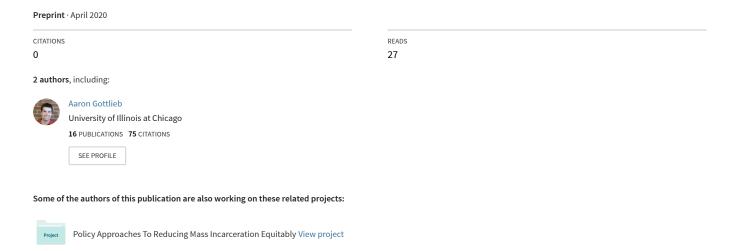
# Do Public Defender Resources Matter? The Effect of Public Defender and Support Staff Caseloads on the Incarceration of Felony Defendants



# Do Public Defender Resources Matter? The Effect of Public Defender and Support Staff Caseloads on the Incarceration of Felony Defendants

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#### **Abstract**

*Objective*: Although scholars have suggested that the lack of resources available to public defenders hinders case outcomes for defendants, this has rarely been studied empirically. One way lack of resources manifests is in high caseloads. In this study, we hypothesize that smaller public defender and support staff caseloads will be associated with lower levels of pretrial detention, the use of incarceration at final disposition, and the length of incarceration sentences.

*Method*: We link county level data on public defender and support staff caseloads from the 2007 Census of Public Defender Offices to individual level data on felony defendant sentencing outcomes in large urban counties from the 2006 and 2009 State Court Processing Statistics. The sample consists of more than 5,000 felony defendants in 11 large urban counties located in four states. To explore associations, we use multivariate statistical models with state-year fixed effects.

**Results:** The results suggest that felony defendants in counties with higher public defender and support staff caseloads are more likely to be detained pretrial and that felony defendants in counties with smaller support staff caseloads receive shorter incarceration sentences.

**Conclusions**: Efforts to reduce caseloads are an important potential area for criminal justice reform. These efforts should not only prioritize attorney caseloads, but also support staff caseloads.

# **Background**

While the U.S. incarceration rate has begun declining in recent years, it remains approximately four times higher than it was in the early 1970s (Bronson & Carson, 2019; National Research Council, 2014). Currently, the U.S. has the highest incarceration rate in the world and a far higher rate than other similar advanced democracies (Garland, 2001; Wacquant, 2009; Walmsley, 2018). For much of the last 40 years, there was strong support among policymakers on both sides of the political spectrum for punitive criminal justice policies (Beckett, 1997; Murakawa, 2014; Simon, 2007; Tonry, 2004). However, in recent years, policymakers have grown concerned about the financial costs of incarceration, the ineffectiveness of incarceration as a crime reduction tool, and the racial disparities in incarceration rates (Aviram, 2015; Gottschalk, 2015; Percival, 2015). As a result, policymakers have become increasingly interested in reducing the use of incarceration (Aviram, 2015; Gottschalk, 2015; Percival, 2015). Thus far, most efforts to reform the criminal justice system have focused on changing sentencing practices for nonviolent, nonserious, and nonsexual offenses (Gottschalk, 2015). While these reforms are important, policymakers must take additional steps to achieve significant reductions in incarceration (Pfaff, 2011; Raphael & Stoll, 2013).

One potentially promising area for reform is to increase the resources available to public defense (Alexander 2012; Fairfax 2013; Marcus 1994; Pfaff 2017). Since Gideon V. Wainright (1963), state and local governments have been required to provide attorneys to defendants who cannot afford one and are facing criminal charges. However, public defense systems have been

perpetually underfunded, which has hindered the quality of representation that public defenders are able to provide (Lefstein, 2011; Lefstein & Spangenberg, 2009; Peng, 2015; Pfaff, 2017; Taylor, 2011). Recent data suggests that only two percent of state and local spending on criminal justice goes towards public defense (Pfaff, 2017; Stevens et al., 2010). The underfunding of public defense systems often results in high attorney and support staff caseloads (in some instances public defenders do not even employ support staff, such as social workers and investigators). For example, in nearly 75 percent of county public defender offices, attorney caseloads exceed the recommended maximum, and only 60 percent employ investigators (Farole & Langton, 2010). This is particularly problematic because prosecutors tend to have far more resources than public defenders, which results in much lower caseloads (Perry & Banks, 2011; Pfaff, 2017).

A key assumption in the view that public defense reform is a potentially effective way to reduce incarceration is that public defenders with more resources, such as smaller attorney and support staff caseloads, produce more favorable outcomes for defendants. However, little research has examined the accuracy of this assumption (Iyengar, 2007). In this paper, we began to fill this gap by addressing four questions: 1) Do public defender caseloads impact the likelihood of pretrial detention? 2) Do support staff caseloads impact the likelihood of pretrial detention? 3) Do public defender caseloads impact whether and how long defendants are sentenced to incarceration? and 4) Do support staff caseloads impact whether and how long defendants are sentenced to incarceration? We found that, net of covariates, felony defendants in counties with higher public defender and support staff caseloads were more likely to experience pretrial detention and that felony defendants in counties with smaller support staff caseloads received shorter incarceration sentences.

#### **Literature Review**

Theory

The focal concerns perspective provides a useful theory for understanding why public defender and support staff caseloads may influence incarceration outcomes (Albonetti, 1991; Steffensmeier, 1980; Ulmer 2012). The focal concerns perspective argues that incarceration decisions made by judges and prosecutors are not based solely on the objective facts of the case (Kramer & Ulmer, 2009). Prosecutors and judges have time constraints, imperfect information, and biases that shape their decision-making (Crow & Adrion, 2011). As a result, legal and extralegal factors impact decisions made by judges and prosecutors by influencing perceptions of offenses and offenders along three focal dimensions: blameworthiness, the safety risk to the community, and practical constraints (Ulmer, 2012). In instances when information is incomplete, prosecutors and judges may rely on stereotypes, prejudice, and prior experiences to determine where an offender falls along the three focal dimensions (Hartley, 2014).

Based on the focal concerns perspective, we argue that public defender and support staff caseloads have the potential to impact incarceration outcomes if they impact the quality of the defense provided. Specifically, when public defenders and support staff have smaller caseloads, they are likely to be able to put forth a more thorough defense because they have more time to devote to each individual case (Lefstein & Spangenberg, 2009; Lefstein, 2011; Peng, 2015; Pfaff, 2017; Taylor, 2011). With more time, the focal concerns perspective suggests that public defenders and support staff will be able to gather higher quality information about cases and defendants and prepare arguments more effectively, presenting defendants as less blameworthy and less of a safety risk to the community. This, in turn, is likely to lead to more favorable pretrial and incarceration sentencing outcomes for defendants.

# Existing Empirical Research

There is a great deal of scholarship exploring the impact of public defense counsel on criminal case outcomes (Frederique, Joseph, & Hild, 2014). However, this research has tended to focus on only two questions: 1) Whether public defense counsel performs as well as privately retained attorneys and 2) Whether there are differences in performance among different types of public defenders (Frederique et al., 2014). Extant scholarship moving beyond type of attorney is quite limited, and only one study has tackled whether public defender caseloads impact case outcomes. Using data from three federal districts, Iyengar (2007) found that federal public defenders with lower caseloads tended to have more favorable case outcomes. Notably, this study only focused on the final case disposition and did not explore implications for pretrial incarceration.

There is also growing sentiment that public defense should take a more holistic approach (Frederique et al., 2014). From this perspective, understanding the legal issues surrounding the criminal case is only one important aspect of effective representation (Steinberg, 2006; Steinberg, 2013). To obtain positive case outcomes, a holistic approach also emphasizes gathering information about the broader context of defendants' lives and assisting clients with non-legal needs (Frederique et al., 2014; Lee, Ostrom, & Kleiman, 2015). As a result, holistic defense places greater importance on support staff (who are more likely to serve non-legal needs), such as social workers and investigators, than traditional approaches to public defense (Steinberg, 2013). Thus far, only one study has tested the effectiveness of holistic defense empirically. Using data from one county in South Carolina, researchers found mixed evidence as to whether criminal case outcomes improved after a holistic defense approach was incorporated (Dehart, Lize, Priester, and Bell 2017). This study, however, did not examine whether support

staff caseloads influenced case outcomes; it only examined the impact of the change in defense orientation.

This existing literature is limited in a number of ways. From a methodological standpoint, these studies are based on data that comes from one county or from a few districts in the federal system, so the conclusions that can be drawn for the United States criminal justice system as a whole are limited (DeHart et al., 2017; Iyengar, 2007). Substantively, the emphasis in this scholarship has largely been on attorneys and has yet to explicitly incorporate support staff and their caseloads (DeHart et al., 2016; Iyengar, 2007). This is an important oversight because attorneys often rely on support staff to provide broader context on defendants' lives and to assist clients with non-legal needs (i.e. securing substance abuse counseling or counseling to deal with trauma, preventing removal of children from the home or eviction from public housing, and securing employment), both of which are viewed as critical among advocates of holistic defense (Frederique et al., 2014; Lee, Ostrom, & Kleiman, 2015; Steinberg, 2006; Steinberg, 2013).

Lastly, the sole study that explored the impact of attorney caseloads only focused on final case disposition and did not examine pretrial outcomes (Iyengar, 2007).

# The Current Study

In the current study, we address each of the limitations above. From a methodological standpoint, we use data from a larger number of jurisdictions than prior work and from jurisdictions that are located in four states that vary substantially in their use of incarceration (Vera Institute, nd). Thus, our findings may be more generalizable to the country as a whole than previous work. From a substantive standpoint, we directly examine the impact of support staff caseloads on case outcomes. We also explore the impact of both attorney and support staff caseloads on incarceration outcomes, both pretrial and at sentencing. Based on the focal concerns

perspective and existing empirical scholarship, we hypothesize the following: 1) Felony defendants (represented by public defenders) charged in counties with small caseloads for public defenders will be less likely to be detained pretrial than defendants charged in counties with higher public defender caseloads, 2) Felony defendants (represented by public defenders) charged in counties with small caseloads for support staff will be less likely to be detained pretrial than defendants charged in counties with higher support staff caseloads, 3) Felony defendants (represented by public defenders) charged in counties with small caseloads for public defenders will less likely to be sentenced to incarceration and will receive shorter incarceration sentences than defendants charged in counties with higher public defender caseloads, and 4) Felony defendants (represented by public defenders) charged in counties with small caseloads for support staff will less likely to be sentenced to incarceration and will receive shorter incarceration sentences than defendants charged in counties with higher support staff caseloads

# **Data and Methods**

Data

To answer the key questions in this study, two types of data were needed: 1) Data on the number of cases, types of cases, and staffing of public defense offices; and 2) Data on individual characteristics (i.e. race, gender, criminal history, etc) and incarceration outcomes for defendants. Since there was no data source that contained both these features across a range of jurisdictions, we created a new dataset by linking data from the Census of Public Defender Offices (CPDO) to data from the State Court Processing Statistics (SCPS).

Data on public defender agencies came from the 2007 CPDO. The sampling universe were all public defender agencies funded primarily by state or local governments that provided representation for general criminal defense, capital cases, or conflict services (Farole & Langton,

2010). A questionnaire, designed by the Bureau of Justice Statistics (BJS), the National Legal Aid and Defender Association, a number of chief public defenders, and other public defense experts, was sent to more than 1,000 public defender offices, more than 97 percent of whom responded to at least some of the critical questions in the survey (Farole & Langton, 2010). For the purposes of this study, we limited the scope to public defender offices in states that rely on county based public defenders, since we cannot determine what percent of state resources go to a specific county in states with state-based public defender agencies. Although it would be ideal to have data from states with state-based offices, county-based offices handle nearly three-quarters of public defense cases (Farole & Langton, 2010). In counties with multiple public defender offices, we aggregated data to the county level so that we had county level measures of public defender and support staff caseloads.

Data on individual level characteristics and the incarceration outcomes were taken from the 2006 and 2009 SCPS. We focus on these two waves because they most closely correspond in time to data collected from the CPDO, in which 2007 fiscal year data captured a year-long period beginning as early as June 2006 and ending as late as June 2008 (depending on the agency). Each wave of the SCPS data were collected using a two-stage stratified sample (Cohen & Kyckelhahn, 2010; Reaves, 2013). In stage one, the 75 most populous counties were broken up into four stratum (Cohen & Kyckelhahn, 2010). The first stratum consists of 10 counties that are guaranteed for selection because they have a large number of court filings (Cohen & Kyckelhahn, 2010). The remaining 65 counties were placed into one of three strata in which selection was not guaranteed; which of the strata these counties were placed in was based on variation in court filings, arrest, and population data (Cohen & Kyckelhahn, 2010). From these

last three strata, 30 counties were selected (Cohen & Kyckelhahn, 2010). It is important to note that the SCPS only includes felony cases and does not capture less serious charges.

For each defendant, there was information indicating the county in which the case was filed, as well as the type of defense counsel (Cohen, 2014). As a result, we were able to drop all defendants from the sample who were not represented by public defenders and who had a case filed in a county in which we did not have public defender and support staff caseload data. Additionally, we restricted the sample to defendants in states that had multiple counties in a given year with data on public defender resources. In so doing, we were able to account for unobservable state policy differences in our analyses (Allison, 2005; Gottlieb, 2017; Halaby, 2004; National Research Council, 2014; Raphael & Stoll, 2013). This resulted in a sample including defendants from 11 counties (Maricopa, Pima, Los Angeles, San Bernardino, Ventura, New York, Nassau, Suffolk, Cuyahoga, Franklin, and Hamilton) in 4 states (Arizona, California, New York, and Ohio). For each county in the sample we had data on defendants for both 2006 and 2009, with the exception of Nassau County (for which defendant data was only available in 2006). In the case of New York City, some of the public defender agencies in the area served multiple boroughs; thus, we cannot accurately capture resources that each agency was providing to specific boroughs. As a result, we combined the different New York City boroughs with available data (Bronx County, Kings County, and New York County) into one county for our analyses. A key strength of the data is that the demographic characteristics of counties vary significantly, increasing the likelihood that the findings from this study are generalizable. For instance, the share of the county population that was White ranged from approximately 28 percent in Los Angeles County to 72% in Suffolk County, the share that was Black ranged from two percent in Ventura County to 29 percent in Cuyahoga County, and the share that was Latinx ranged from three percent in Hamilton County to 49 percent in San Bernardino County (U.S. Census, 2019).

For each analysis, we excluded defendants with missing data on the outcome of interest and used multiple imputation to fill in missing values on cases with missing information on control variables (Allison, 2002; Rubin, 1976). This resulted in final analytic samples of 5,601 defendants (out of a possible 5,658) for our analysis with pretrial detention as the outcome, 5,127 defendants (out of possible 5,628) for our analysis with incarceration sentence as the outcome, 5,072 defendants (out of a possible 5,628) for our analysis with incarceration sentence length for the full sample as the outcome, and 2,860 defendants (out of a possible 3,446) for our analysis with incarceration sentence length among those who were sentenced to incarceration as the outcome. The sample sizes in parantheses represent the number of observations we would have if there was no missing data on the outcome of interest. This suggests that the amount of data missing on outcome variables ranged from 1% to 17%. Failing to impute missing data on control variables would reduce sample sizes to 5,380, 4,922, 4,869, 2,750, making sample sizes 4% smaller in each instance.

By using multiple imputation, we assumed that data is missing at random (MAR). Although this assumption is untestable, it is weaker than the assumption (missing completely at random) made when using listwise deletion (Bhaskaran & Smith, 2014). However, as a robustness check, we re-ran all analyses using listwise deletion and found very similar results, bolstering confidence in the findings presented. Since this study relied solely on deidentified secondary data, it was determined to be exempt by IRB.

Measures

Individual Level Incarceration Outcome Measures

All four of the outcome measures were drawn from the 2006 and 2009 SCPS. The first outcome variable was measured dichotomously and captures whether felony defendants experienced pretrial detention (coded 1 if yes and 0 if no). The second outcome variable was also measured dichotomously and captures whether the final case disposition for felony defendants was a sentence of incarceration (code 1 if yes and 0 if no). The third outcome variable was measured continuously and captured the length of the incarceration sentence received during final case disposition. Because this measure had a skewed distribution, we log transformed this variable. As recommended by Cameron and Trivedi (2009), to keep respondents who were not sentenced to incarceration in our analysis, we treated them as having been sentenced to 0.001 months, a sentence shorter than any defendants who did receive a sentence of incarceration. The fourth dependent variable was identical to the third, except we excluded people who were not sentenced to incarceration. Therefore, it is a continuous log transformed measure capturing sentence length among those who were sentenced to incarceration.

# Caseload County Level Independent Variables

The two key independent variables were drawn from the CPDO. To capture public defender resources at the county level, we focused on caseloads for both attorneys and public defender support staff. To capture attorney caseloads, we divided the total number of cases handled by public defenders in a county by the total number of public defenders in the county. Higher values indicate more cases per attorney on average, and in turn, fewer resources. To capture support staff caseloads, we divided the total number of cases handled by public defenders in a county by the total number of support staff in the county. Individuals categorized as support staff include: investigators, social workers, paralegals, indigency screeners, administrative staff, clerical staff, training staff, interns, and others (Farole & Langton, 2010).

Higher values indicate more cases per support on average, and in turn, fewer resources. For both independent variables, we did not have access to information indicating the number of hours that part-time employees worked. For the purposes of our calculations, we treated two part-time workers as equivalent to one full-time worker.

# Caseload County Level Control Variables

The key independent variables which capture attorney and support staff caseloads did not account for the fact that different case types require different amounts of work. Therefore, using data from the CPDO we created a variable that measures the percent of public defender cases in a county that fell into the following categories: felonies, misdemeanors that carry a jail sentence, cases that did not carry the possibility of incarceration, appeals, and juvenile-related cases.

Although the defendant-level data only includes felony cases, by including these measures, we account for the fact that in some counties caseloads included other types of cases, which might require longer or shorter time commitments than traditional felony cases. Failure to account for this variation in caseload composition would potentially lead to misleading estimates of caseload effects.

#### Individual Level Control Variables

In addition to these county level control variables, we also included a number of control variables that captured individual level characteristics. To account for demographic characteristics, we controlled for gender (measured dichotomously), race (measured categorically as White, Black, Latinx, and Other), and age (measured continuously). We also included a number of control variables that account for criminal history including: most serious current arrest charge (measured categorically as violent, property, drug, or public order), most serious prior conviction (measured categorically as none, misdemeanor, or felony), whether the

defendants had an active criminal justice status at the time of the current arrest (measured dichotomously), the number of prior felony arrests (measured continuously) and the number of prior misdemeanor arrests (measured continuously). Because the SCPS uses unified definitions, these individual level factors should be measured in the same way across jurisdictions, although it is possible that there may be some variation in how definitions were interpreted by local actors. *Analytic Strategy* 

To assess the impact of public defender and support staff caseloads on incarceration outcomes, we used multiple regression for each analysis. This approach allowed us to be more confident that associations we observed were not spurious because we were able to control for observable factors that might have been associated both with public defender resources and felony case outcomes. In addition to observable characteristics, unobservable characteristics have the potential to contaminate estimates. To address this, we included state-year fixed effects. By including state-year fixed effects, our estimates were derived from differences in outcomes among defendants living in different counties within the same state during the same year. In so doing, we were able to statistically control for all state level policies in a given time period that may have impacted incarceration outcomes (Allison, 2005; Barker, 2006; Campbell & Schoenfeld, 2013; Gottlieb, 2017; Halaby, 2004). We included state-year fixed effects instead of county-year fixed effects because there is no variation in our measure of county-level public defender resources over time and within counties. However, we did adjust standard errors for the fact that observations within a county-year are likely correlated by including robust standard errors that are clustered by county-year.

In the first multivariate analysis, we examined the impact of public defender attorney and support staff caseloads on the likelihood of defendants experiencing pretrial detention. To do so,

we used logistic regression because our outcome measure is dichotomous (Long & Freese, 2001). In the second multivariate analysis, we examined the impact of public defender attorney and support staff caseloads on whether felony defendants' final case disposition is a sentence of incarceration. For this analysis, we also employed logistic regression, since the outcome is dichotomous (Long & Freese, 2001).

In the last multivariate analyses, we examined the impact of public defender attorney and support staff caseloads on the log of the sentence length that felony defendants received. For the first model, we used tobit models, as has often been done in research that explores sentence length as the outcome (Albonetti, 1997; Bushway, Johnson, & Slocum, 2007; Bushway & Piehl, 2001; Kurlychek, 2018; Kurlychek & Johnson, 2004; Kurlychek & Johnson, 2010). Tobit regression is a nonlinear model that assumes that all felony defendants have a positive probability of not being sentenced to incarceration, but that among those who are sentenced to incarceration, the length of the sentence is a continuous random variable (Bushway & Piehl, 2001; Gottlieb, Pilkauskas, & Garfinkel, 2014; Tobin, 1958). Since the sentence length variable was clustered around zero months and it is impossible to observe a sentence length of negative months, tobit regression allows us to include respondents who were not sentenced to incarceration in our analysis and avoid violating key model assumptions (Gottlieb et al., 2014; Jayakody, 1998; Jensen & Tienda, 1988; Kurlychek, 2018). In Model 2, as an alternative test, we employed OLS regression but restricted our analyses to respondents who were sentenced to incarceration. For ease of interpretation, we present exponentiated coefficients so that results can be interpreted in terms of percent change. All analyses were conducted in Stata 15.

#### **Results**

In Table 1, we present descriptive statistics for the sample. Nearly half the sample experienced pretrial detention. Approximately 57 percent of the defendants in the sample were sentenced to either jail or prison and the average sentence length was approximately 14 months (S.D.=53.71) for the full sample and 24 months (S.D.=69.68) among those who were sentenced to incarceration. Importantly for the multivariate results that follow, we found significant variation in public defender and support staff caseloads. Specifically, the average defendant resided in a county averaging 416 cases per attorney (S.D.=121.14), with a range of 101 to 657. The variation in caseloads per support staff was more substantial. The average defendant resided in a county averaging 691 cases per support staff (S.D.=258.37), with a range of 100 to 1269. Not surprisingly, a bivariate correlation analysis (not shown) demonstrates that public defender and support staff caseloads are significantly correlated (R=0.69). However, less than half of the variation (R2 =0.47) in public defender (support staff) caseloads is explained by support staff (public defender) caseloads, justifying the inclusion of separate variables.

### TABLE 1 ABOUT HERE

#### Multivariate Results

Table 2 presents associations of attorney and support staff caseloads with the likelihood of defendants being detained pretrial (net of covariates) using logistic regression. The results suggest that higher caseloads for attorneys were associated with a statistically significant increase in the likelihood of experiencing pretrial detention (p<0.01). Specifically, a 100 caseload increase per attorney was associated with 2.87 times higher odds of pretrial detention. The results from Table 2 also suggest that higher caseloads for support staff were associated with an increased odds of pretrial detention (p<0.01). Specifically, a 100 caseload increase per support staff was associated with 1.72 times higher odds of pretrial detention. Among control

variables, defendants charged with property, drug, and public order defenses (compared to violent offenses), defendants who had no active status at the time of their current arrest, defendants who were charged in counties with higher shares of misdemeanor cases that did not require jail time, and women were all less likely to be detained pretrial. Defendants whose most serious prior conviction was a felony (compared to no prior conviction), defendants with more prior felony and misdemeanor arrests, defendants who were charged in counties with higher shares of juvenile cases, and defendants who were Black or Latinx (compared to White) were more likely to be detained pretrial.

#### TABLE 2 ABOUT HERE

Table 3 presents associations of attorney caseloads and support staff caseloads (net of covariates) with the likelihood that the final case disposition for felony defendants is an incarceration sentence using logistic regression. The results suggest that attorney and support staff caseloads were not significantly associated with this outcome. Among control variables, defendants charged with drug offenses (compared to violent offenses), defendants who were charged in counties with higher shares of misdemeanor cases (both those that did and did not require jail time), and women were all less likely to be sentenced to incarceration. Defendants whose most serious prior conviction was a felony (compared to no prior conviction), defendants with more prior felony and misdemeanor arrests, and defendants who were Black or Latinx (compared to White) were more likely to be sentenced to incarceration.

#### TABLE 3 ABOUT HERE

Table 4 presents associations of attorney caseloads and support staff caseloads with incarceration sentence length. We present results as exponentiated coefficients so that the findings can be interpreted in terms of percent change. The results from tobit regression analyses

do not provide evidence that there was a significant association between attorney caseloads and the length of incarceration sentence for the full sample. The results do, however, suggest that support staff caseloads were associated with the length of incarceration sentence (p<0.05). Specifically, a 100 caseload increase per support staff was associated with an increase in sentence length of approximately 89 percent. Among the control variables, defendants charged with drug offenses (compared to violent offenses), defendants who had no active status at the time of their current arrest, defendants who were charged in counties with higher shares of misdemeanor cases (both those that did and did not require jail time), and women received shorter incarceration sentences. Defendants whose most serious prior conviction was a felony (compared to no prior conviction), defendants with more prior felony arrests, and defendants who were Black or Latinx (compared to White) received longer incarceration sentences.

The results from OLS regression restricted to those sentenced to incarceration suggests that both attorney and support staff caseloads were associated with incarceration sentence length. Specifically, a 100 caseload increase per attorney was associated with an increase in sentence length of approximately 90 percent (p<0.01) and a 100 caseload increase per support staff was associated with an increase in sentence length of approximately 14 percent (p<0.01). Among the control variables, defendants charged with drug, property, and public order offenses (compared to violent offenses), defendants who had no active status at the time of their current arrest, defendants with more prior misdemeanor arrests, older defendants, and women received shorter incarceration sentences. Defendants whose most serious prior conviction was a felony (compared to no prior conviction), defendants with more prior felony arrests, defendants who were charged in counties with a higher share of appeals cases, and defendants who were categorized as Other race (compared to White) received longer incarceration sentences.

#### TABLE 4 ABOUT HERE

#### Discussion

The field of social work has recognized the importance of reforming our criminal justice system, with The American Academy of Social Work & Social Welfare (AASWSW) naming Promote Smart Decarceration as one of social work's 12 Grand Challenges to be addressed in the following decade (Grand Challenges for Social Work, 2019). The Smart Decarceration Initiative (SDI) has identified three key aims that must be achieved for the United States to achieve effective and sustainable decarceration: 1) significantly reduce the number of people who are incarcerated; 2) Ameliorate existing disparities among those who are incarcerated; and 3) Enhance the well-being and safety of the public (Epperson & Pettus-Davis, 2015; Pettus-Davis & Epperson, 2015).

The results from this study have provided important insight into the first of these Smart Decarceration aims (reducing the number of people who are incarcerated) and take on the Smart Decarceration call for generating evidence on potentially promising reform practices (Epperson & Pettus-Davis, 2015; Pettus-Davis & Epperson, 2015). In particular, this study has provided evidence suggesting that keeping the caseloads of public defenders and public defender support staff manageable has the potential to lead to reductions in incarceration. The findings from this study are consistent with the work of Iyengar (2007), which (in a sample from a small number of federal districts) generally found that smaller public defender caseloads were associated with more favorable final case dispositions. The findings are also consistent with one of the key guiding principles of the SDI: the need to focus on criminal justice system-wide innovations, rather than purely sentencing reform (Epperson & Pettus-Davis, 2015; Pettus-Davis & Epperson, 2015). Specifically, the findings are consistent with the view that reforms to court systems are

potentially important for reducing incarceration (Epperson & Pettus-Davis, 2015; Pettus-Davis & Epperson, 2015).

Importantly, this study is the first to explore the impact of support staff caseloads and found that defendant outcomes become more favorable when support staff have smaller caseloads. While the data do not allow us to determine the mechanisms that explain this association, the findings are consistent with the argument that a holistic approach to defense is likely to improve outcomes for defendants (DeHart et al., 2017; Frederique et al., 2014; Lee, Ostrom, & Kleiman, 2015; Steinberg, 2013). In addition, our findings are also consistent with the possibility that support staff do different tasks than attorneys and may have certain unique skills (i.e. social workers may be better able to gain the trust of defendants, which may enable them to uncover mitigating factors) that allow them to obtain information about cases or defendants' circumstances that can lead to favorable outcomes for defendants.

In evaluating these findings, it is important to consider this study's limitations. One limitation is that the results are based on non-experimental data. Therefore, even though we include state-year fixed effects in our statistical models, we cannot rule out with certainty the possibility that the associations we observe are due to some unobserved factor that is associated with both public defender and support staff caseloads and incarceration outcomes. In particular, although our study design allows us to account for state level policies and practices, the design does not allow us to account for policy and practice differences at the county level, with the exception of caseload differences. To better address this limitation in future work, it would be helpful for studies to incorporate time-varying measures of public defender and support staff caseloads, so that county fixed effects can be included in statistical models.

A second limitation is that the results do not allow us to determine why caseloads matter. For support staff in particular, it would be helpful to know why caseloads have an impact because it may provide more insight into whether holistic defense models are effective and what specific actions taken by support staff lead to more favorable outcomes (DeHart et al., 2017; Frederique et al., 2014; Lee, Ostrom, & Kleiman, 2015; Steinberg, 2013). A third limitation is that our measure of support staff lumps together different types of support staff (i.e. social workers, investigators, paralegals, indigency screeners, etc). Because these types of support staff perform different functions and have different training, they are unlikely to impact incarceration outcomes in identical ways. Given the above limitations, we believe future research should attempt to determine the causal effect of attorney and support staff caseloads, explore pathways through which caseloads impact incarceration outcomes, and examine the impact of caseloads for different types of support staff separately.

A final limitation is that we are unable to account for prosecutor caseloads in our analyses. High public defender caseloads are likely to be especially detrimental when prosecutor caseloads are small (i.e. when there is a great inequality in resources between the defense and the prosecution). Given the above limitations, we believe future research should attempt to determine the causal effect of attorney and support staff caseloads, explore pathways through which caseloads impact incarceration outcomes, examine the impact of caseloads for different types of support staff separately, and examine the impact of inequality in resources available to public defenders and prosecutors.

Notwithstanding these limitations, we believe our results have important implications for reducing incarceration. Although most prior reform efforts have focused on sentencing, our results suggest that increasing resources available to public defenders is another promising area

for reform (Gottschalk, 2015; Pfaff, 2011; Raphael & Stoll, 2013). Moreover, our results provide some insight into how resources should be allocated. Our findings suggest that caseloads for support staff have a significant impact on incarceration outcomes. Thus, since support staff tend to earn smaller salaries than attorneys, increasing the number of support staff may be a cost-effective way to reduce incarceration and a potentially promising reform for social workers to advocate for as we move toward an era of Smart Decarceration. Lastly, although these results suggest that increasing public defender and support staff caseloads is a promising avenue for reform, they also make clear that it is not enough to end mass incarceration and the racial disparities that exist in the criminal justice system. To end mass incarceration and eliminate racial disparities in the criminal justice system, social workers should also advocate for crime prevention efforts, police reform, bail reform, prosecutorial reform, sentencing reform, and a reimagining of how we as a society punish violence.

#### References

- Albonetti, C. (1991). An integration of theories to explain judicial discretion. *Social Problems*, 38, 247-266.
- Albonetti C. (1997) Sentencing under federal sentencing guidelines: Effects of defendant characteristics, guilty pleas, and departures on sentencing outcomes for drug offenses 1991–1992. *Law and Society Review*, 31(4), 789–822.
- Alexander, M. A. (2012). *The new Jim Crow: Mass incarceration in the age of colorblindness*. New York, NY: The New Press.
- Allison, P. D. (2002). Missing data. Thousand Oaks, CA: Sage
- Allison, P. D. (2005). Fixed effects regression methods for longitudinal data using SAS. Cary, NC: SAS Institute.
- Aviram, H. (2015). Cheap on crime: Recession-era politics and the transformation of American punishment. Oakland, CA: University of California Press.
- Barker, V. (2006). The politics of punishing: Building a state governance theory of American imprisonment variation. *Punishment and Society*, 8(1), 5–32.
- Beckett, K. (1997). *Making crime pay: Law and order in contemporary American politics*. New York, NY: Oxford University Press.
- Bhaskaran K., & Smeeth L. (2014). What is the difference between missing completely at random and missing at random? *International Journal of Epidemiology*, 43, 1336-1339.
- Bronson, J., & Carson, E. A. (2019). Prisoners in 2017. Washington, DC: Bureau of Justice Statistics.
- Bushway, S., Johnson, B., & Slocum, L. A. (2007). Is the magic still there? The use of the

- Heckman two-step correction for selection bias in criminology. *Quantitative Criminology*, 23(2), 151-178.
- Bushway, S. D., & Piehl, A. M. (2001). Judging judicial discretion: Legal factors and racial discrimination in sentencing. *Law & Society Review*, 35, 733–764.
- Cameron, A. C., & Trivedi, P. K. (2009). *Microeconometrics using Stata*. College Station, TX: Stata Press.
- Campbell M. C., & Schoenfeld, H. C. (2013). The transformation of America's penal order:

  A historicized political sociology of punishment. *American Journal of Sociology*, 118(5), 1375–1423.
- Cohen, T. H. (2014). Who is better at defending criminals? Does type of defense attorney matter in terms of producing favorable case outcomes. *Criminal Justice Policy Review*, 25(1), 29-58.
- Cohen, T. H., & Kyckelhahn, T. (2010). Felony defendants in large urban counties, 2006.

  \*\*Bureau of Justice Statistics: Bulletin. Retrieved from:

  https://www.bjs.gov/index.cfm?ty=pbdetail&iid=2193
- Crow, M. S., & Adrion, B. (2011). Focal concerns and police use of force: Examining the actors associated with Taser use. *Police Quarterly*, 14(4), 366–387.
- DeHart, D., Lize, S., Priester, M. A., & Bell, B. A. (2017). Improving the efficacy of administrative data for evaluation of holistic defense. *Journal of Social Service Research*, 43(2), 169-180.
- Epperson, M.W., & Pettus-Davis, C. Smart Decarceration: Guiding concepts for an era of criminal justice transformation. Center for Social Development Working Paper No. 15-33.

- Fairfax, R. A. Jr. (2013). Searching for solutions to the indigent defense crisis in the broader criminal justice reform agenda. *The Yale Law Journal*, 122(8), 2316-2335.
- Farole, D.J., & Langton, L. (2010). County-based and local public defender offices, 2007.

  \*Bureau of Justice Statistics: Special Report. Retrieved from:

  https://www.bjs.gov/content/pub/pdf/clpdo07.pdf
- Frederique, N., Joseph, P., & Hild, R. C. C. (2014). What is the state of empirical research on indigent defense nationwide? A brief overview and suggestions for future research. *A Albany Law Review*, 78(3), 1317-1340.
- Garland, D. (2001). *The culture of control: Crime and social order in contemporary society*. Chicago, IL: University of Chicago Press.
- Gideon v. Wainwright (372 U.S. 335 (1963))
- Gottlieb, A. (2017). Incarceration and relative poverty in cross-national perspective: The moderating roles of female employment and the welfare state. *Social Service Review*, 91(2), 293–318.
- Gottlieb, A., Pilkauskas, N., & Garfinkel, I. (2014). Private financial transfers, family income, and the Great Recession. *Journal of Marriage and Family*, 76, 1011–1024.
- Gottschalk, M. (2015). Caught: The prison state and the lockdown of American politics.

  Princeton, NJ: Princeton University Press.
- Grand Challenges for Social Work. (2019). Retrieved from https://grandchallengesforsocialwork.org/.
- Halaby, C. N. (2004). Panel models in sociological research: Theory into practice. *Annual Review of Sociology*, 30, 507–544.
- Hartley, R.D. (2014). Focal concerns theory. The Encyclopedia of Theoretical Criminology, First

- Edition. Edited by J. Mitchell Miller. Wiley-Blackwell Publishing.
- Iyengar, R. (2007). An analysis of the performance of federal indigent defense counsel.

  \*NBER Working Paper 13187.
- Jayakody, R. (1998). Race differences in intergenerational financial assistance: The needs of children and the resources of parents. *Journal of Family Issues*, 19, 508–533.
- Jensen, L., & Tienda, M. (1988). Nativity differentials in public assistance receipt: A research note. *Sociological Inquiry*, 58, 306–321.
- Kramer, J. H., & Ulmer, J. T. (2009). Sentencing guidelines: Lessons from Pennsylvania.

  Boulder, CO: Lynne Rienner.
- Kurlychek, M. C. (2018). Mitigation for minors: Exploring the nuances of social constructs and legal status in structuring sentences for youthful offenders. *Punishment and Society*, 20(4), 498-522.
- Kurlychek, M. C., & Johnson, B. D. (2004). The juvenile penalty: A comparison of juvenile and young adult sentencing outcomes in adult criminal court. *Criminology*, 42(2), 485–517.
- Kurlychek, M. C., & Johnson, B. D. (2010) Juvenility and punishment: Sentencing juveniles in adult criminal courts. *Criminology*, 48(3), 725–758.
- Lee, C. G., Ostrom, B. J., & Kleiman, M. (2015). The measure of good lawyering: Evaluating holistic defense in practice. *Albany Law Review*, 78, 1215–1238.
- Lefstein, N. (2011). Securing reasonable caseloads: Ethics and law in public defense. American Bar Association. Retrieved from: http://www.americanbar.org/content
- Leftstein, N., & Spangenberg, R. L. (2009). *Justice denied: America's continuing neglect of our constitutional right to counsel*. The Constitution Project. Retrieved from: http://www.constitutionproject.org/wp-content/uploads/2012/10/139.pdf

- Long, J. S., & Freese, J. (2001). Regression models for categorical dependent variables using Stata. College Station, TX: Stata Press.
- Marcus, R. (1994). Racism in our courts: The underfunding of public defenders and its disproportionate impact on racial minorities. *Hastings Constitutional Law Quarterly*, 22, 219-267.
- Murukawa, N. (2014). *The first civil right: How liberals built prison America*. New York, NY: Oxford University Press.
- National Research Council. (2014). *The growth of incarceration in the United States: Exploring causes and consequences*. Washington, DC: The National Academies Press.
- Peng, T. (2015, September 3). I'm a public defender. It's impossible for me to do a good job representing my clients. *The Washington Post*.
- Percival, G. R. (2015). Smart on crime: The struggle to build a better American penal system.

  Boca Raton, FL: CRC Press.
- Perry, S. W., & Banks, D. (2011). Prosecutors in state courts, 2007 statistical tables. *Bureau of Justice Statistics*. Retrieved from: https://www.bjs.gov/content/pub/pdf/psc07st.pdf
- Pettus-Davis, C., & Epperson, M. W. (2015). From mass incarceration to smart decarceration.

  (Grand Challenges for Social Work Initiative Working Paper No. 4). Cleveland, OH:

  American Academy of Social Work and Social Welfare
- Pfaff, J. F. (2011). The micro and macro causes of prison growth. *Georgia State University Law Review*, 28, 1239-1274.
- Pfaff, J. (2017). Locked in: The true causes of mass incarceration and how to achieve real reform. New York, NY: Basic Books.
- Raphael, S., & Stoll, M. A. (2013). Why are so many Americans in Prison? New York, NY:

- Russell Sage Foundation.
- Reaves, B. A. (2013). Felony defendants in large urban counties, 2009-Statistical tables.

  \*Bureau of Justice Statistics.\* Retrieved from:

  https://www.bjs.gov/content/pub/pdf/fdluc09.pdf
- Rubin, D. (1976). Inference and missing data. *Biometrika*, 63, 581–592.
- Simon, J. (2007). Governing through crime: How the war on crime transformed American democracy and created a culture of fear. New York, NY: Oxford University Press.
- Steffensmeier, D. (1980). Assessing the impact of the women's movement on sex-based differences in the handling of adult criminal defendants. *Crime and Delinquency*, 26, 344-357.
- Steinberg, R. G. (2006). Beyond lawyering: How holistic representation makes for good policy, better lawyers, and more satisfied clients. *New York University Review of Law and Social Change*, *30*, 625–634.
- Steinberg, R. G. (2013). Heeding Gideon's call in the twenty-first century: Holistic defense and the new public defense paradigm. *Washington and Lee Law Review*, 70(2), 962-1018.
- Stevens, H. R., Sheppard, C. E., Spangenberg, R., Wickman, A., & Gould, J. B. (2010). State, county and local expenditures for indigent defense services fiscal year 2008. *American Bar Association*. Retrieved from: https://www.americanbar.org
- Taylor, K. (2011). *System overload: The costs of under-resourcing public defense*. Justice Policy Institute. Retrieved from: http://www.justicepolicy.org/uploads
- Tobin, J. (1958). Estimation of relationships for limited dependent variables. *Econometrica*, 26, 24–36.
- Tonry, M. (2004). Thinking about crime: Sense and sensibility in American penal culture. New York, NY: Oxford University Press.

- Ulmer, J. T. (2012). Recent developments and new directions in sentencing research. *Justice Quarterly*, 29(1), 1-40.
- U.S. Census. (2019). Annual estimates of the resident population by sex, race, and Hispanic origin for the United States, states, and counties: April 1, 2010 to July 1, 2018. Retrieved from: https://www.census.gov.
- Vera Institute of Justice. (n.d.). Incarceration trends [Searchable database]. Retrieved from: https://www.vera.org/projects/incarceration-trends
- Wacquant, L. (2009). *Punishing the poor: The neoliberal government of social insecurity*. Durham, NC: Duke University Press.
- Walmsley, R. (2018). *World prison population list* (12th ed.). London, UK: Institute for Criminal Policy Research. Retrieved from:

  http://www.prisonstudies.org/sites/default/files/resources/downloads/wppl\_12.pdf

Tables

Table 1: Descriptive Statistics for the Sample

	Mean/%	
Pretrial Detention	49.97	
Incarcerated Disposition	56.86	
Sentence Length Full Sample (Months)	13.80 (53.71)	
Sentence Length Incarcerated Sample (Months)	24.46 (69.68)	
Cases Per Attorney	416.35 (121.14)	
Cases Per Support Staff	690.80 (258.37)	
Felony Case %	25.75 (17.12)	
Misdemeanor Jail %	51.52 (22.99)	
Misdemeanor No jail %	10.40 (8.75)	
Appeals Case %	0.54 (0.78)	
Juvenile Case %	11.80 (11.50)	
Most Serious Arrest Charge-Violent	23.99	
Most Serious Arrest Charge-Property	29.46	
Most Serious Arrest Charge-Drug	34.70	
Most Serious Arrest Charge-Public Order	11.85	
Most Serious Prior Conviction-None	31.86	
Most Serious Prior Conviction-Misdemeanor	20.07	
Most Serious Prior Conviction-Felony	48.07	
# of Prior Felony Arrests	4.16 (3.93)	
# of Prior Misdemeanor Arrests	4.53 (3.99)	
No Active Status at Time of Arrest	64.61	
Female	16.14	
White	23.08	
Black	39.52	
Latinx	35.80	
Other Race	1.61	

Age	32.04 (11.21)
AZ	15.80
CA	43.5
NY	25.24
ОН	15.46
2006	50.46
2009	49.54

Note: Descriptive statistics based on non-imputed data. Standard deviation for continuous variables in parentheses

Table 2: Logistic Regression Estimates of the Effect of Public Defender and Support Staff
Caseloads on Pretrial Detention

	Odds Ratio	T-Statistic	
County Level Measures			
Cases Per Attorney (x100)	2.87 [1.87, 4.40]	4.83**	
Cases Per Support Staff (x100)	1.72 [1.48, 2.00]	7.10**	
PD Case Type % (% Felony=Ref)			
Appeals Case %	0.52 [0.25, 1.09]	-1.72	
Misdemeanor Jail Case %	0.98 [0.94, 1.03]	-0.66	
Misdemeanor No Jail Case %	0.91 [0.88, 0.94]	-5.57**	
Juvenile Case %	1.08 [1.04, 1.11]	4.52**	
Individual Level Measures			
Most Serious Arrest Charge (Violent=Ref)			
Property	0.56 [0.41, 0.78]	-3.50**	
Drug	0.39 [0.24, 0.64]	-3.77**	
Public Order	0.60 [0.44, 0.81]	-3.27**	
<b>Most Serious Prior Conviction (None=Ref)</b>			
Misdemeanor	0.94 [0.70, 1.26]	-0.41	
Felony	1.65 [1.26, 2.14]	3.69**	
# of Prior Felony Arrests	1.08 [1.04, 1.12]	3.80**	
# of Prior Misdemeanor Arrests	1.04 [1.01, 1.07]	2.55*	
No Active Status at Time of Arrest	0.51 [0.39, 0.66]	-5.00**	
Female	0.62 [0.52, 0.73]	-5.58**	
Race (White=Ref)			
Black	1.39 [1.13, 1.72]	3.06**	
Latinx	1.43 [1.10, 1.85]	2.70**	
Other	0.98 [0.59, 1.64]	-0.07	
Age	1.00 [1.00, 1.00]	0.07	

Notes: 95% confidence intervals based on robust standard errors clustered by county-year in brackets. State-year fixed effects are included in model but suppressed from table. \* p<0.05, \*\*p<0.01. N=5,601.

Table 3: Logistic Regression Estimates of the Effect of Public Defender and Support Staff Caseloads on Incarceration Disposition

	Odds Ratio	T-Statistic
County Level Measures		
Cases Per Attorney (x100)	1.15 [0.56, 2.38]	0.39
Cases Per Support Staff (x100)	1.09 [0.89, 1.33]	0.85
PD Case Type % (% Felony=Ref)		
Appeals Case %	0.98 [0.22, 4.47]	-0.02
Misdemeanor Jail Case %	0.83 [0.74, 0.93]	-3.25**
Misdemeanor No Jail Case %	0.83 [0.74, 0.92]	-3.34**
Juvenile Case %	0.98 [0.93, 1.03]	-0.95
Individual Level Measures		
Most Serious Arrest Charge (Violent=Ref)		
Property	0.97 [0.71, 1.32]	-0.21
Drug	0.49 [0.33, 0.71]	-3.69**
Public Order	0.96 [0.67, 1.39]	-0.2
<b>Most Serious Prior Conviction (None=Ref)</b>		
Misdemeanor	1.32 [0.99, 1.78]	1.86
Felony	1.92 [1.39, 2.65]	3.99**
# of Prior Felony Arrests	1.04 [1.01, 1.08]	2.27*
# of Prior Misdemeanor Arrests	1.04 [1.01, 1.08]	2.27*
No Active Status at Time of Arrest	0.87 [0.72, 1.05]	-1.47
Female	0.72 [0.61, 0.86]	-3.66**
Race (White=Ref)		
Black	1.26 [1.05, 1.51]	2.43*
Latinx	1.44 [1.32, 1.57]	8.08**
Other	1.42 [0.86, 2.34]	1.36
Age	0.99 [0.98, 1.00]	-1.11

Notes: 95% confidence intervals based on robust standard errors clustered by county-year in brackets. State-year fixed effects are included in model but suppressed from table. \* p<0.05, \*\*p<0.01. N=5,127.

**Table 4: Regression Estimates of the Effect of Public Defender and Support Staff Caseloads on Incarceration Sentence Length** 

	Tobit	T-Stat.	OLS	T-Stat.
County Level Measures				
Cases Per Attorney (x100)	7.86 [0.57, 109.01]	1.54	1.90 [1.19, 3.02]	2.90**
Cases Per Support Staff (x100)	1.89 [1.06, 3.37]	2.17*	1.14 [1.05, 1.24)	3.27**
PD Case Type % (% Felony=Ref)				
Appeals Case %	13.44 [0.05, 3433.82]	0.92	3.58 [1.48, 8.66]	3.03**
Misdemeanor Jail Case %	0.59 [0.40, 0.87]	-2.66**	1.03 [0.97, 1.09]	1.01
Misdemeanor No Jail Case %	0.57 [0.38, 0.85]	-2.76**	1.02 [0.95, 1.08]	0.5
Juvenile Case %	0.99 [0.85, 1.16]	-0.13	1.02 [0.99, 1.04]	1.42
Individual Level Measures				
Most Serious Arrest Charge (Violent=Ref)				
Property	0.45 [0.19, 1.08]	-1.79	0.41 [0.29, 0.59]	-5.19**
Drug	0.05 [0.02, 0.14]	-5.51**	0.40 [0.27, 0.59]	-4.99**
Public Order	0.47 [0.16, 1.35]	-1.41	0.45 [0.33, 0.61]	-5.58**
<b>Most Serious Prior Conviction (None=Ref)</b>				
Misdemeanor	2.60 [0.73, 9.23]	1.48	0.87 [0.67, 1.12)	-1.19
Felony	12.86 [2.95, 56.10]	3.40**	1.56 [1.14, 2.13)	2.99**
# of Prior Felony Arrests	1.23 [1.09, 1.39]	3.30**	1.11 [1.07, 1.15]	5.65**
# of Prior Misdemeanor Arrests	1.12 [1.00, 1.25]	1.94	0.98 [0.95, 1.00]	-2.19*
No Active Status at Time of Arrest	0.50 [0.26, 0.96]	-2.08*	0.71 [0.58, 0.87]	-3.57**
Female	0.23 [0.10, 0.52]	-3.56**	0.63 [0.55, 0.70]	-8.20**
Race (White=Ref)				
Black	2.10 [1.10, 4.02]	2.25*	0.99 [0.86, 1.15]	-0.15
Latinx	3.61 [2.10, 6.21]	4.63**	1.11 [0.93, 1.34]	1.22
Other	4.09 [0.63, 26.51]	1.48	1.52 [1.07, 2.15]	2.51*
Age	0.98 [0.95, 1.00]	-1.74	0.99 [0.99, 1.00]	-2.37*
Sample Size	5072		2860	

Notes: 95% confidence intervals based on robust standard errors clustered by county-year in brackets. State-year fixed effects are included in model but suppressed from table. \* p<0.05, \*\*p<0.01.