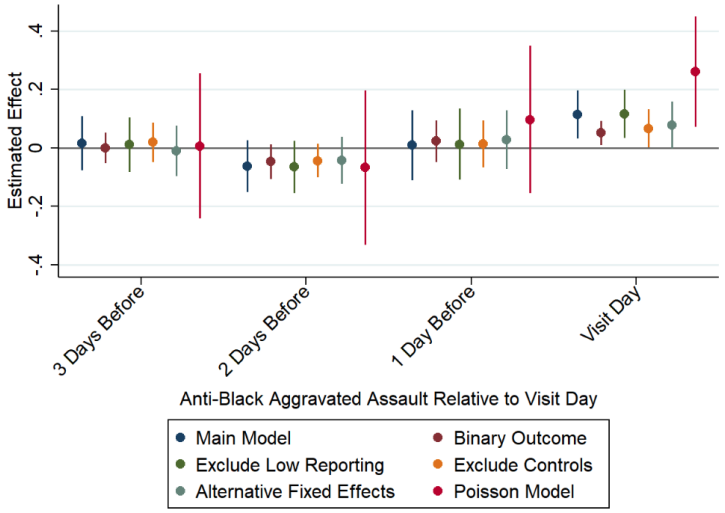
(a) Black Patients.



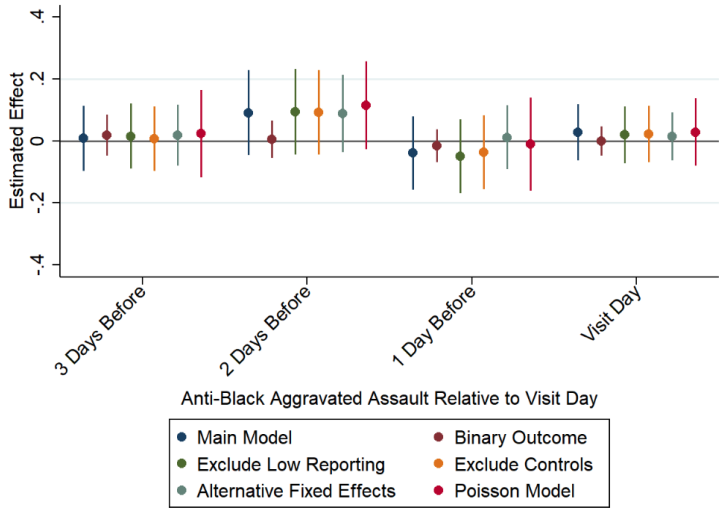
(b) White Patients.

Figure 13: Effects of Anti-Black and Anti-White Aggravated Assaults on the Number of Chest Pain Emergency Department Visits Among Black and White Patients

Notes: Each circle depicts a coefficient and each whisker depicts the estimated 95% confidence interval. "3 Days Before", "2 Days Before", and "1 Day Before" refer to the effect of aggravated assaults reported three, two, and one day before the visit day. "Visit Day" refers to the effect of aggravated assaults reported on the visit day. "Anti-Black" refers to anti-Black aggravated assaults reported in the patient's ZIP code of residence; "Anti-White" refers to anti-White aggravated assaults reported in the patient's ZIP code of residence.



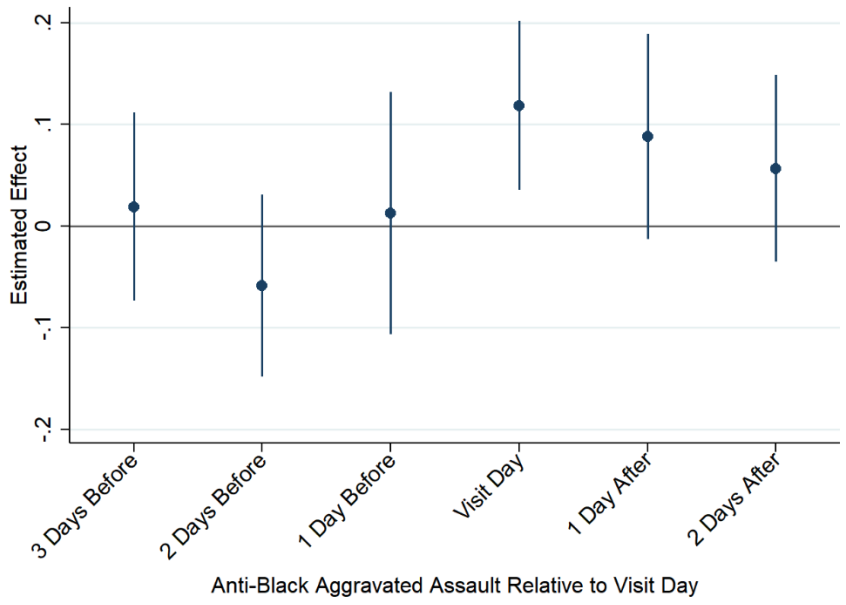
(a) Black Patients.



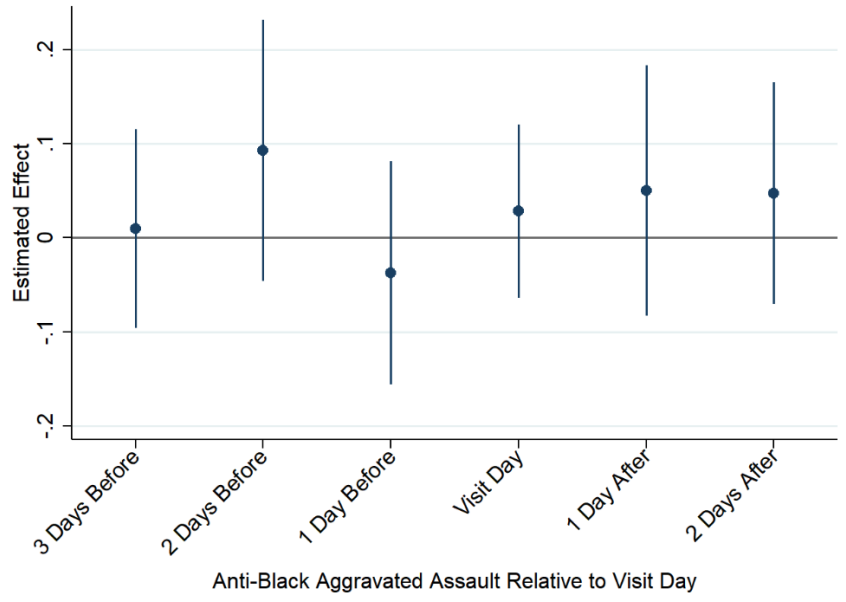
(b) White Patients.

Figure 14: Effects of Anti-Black Aggravated Assaults Reported Three, Two, and One Day Before Visit Day or on the Visit Day on the Number of Chest Pain Emergency Department Visits–Robustness to Model Specifications

Notes: Each circle depicts a coefficient and each whisker depicts the estimated 95% confidence interval. "Main Model" refers to the baseline model estimated using equation (4). "Binary Outcome" refers to the baseline model estimated using equation (4) when the outcome variable is a binary indicator equal to one when at least one chest pain-related ED visit is made by patients in ZIP code z on day *t*. "Exclude Low Reporting" refers to the model estimated using equation (4) and excluding the ZIP codes which report only one hate crime throughout the sample period. "Exclude Controls" refers to the model estimated using equation (4) and excluding the patient demographic controls. "Alternative Fixed Effects" refers to the model estimated using equation (4) but including year, month, and weekday fixed effects instead of day-of-year fixed effects. "Poisson Model" refers to a Poisson model estimated using equation (4) and including year, month, and weekday fixed effects instead of day-of-year fixed effects. "3 Days Before", "2 Days Before", and "1 Day Before" refer to the effect of aggravated assaults reported three, two, and one day before the visit day. "Visit Day" refers to the effect of anti-Black aggravated assaults on the day of the visit.



(a) Black Patients.



(b) White Patients.

Figure 15: Placebo Effects of Anti-Black Aggravated Assaults Reported After the Visit Day on the Number of Chest Pain Emergency Department Visits Among Black and White Patients

Notes: Each circle depicts a coefficient and each whisker depicts the estimated 95% confidence interval. "3 Days Before", "2 Days Before", and "1 Day Before" refer to the effect of anti-Black aggravated assaults reported three, two, and one day before the visit day. "Visit Day" refers to the effect of anti-Black aggravated assaults reported on the visit day. "2 Days After", and "1 Day After" refer to the effect of anti-Black aggravated assaults reported two and one day after the visit day.

Table 1: Comparison of the Two Studies Provided in This Paper

	Study 1	**Study 2**
Outcome	Infant health at birth	Adult chest pain
Data	Natality Records	Emergency Department Data
Data provider	National Center for Health Statistics	California Department of Public Health and Information
Effects	Intergenerational	Immediate
Sample	Nation-wide, 1991-2019	California, 2011-2019
Treatment level	County-by-month	ZIP code-by-day

Table 2: Summary Statistics

Panel A: Hate Crimes	Mean	St. Dev.
All hate crimes	85.940	448.857
Anti-Black hate crimes	29.358	134.888
Anti-Black aggravated assaults	3.532	24.252

	Black Mothers		*White Mothers*	
Panel B: Natality Data	Mean	St. Dev.	Mean	St. Dev.
Birth weight (grams)	3,130.446	88.596	3,398.254	69.298
Low birth weight	0.112	0.039	0.052	0.038
Gestation length (weeks)	38.378	0.403	38.997	0.290
Preterm delivery	0.153	0.050	0.083	0.026
Mother's age	25.760	3.106	27.912	2.074
Married	0.341	0.246	0.718	0.137
Less than high school degree	0.205	0.197	0.109	0.083
College degree or more	0.128	0.167	0.310	0.178
First child	0.382	0.215	0.421	0.086
Male child	0.509	0.217	0.513	0.076
Births per month	71.286	143.826	200.036	226.903

	Black Patients		*White Patients*	
Panel C: Emergency Department Data	Mean	St. Dev.	Mean	St. Dev.
Chest pain visits per day	0.263	0.632	0.700	1.022
All visits per day	4.504	6.654	12.720	10.365
Female	0.502	0.337	0.485	0.238
Over 55 years old	0.247	0.288	0.333	0.220

Note: Hate crimes reported as totals at a county level (1991-2019). Natality Data reported at a county-by-month level and available for the entire contiguous United States (1991-2019). Emergency Department Data reported at a ZIP code-by-day level and restricted to California (2011-2019).

Table 3: Effect of Anti-Black Aggravated Assaults During Pregnancy on Birth Outcomes

	Birth weight (grams)	**Gestation length (weeks)**	**Low birth weight**	**Pre-term delivery**
	(1)	(2)	(3)	(4)
			Coefficient × 100	
Panel A: Black Mothers				
Anti-Black aggravated assaults	-1.280***	-0.005**	0.052***	0.076**
	(0.487)	(0.002)	(0.020)	(0.031)
Observations	43,222	43,222	43,222	43,222
Mean of Dependent Variable	3,130.446	38.377	11.202	15.268
Panel B: White Mothers				
Anti-Black aggravated assaults	-0.174	-0.001	-0.014**	0.013
	(0.179)	(0.001)	(0.006)	(0.013)
Observations	51,722	51,722	51,722	51,722
Mean of Dependent Variable	3,398.254	38.997	5.246	8.267

Note: Coefficients in columns 3-4 multiplied by 100 for ease of interpretation. "Anti-Black aggravated assaults" refer to the number of anti-Black aggravated assaults reported in the mother's county of residence during pregnancy. Robust standard errors clustered at the county level. All models are weighted using the number of births in a county and include controls for mother's marital status, age, education level, infant's biological sex, parity, total and Black population, crime level, and unemployment rate as well as county and month-by-year fixed effects. *** indicates significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Table 4: Effect of Trimester-Specific Exposure to Anti-Black Aggravated Assaults on Pre-Natal Care Utilization

	Number of prenatal visits	**Start care in 1st trimester**
	(1)	(2)
Panel A: Black Mothers		
1st trimester	-0.027	-0.003*
	(0.024)	(0.002)
2nd trimester	-0.000	0.000
	(0.020)	(0.001)
3rd trimester	0.005	0.0001
	(0.015)	(0.001)
Observations	43,110	43,110
Mean of Dependent Variable	10.430	0.648
Panel B: White Mothers		
1st trimester	0.021*	0.000
	(0.012)	(0.001)
2nd trimester	0.006	0.000
	(0.009)	(0.001)
3rd trimester	0.016	0.001
	(0.008)	(0.001)
Observations	51,718	51,718
Mean of Dependent Variable	11.817	0.822

Note: "1st trimester" refers to the effect of anti-Black aggravated assaults reported in the mother's county of residence during the first trimester of pregnancy; "2nd trimester" refers to the effect of anti-Black aggravated assaults reported in the mother's county of residence during the second trimester of pregnancy; "3rd trimester" refers to the effect of anti-Black aggravated assaults reported in the mother's county of residence during the third trimester of pregnancy. Robust standard errors clustered at the county level. All models are weighted using the number of births in a county and include controls for mother's marital status, age, education level, infant's biological sex, parity, total and Black population, crime level, and unemployment rate as well as county and month-by-year fixed effects. *** indicates significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Table 5: Effect of Trimester-Specific Exposure to Anti-Black Aggravated Assaults on Birth Outcomes

	Birth weight (grams)	**Gestation length (weeks)**	**Low birth weight**	**Pre-term delivery**
	(1)	(2)	(3)	(4)
			Coefficient × 100	
Panel A: Black Mothers				
1st trimester	-1.178	-0.008*	0.042	0.075
	(1.072)	(0.004)	(0.044)	(0.054)
2nd trimester	-1.701**	-0.013***	0.075**	0.121***
	(0.691)	(0.004)	(0.038)	(0.047)
3rd trimester	-1.055	0.003	0.044	0.043
	(0.686)	(0.003)	(0.028)	(0.038)
Observations	43,222	43,222	43,222	43,222
Mean of Dependent Variable	3,130.446	38.377	11.202	15.268
Panel B: White Mothers				
1st trimester	-0.197	-0.002	-0.006	-0.009
	(0.376)	(0.002)	(0.014)	(0.019)
2nd trimester	-0.390	-0.003*	-0.031**	0.034
	(0.315)	(0.002)	(0.013)	(0.023)
3rd trimester	0.009	0.001	-0.009	0.016
	(0.332)	(0.002)	(0.011)	(0.019)
Observations	51,722	51,722	51,722	51,722
Mean of Dependent Variable	3,398.254	38.997	5.246	8.267

Note: Coefficients in columns 3-4 multiplied by 100 for ease of interpretation. "1st trimester" refers to the effect of anti-Black aggravated assaults reported in the mother's county of residence during the first trimester of pregnancy; "2nd trimester" refers to the effect of anti-Black aggravated assaults reported in the mother's county of residence during the second trimester of pregnancy; "3rd trimester" refers to the effect of anti-Black aggravated assaults reported in the mother's county of residence during the third trimester of pregnancy. Robust standard errors clustered at the county level. All models are weighted using the number of births in a county and include controls for mother's marital status, age, education level, infant's biological sex, parity, total and Black population, crime level, and unemployment rate as well as county and month-by-year fixed effects. *** indicates significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Table 6: Effect of In Utero Anti-Black Aggravated Assaults on Birth Outcomes–Robustness to Alternative Parameterizations of Anti-Black Aggravated Assaults

	Birth weight (grams)			**Gestation length (weeks)**		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Black Mothers						
Anti-Black aggravated assaults	-24.542*	-2.035**	-1.513*	-0.093*	-0.007	-0.003
	(13.387)	(0.877)	(0.895)	(0.054)	(0.004)	(0.004)
Observations	43,222	43,222	43,222	43,222	43,222	43,222
Mean of Dependent Variable	3,130.446	3,130.446	3,130.446	38.377	38.377	38.377
Panel B: White Mothers						
Anti-Black aggravated assaults	-6.972*	-0.616	-0.794**	-0.029	-0.003	-0.000**
	(4.207)	(0.376)	(0.367)	(0.020)	(0.002)	(0.002)
Observations	51,722	51,722	51,722	51,722	51,722	51,722
Mean of Dependent Variable	3,398.254	3,398.254	3,398.254	38.997	38.997	38.997
Rate per 10,000	X	-	-	X	-	-
Log(Assault + 1)	-	X	-	-	X	-
Assault binary	-	-	X	-	-	X

Note: In Columns (1) and (4), anti-Black aggravated assaults are parameterized as a rate per 10,000 residents; in Columns (2) and (5), anti-Black aggravated assaults are log-transformed; in Columns (3) and (6), anti-Black aggravated assaults are parameterized as binary indicators equal to one when at least one anti-Black hate crime is reported in the mother's county of residence during pregnancy. Robust standard errors clustered at the county level. All models are weighted using the number of births in a county and include controls for mother's marital status, age, education level, infant's biological sex, parity, total and Black population, crime level, and unemployment rate as well as county and month-by-year fixed effects. *** indicates significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Table 7: Associations between In Utero Exposure to Anti-Black Aggravated Assaults and the Number of Births as well as Maternal Demographic Characteristics

	Total births	Mother's age	Married	Less than HS	College or more	First child	Male child
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Coefficient × 100				
Panel A: Black Mothers							
Anti-Black aggravated assaults	0.464	0.005	-0.149***	-0.059	0.021	0.044	0.002
	(0.506)	(0.006)	(0.051)	(0.058)	(0.042)	(0.044)	(0.030)
Observations	43,222	43,222	43,222	43,222	43,222	43,222	43,222
Mean of Dependent Variable	71.286	26.033	30.314	20.563	13.193	38.048	50.830
Panel B: White Mothers							
Anti-Black aggravated assaults	-0.240	-0.001	-0.189*	0.003	-0.133	-0.055**	0.006
	(0.558)	(0.004)	(0.102)	(0.022)	(0.125)	(0.028)	(0.016)
Observations	51,722	51,722	51,722	51,722	51,722	51,722	51,722
Mean of Dependent Variable	200.036	28.866	76.072	8.561	38.322	42.979	51.324

Note: Coefficients in columns 3-7 multiplied by 100 for ease of interpretation. Robust standard errors clustered at the county level. All models except for column (1) are weighted using the number of births in a county. All models include controls for total and Black population, unemployment rate as well as county and month-by-year fixed effects. *** indicates significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Table 8: Effects of Anti-Black Aggravated Assaults on the Number of Chest Pain-Related Emergency Department Visits on the Day of the Assault As Well As One, Two, and Three Days After the Assault

	Number of Chest Pain Related ED Visits	
	Black Patients	**White Patients**
	(1)	(2)
Visits on day of assault	0.114***	0.047
	(0.042)	(0.046)
Visits one day after assault	0.009	-0.039
	(0.061)	(0.060)
Visits two days after assault	-0.062	0.091
	(0.045)	(0.070)
Visits three days after assault	0.015	0.008
	(0.047)	(0.053)
Observations	18,181	25,637
Mean of Dep. Var.	0.263	0.700

Note: Robust standard errors clustered at the ZIP code level. Each column denotes a separate regression model. "Visits on day of assault" refers to the effect on the number of visits on the day when at least one anti-Black aggravated assault is reported in the patient's ZIP code of residence; "Visits one day after assault" refers to the effect on the number of visits one day after at least one anti-Black aggravated assault is reported in the patient's ZIP code of residence; "Visits two days after assault" refers to the effect on the number of visits two days after at least one anti-Black aggravated assault is reported in the patient's ZIP code of residence; "Visits three days after assault" refers to the effect on the number of visits three days after at least one anti-Black aggravated assault is reported in the patient's ZIP code of residence. Both models include controls for proportion of female patients, proportion of patients over 55 years old, and the total number of daily ED visits per ZIP code as well as the total and Black population in a ZIP code. Both models also include day-of-year and ZIP code fixed effects. *** indicates significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Table 9: Heterogeneity by Availability of Local Newspapers–Effects of Anti-Black Aggravated Assaults on the Number of Chest Pain-Related Emergency Department Visits

	Black Patients		**White Patients**	
	Local news available	**Local news unavailable**	**Local news available**	**Local news unavailable**
	(1)	(2)	(3)	(4)
Visits one day of assault	0.159**	-0.246	-0.029	0.235
	(0.054)	(0.328)	(0.065)	(0.209)
Visits one day after assault	0.056	0.416***	0.038	0.037
	(0.095)	(0.144)	(0.076)	(0.303)
Visits two days after assault	-0.108*	0.969*	0.005	0.085
	(0.063)	(0.484)	(0.082)	(0.331)
Visits three days after assault	0.062	0.357	-0.041	-0.492
	(0.093)	(0.632)	(0.070)	(0.286)
Observations	7,328	1,390	10,779	2,282
Mean of Dep. Var.	0.246	0.389	0.537	0.510

Note: Robust standard errors clustered at the ZIP code level. "Local news available" refers to ZIP codes with over one daily local newspaper. "Local news unavailable" refers to ZIP codes with no daily local newspapers. "Visits on day of assault" refers to the effect on the number of visits on the day when at least one anti-Black aggravated assault is reported in the patient's ZIP code of residence; "Visits one day after assault" refers to the effect on the number of visits one day after at least one anti-Black aggravated assault is reported in the patient's ZIP code of residence; "Visits two days after assault" refers to the effect on the number of visits two days after at least one anti-Black aggravated assault is reported in the patient's ZIP code of residence; "Visits three days after assault" refers to the effect on the number of visits three days after at least one anti-Black aggravated assault is reported in the patient's ZIP code of residence. Both models include controls for proportion of female patients, proportion of patients over 55 years old, and the total number of daily ED visits per ZIP code as well as the total and Black population in a ZIP code. Both models also include day-of-year and ZIP code fixed effects. *** indicates significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Table 10: Placebo Effects of Anti-Black Aggravated Assaults on the Number of Flu-Related Emergency Department Visits

	Number of Flu Related ED Visits	
	Black Patients	**White Patients**
	(1)	(2)
Visits on day of assault	-0.016*	-0.016
	(0.008)	(0.011)
Visits one day after assault	0.017	0.011
	(0.021)	(0.017)
Visits two days after assault	-0.011	0.003
	(0.011)	(0.019)
Visits three days after assault	0.009	-0.011
	(0.013)	(0.015)
Observations	18,181	25,637
Mean of Dep. Var.	0.021	0.054

Note: Robust standard errors clustered at the ZIP code level. Each column denotes a separate regression model. "Visits on day of assault" refers to the effect on the number of visits on the day when at least one anti-Black aggravated assault is reported in the patient's ZIP code of residence; "Visits one day after assault" refers to the effect on the number of visits one day after at least one anti-Black aggravated assault is reported in the patient's ZIP code of residence; "Visits two days after assault" refers to the effect on the number of visits two days after at least one anti-Black aggravated assault is reported in the patient's ZIP code of residence; "Visits three days after assault" refers to the effect on the number of visits three days after at least one anti-Black aggravated assault is reported in the patient's ZIP code of residence. Both models include controls for proportion of female patients, proportion of patients over 55 years old, and the total number of daily ED visits per ZIP code as well as the total and Black population in a ZIP code. Both models also include day-of-year and ZIP code fixed effects. *** indicates significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

A Appendix

Table A1: ICD-9 and ICD-10 Diagnosis Codes for Chest Pain.

Description	**ICD-9 Code**	**ICD-10 Code**
Chest pain on breathing	R07.1	78652
Precordial pain	R07.2	78651
Other chest pain	R07.8	78659
Chest pain, unspecified	R07.9	78650

Source: Transition from ICD-9 to ICD-10 occured in 2015. Chest pain-related ICD-9 and ICD-10 codes taken from Aalam et al. (2020)