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Abstract

Although the penal system and public assistance programs play significant roles in the lives of disadvantaged populations in the United States, the relationship between the two institutions is not well understood. This is particularly true of publicly financed health care coverage. In this article, the authors study how state-level incarceration rates shape the provision of publicly financed health care and health insurance (Medicaid), using two theoretical frameworks as a guide: a collateral consequences model and a punitive regime model. The authors use state-level panel data to estimate how the size of the incarcerated population is related to Medicaid enrollments across states and within them over time. These analyses suggest that incarceration rates do have a substantial and positive effect on Medicaid rates within states over time. Across states, the relationship is less clear. On average, states with higher incarceration rates had somewhat fewer Medicaid enrollments until the early 1990s. After this point, Medicaid enrollments began to increase with the size of the incarcerated population. These findings suggest that though states' efforts to control crime and poverty may be linked, whereby states that use incarceration liberally are also stingy with Medicaid, the collateral consequences of mass incarceration undermine these efforts by producing greater demands for social welfare services.

Keywords

corrections, crime policy, courts/law, sentencing

Introduction

The last 20 years have seen considerable changes in the relationship between the American state and socially and economically marginalized populations. In the 1990s, concerns about rising public assistance caseloads contributed to “welfare reform” that for the first time imposed time limits and work requirements on public assistance programs, and decoupled automatic Medicaid enrollment

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from participation in Temporary Aid for Needy Families (TANF), the program that replaced Aid for Families with Dependent Children (AFDC). Nonetheless, as many as one in five Americans receive health care or health insurance through public sector programs such as Medicaid and State Children's Health Insurance Program (SCHIP). Over the same period of time, the proportion of individuals serving time in U.S. jails and prisons skyrocketed (West & Sabol, 2009; Western, 2006), and the number of persons in the lower socioeconomic strata who can expect to live some portion of their lives behind bars continues to grow (Beckett & Western, 2001; Western, 2006; Western & Pettit, 2004).

Although the penal system and the welfare state play significant roles in the lives of disadvantaged populations in the United States, the relationship between these two social institutions is not well understood. Significant prior work on the subject has explored how the overlapping origins of the two institutions shape their roles as agents of social control (e.g., Garland, 1985) but typically does not incorporate empirical analyses of how they intersect as a result. On the other hand, empirical studies that do focus on incarceration and the welfare state have been criticized on methodological grounds, in particular for inattention to the potentially endogenous relationship between social spending and other measured outcomes such as unemployment (see Greenberg, 2001). What is more, cash public assistance is typically the primary measure of social welfare efforts for the poor, to the exclusion of additional measures that could help to more fully conceptualize welfare outcomes.

In this article, we address this gap in our understanding of the intersection between prisons and poor relief. Specifically, we use annual state-level data to examine whether and how incarceration rates relate to the demand for Medicaid, the federal–state program that provides publicly financed health care for the poor (particularly to low-income families with children and to low-income expectant mothers). Our focus on Medicaid reduces the potential problem of endogeneity because the program (a) provides in-kind services rather than cash (and is theoretically less likely than income subsidies to impact criminal behavior) and (b) is directed primarily at populations (primarily females and children) that differ demographically from those most likely to be imprisoned (adult males). At the same time, enrollments may be sensitive to incarceration rates to the extent that families become eligible for benefits in the absence of an incarcerated breadwinner's earnings.

We test two contrasting theoretical perspectives on the relationship between Medicaid and incarceration across states, and within them over time: (a) a *collateral consequences* perspective suggesting that high incarceration rates will divert greater numbers of families to Medicaid rolls and (b) a *punitive regime* perspective suggesting that states with high incarceration rates will also have low Medicaid rates, with both the result of an underlying punitive approach to governing socially marginalized populations. Our analyses contribute to growing literatures on both the political context of criminal punishments and the social consequences of mass incarceration.

The Changing Context of Incarceration and Medicaid

Mass Incarceration

Prior to the early 1970s, incarceration rates were fairly stable. For example, between 1950 and 1972, the incarceration rate hovered at around 100 prisoners per 100,000 population, with approximately 200,000 individuals incarcerated in prisons. Since the mid-1970s, the population of persons behind bars has grown substantially. By mid-2009, the imprisonment rate had increased to 504 per 100,000, with over 1.6 million individuals in federal or state prisons. Including people in jails, there were 2.3 million individuals behind bars, or a rate of 748 per 100,000 (West, 2010). In population-adjusted terms, the number of prisoners has grown more than sevenfold since 1972 and is far greater than the incarceration rates of Western European countries (Garland, 2001; Western, 2006).

Research on incarceration illustrates how social structural realities substantially shape punishment in the United States. On one hand, criminological strain theories (Agnew, 1992; Merton, 1938) predict that poverty and inequality provoke increases in crime rates to which the State responds by incarcerating more offenders. On the other hand, a number of scholars argue that punishment has a stronger link to structural conditions themselves than to crime rates. Among the first to point this out were Rusche and Kirchheimer (1939), who argued that the intensity of punishment increases with the size of the surplus labor population since harsher punishments are deemed necessary to deter crime among a growing number of marginalized members of society. Thus, the form and conditions of punishments for criminal offenders is a function of the labor market. More recent scholars argue that punishment is used to control populations perceived as dangerous to public safety and private property, or as a source of instability and unrest (e.g., Irwin, 1985; Melossi & Pavarini, 1981; Wacquant, 2001; for a review, see Western, Kleykamp, & Rosenfeld, 2006), illustrating how incarceration can be linked to social contexts other than crime or criminal justice policy.

Medicaid Enrollments

Medicaid originated in the Social Security Amendments of 1965 as a means-tested state/federal program to finance primary and acute health care for certain categories of low income and medically needy persons. Over four decades after its inception, Medicaid has become the major public source of health care coverage for low-income Americans. The program is the third largest source of health insurance in the United States, covering over 58 million needy persons in 2006 (Kaiser Family Foundation, 2010; National Alliance on Mental Illness [NAMI], 2003; U.S. Department of Health and Human Services, 2004).

Under Medicaid, the federal government matches states' spending for impoverished persons' health care and health insurance. Although the receipt of federal Medicaid matching funds requires that states provide coverage for some populations (such as low-income families with children, Supplemental Security Income (SSI) recipients, and infants born to Medicaid eligible pregnant women), eligibility for other groups of the "categorically needy" vary widely from state to state (U.S. Congress Ways and Means Committee "Green Book," 2004; see also Currie & Gruber, 1996). For example, in Maine, working parents in households with income up to 206% of the federal poverty level (FPL) are eligible for Medicaid, compared to 17% of FPL in Arkansas and 65% of FPL in the United States as a whole (Kaiser Family Foundation, 2010). Taken together, these factors have contributed to wide cross-state variation in the number of persons covered by Medicaid. For example, Medicaid in Massachusetts covered 41% of its nonelderly poor compared to 14% in Virginia (NAMI, 2003).

Medicaid enrollment rates, have also fluctuated over time. Eligibility for Medicaid was originally targeted toward very poor families with children, and children remain the majority of recipients (about 50% of all enrollees, with low-income mothers making up a large portion of the rest of the nonelderly, nondisabled adult recipients; Kaiser Family Foundation, 2005). Subsequent legislation has expanded eligibility by raising the income eligibility level, providing coverage to low-income pregnant women and increasing the age limit of children covered at higher-income levels (Bitler & Zadovny, 2000; Cromwell, Adamache, Khandker, & Ammering, 1997; Cutler & Gruber, 1996).¹ By 1996, one in five low-income women were covered by Medicaid at any given time, and half of all low-income single women with children were covered (Short, 1996). However, after the passage of the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA; but often referred to generally as welfare reform) in 1996 decoupled automatic enrollment in Medicaid from receipt of TANF, decreasing public assistance caseloads resulted in the loss of Medicaid coverage for some low-educated single mothers (Chavkin, Romero, & Wise, 2000; Kaestner & Kaushal, 2003).

Public health and social science researchers typically explain variations in Medicaid enrollment rates by looking at individual determinants of enrollment. Lin et al. (2003), for example, find that

Medicaid-eligible children who are younger, African American, and whose parents are unmarried, unemployed, and AFDC- or TANF-eligible are more likely than other eligible children to be enrolled in Medicaid. Another avenue of inquiry considers how institutional policy shifts—such as changes in federal and state rules and financial incentives—shape Medicaid enrollment rates (Chavkin et al., 2000; Cromwell et al., 1997; Kaestner & Kaushal, 2003; Kandula, Grogan, Rathouz, & Lauderdale, 2004; Kronebusch, 2004; Shore-Sheppard, 2000). Yet, these studies only look at policies directly related to Medicaid and public assistance, and largely neglect how other state and federal policies and initiatives may shape Medicaid enrollment rates either by affecting the population of eligible enrollees or redirecting money to or away from health care. Moreover, given the complexity of the Medicaid program, few studies directly compare pre- and post-welfare reform enrollments in a cross-state context (for an exception, see Cromwell et al., 1997).

The Criminal Justice System and the Welfare State

In addition to studying how social context shapes punishment, sociologists and criminologists consider ways in which punishment impacts larger structural conditions, and how this in turn shapes subsequent policy development. For example, Garland (1985) argues that modern penal practices developed as an adjunct to the emerging system of social welfare of the post-Victorian era, a primary purpose of which was the inculcation of norms appropriate to politically and economically modernizing societies. Forms of punishment and welfare were thus ideologically and institutionally compatible, and in tandem reinforced new norms of conduct that transformed populations from “masses” into “citizens.” Seen in this way, punishment and public social provision are complementary strategies within a broader campaign to placate and control citizens (see also McCorkel, 2004; Simon, 1993).

In practice, the implementation of criminal justice and social welfare policies produce externalities that further strengthen their institutional linkages. The works of Bruce Western, Katherine Beckett, and others demonstrate how in the United States, incarceration policies impact the conditions under which the state carries out its social welfare efforts and vice versa. Western and Beckett (1999) argue that the U.S. penal system constrains unemployment and relieves pressure on wages by removing a sizable portion of participants from the labor force. This may help explain why states with low levels of public assistance spending also tend to have high incarceration rates.² While Beckett and Western (2001) argue that the observed negative relationship between imprisonment and spending is indicative of a “policy regime” that is uniformly harsh on the poor, it may also be the case that marginal improvements in economic conditions also result in fewer demands for services (or reductions in the size of statutorily eligible populations).

Though prior research convincingly establishes a broad link between punishment and the welfare state, how incarceration impacts specific social welfare efforts is less well known. Much of the existing work presents a theoretical framework for understanding the link between welfare and punishment (e.g., Garland, 1985; Simon, 1993; Wacquant, 2001), but without situating it within the larger context of how social institutions reinforce one another more generally. Beckett’s and Western’s studies of AFDC and incarceration (cited above) are the most prominent among the few works that empirically examine incarceration and welfare. Nonetheless, one problem with generalizing from their analyses is that AFDC and incarceration are potentially endogenous, in that low social spending for the poor could drive up determinants of incarceration. Under these circumstances, modeling determinants of incarceration (such as crime rates) as covariates in regression analyses would violate the assumption that independent variables are uncorrelated with the error term and produce biased results.³

Our study addresses these theoretical and empirical gaps in two ways. First, we focus on Medicaid enrollments, rather than cash assistance as a measure of public assistance. Because Medicaid eligibility

is not a source of household income, its availability is theoretically less likely to impact incarceration through criminal behavior; as a result, our analysis may limit the potential problem of endogeneity, even if we cannot eliminate it entirely. Additionally, we consider how imprisonment shapes social welfare provision, rather than vice versa. This allows us to extend beyond analyses of what shapes incarceration, to a better understanding of how incarceration shapes other aspects of social life, instead.

Second, we theoretically ground our analyses among a number of recent studies that consider the relationship between specific welfare programs and “nonwelfare” policies, including immigration and trade policy (Castles 1996), characteristics of the tax system (Howard, 1997), the prevalence of employment-related pensions and health insurance (Hacker, 2002), home ownership rates (Conley & Gifford, 2006), and military personnel policies (Gifford, 2006). These studies inform our analyses by establishing how state action in one policy domain has the capacity to structure the social, economic, and political environments from which issues belonging to other policy domains arise (Gifford, 2006). Viewed from this institutional perspective, the ways in which societies identify and collectively respond to social welfare needs are intertwined with “nonwelfare” policies and institutions to the degree that the latter: (a) perform welfare state functions for defined groups of persons; (b) intervene in social or market processes; or (c) introduce status distinctions among different groups that make social welfare claims upon the state.

This institutional perspective suggests that because both the prison and the publicly financed health care are state interventions targeted at the most disadvantaged members of society, explicitly in the case of Medicaid, but de facto for prisons and jails as well (Western, 2006), incarceration may alter demand for Medicaid. Two theoretical models, a collateral consequences model and a punitive regime model, inform our hypotheses of how Medicaid and incarceration rates are related.

Collateral Consequences

A growing body of literature within criminology focuses on the broad effects of mass incarceration, and specifically how imprisonment hurts families, communities, and individuals who have not committed crimes or who have already served their sentences in full (e.g., Clear, 2007; Comfort, 2008; Hagan & Dinovitzer, 1999; Mauer & Chesney-Lind, 2002; Western, 2006). Incarceration affects not only individual inmates (or ex-inmates) and their families but entire communities as well. In his review of the literature on the consequences of incarceration, Clear (2007) details several negative externalities in communities from which many individuals have been removed and incarcerated. These include reduced marriage rates, financial hardship faced by dependent family members of the incarcerated (both during incarceration and after, given the difficulty of obtaining employment for ex-prisoners), reduced property values, lower levels of local economic activity, fewer mentors for youth in the community, and increased rates of public assistance.

A number of recent studies focus specifically on how incarceration affects inmates’ families (e.g., Girshick, 1996; Harris & Miller, 2003; Travis & Waul, 2003; for a review, see Comfort, 2008). In one, Donald Braman illustrates the many and varied ways that inmates’ partners, spouses, children, parents, and other family members suffer as a result of the incarceration (Braman, 2002, 2004). The suffering includes anxiety over the incarcerated loved one, strain on friendships and family networks, and financial difficulty (see also Comfort, 2008). The financial costs extend far beyond loss of the inmate’s potential income and can include loss of child care assistance, costs of collect calls from prison, travel to visit the inmate, lost time from work, and court and attorney fees. Braman also describes how high-community incarceration rates can influence dating and parenting; in areas with large numbers of men incarcerated, men are encouraged to partner with multiple women and women are encouraged to enter into relationships with men who may be already attached. As a result, high incarceration rates increase the rates of single female-headed households.

These effects are relevant to the current analysis because they illustrate the profound consequences of incarceration on the material support for families and on aggregate conditions within communities. The incarceration of a family member or partner often means that a breadwinner is removed from the family, leaving the rest of the family without a source of income and health care. In other families, incarceration means that a working parent may have to quit working (and lose health care) to assume the child care duties formerly held by the inmate; furthermore, spouses and partners may not be able to maintain their current employment, given the time required for court appearances and prison visits. Though it is impossible to ascertain exactly how common each scenario is, Travis, Cincotta, and Solomon (2003) report that in 2000, more than half of all incarcerated men had minor children; the majority worked either part-time or full-time in the month preceding their arrest and were the primary source of income for their families. While men make up the vast majority of prisoners, more than 65% of incarcerated women reported having minor children; 42% of these mothers relied on public assistance as a primary source of income prior to their arrest (Travis, Cincotta, & Solomon, 2003). Thus, for a large number of families, removal of a family member through incarceration results in financial strain that includes loss of income and—if their income comes with benefits—health care. As Clear (2007) and others have shown, problems like this become magnified as large numbers of families within communities suffer, and thus the collateral consequences are felt at the community level as well. By this collateral consequences model, mass incarceration directly results in increased reliance on public assistance, including publicly financed health care coverage.

This collateral consequences model predicts both a longitudinal and a cross-sectional effect of incarceration on Medicaid rates, as expressed in the following hypotheses:

Hypothesis 1: Over time, Medicaid enrollment rates will increase as the proportion of incarcerated persons becomes larger.

Hypothesis 2: States with high incarceration rates will have high Medicaid enrollment rates.

Punitive Regime

We also consider an alternative hypothesis that suggests that an underlying approach to governing socially marginalized populations shapes both Medicaid and criminal justice systems. Beckett and Western (2001) make this case by showing how AFDC rates and incarceration are negatively related (see above); they explain this relationship by suggesting that states with a punitive approach to governing social marginality will spend little on AFDC and incarcerate large numbers of people (see also Greenberg & West, 2001; Weiman, Stoll, & Bushway, 2007). Thus, an observed empirical relationship between social welfare spending and incarceration rates is, in theory, spurious, as the thesis implies that both are driven by this underlying regime: a punitive approach to governing the socially marginalized.

The punitive regime thesis descends theoretically from the prior research on the link between punishment and welfare (see Garland, 1985; Rusche & Kirchheimer, 1939). It is also supported by Simon's (2007) recent work on "Governing through Crime," since Simon understands State intervention across institutional spheres to be motivated by similar notions of risk and insecurity. He discusses how the logic of governing risk of criminal victimization through mass incarceration has also spurred political activity to govern risk in families, schools, and the workplace. This new political order prioritizes "personal responsibility, rather than collective risk spreading, and minimal protections against economic harm" (2007, p. 23). In recent work, Wacquant (2009) also stresses the link between mass incarceration and neoliberal economic policies as complementary aspects of governing social marginality. Though public health care and incarceration might be very different responses to socially marginal populations, they may both be responses to a common underlying

framework for governance; this framework is consistent with neoliberalism in Wacquant's (2009) analysis, and referred to as "governing through crime" in Simon's (2007).

Unlike the collateral consequences model, the punitive regime perspective implies a cross-sectional relationship rather than a longitudinal one (though this cross-sectional effect can change over time) since it predicts that punitiveness can account for time-stable differences between states, more so than changes over time. In contrast to Hypothesis 1, here we do not expect that incarceration rates at time t influence change in Medicaid enrollments at time $t + 1$ since both are theorized as effects of a state's underlying punitiveness. As stated in the following hypothesis:

Hypothesis 3: States with high incarceration rates will have low Medicaid enrollment rates.

Though these two models offer competing views of how incarceration and Medicaid are related to one another, it is important to note that they are not necessarily opposed to one another. For example, those who understand a punitive regime to be the *cause* of incarceration might also support a collateral consequences perspective of the *effects* of incarceration (e.g., Western, 2006). In the following analyses, we consider when and how each model is supported in an analysis of Medicaid enrollment.

Data

We test our hypotheses using state-level, annual data for the years 1979–2002 ($n = 1,131$). Our sample falls short of 1,200 cases (50 states by 24 years) due to two reasons: (a) missing data (Medicaid data for Arizona are unavailable until 1991, Medicaid data were not reported for any states in 1982, and data are missing for Montana and Utah in years 1995–1997) and (b) removal of two influential outliers, following an examination of Cook's distance scores.

Our dependent variable, Medicaid enrollment rate, is the number of Medicaid beneficiaries as a percentage of each state's population. Our primary independent variable, incarceration rate, is the number of people in each state in each year serving at least a 1-year prison sentence, per 100,000 population. We do not include jail populations because jail inmates are either incarcerated while their cases are pending (thus not yet convicted) or serving sentences less than 1 year. Their removal from the labor market may therefore be too brief for it to shape their dependents' health care circumstances.

We also include variables indicating whether two criminal justice policies were in effect in a given state: three strikes laws and determinate sentencing laws. Prior research is mixed on whether these policies have a direct effect on incarceration rates with a number of studies concluding that these laws have had smaller effects on incarceration rates than one might otherwise presume (see Austin, Clark, Hardyman, & Henry, 1999; Marvell & Moody, 1996; Sorensen & Stemen, 2002; Western, 2006; for a description of California as an exception, see Zimring, Hawkins, & Kamin, 2001). Rather than assuming that these policies have a direct causal role on prison populations, we consider them proxies of states' overall penal/welfare regimes. These variables allow us to test our third hypothesis that the harshness of states' regimes may have a spurious effect on incarceration rates and Medicaid enrollment.

We also include two indicators of political conservatism: state government political ideology and whether the state has a republican governor.⁴ The state government political ideology variable is in the form of a scale developed by Berry, Ringquist, Fording, and Hanson (1998) and ranges from 0 (most conservative) to 100 (most liberal); this scale takes into account both political ideology of individual members of the state legislature and the balance of power in each state house. Prior research finds similar variables to be important determinants of incarceration rates (e.g., Greenberg & West, 2001; Jacobs & Carmichael, 2001; Sorensen & Stemen, 2002; see also Barker, 2009); we include these variables here because political ideology may be another cause of both incarceration and Medicaid, and thus these measures help to identify whether any relationship between incarceration and Medicaid is due to a spurious effect of punitive regimes.

Table 1. Descriptive Statistics, Full Sample and by Decade ($N = 1,131$)

	Full Sample		1979–1989		1990–2002	
	M	SD	M	SD	M	SD
Medicaid rate (percentage)	10.61	4.57	7.74	2.70	12.80	4.50
Incarceration rate per 100,000	258.35	144.00	166.29	82.72	328.47	141.27
Unemployment rate	5.86	2.00	6.71	2.26	5.21	1.48
Population in 1,000s	5,104.72	5,503.49	4,757.51	5,008.48	5,369.18	5,842.53
Income per capita, 1996\$	21,915.06	4,264.98	19,403.83	3,263.10	23,827.81	3,935.12
Poverty rate	13.07	4.01	13.53	4.31	12.72	3.74
% Black	9.86	9.40	9.51	9.26	10.12	9.49
% <Age 5	7.34	0.97	7.68	1.10	7.09	0.76
% Age 5–17	19.38	1.71	20.07	1.72	18.85	1.51
Determinate sentencing law	0.20	0.40	0.18	0.39	0.22	0.41
Three-strikes law	0.16	0.37	0.00	0.00	0.30	0.46
Violent crime rate	4,74.14	245.33	439.07	228.87	500.85	254.11
Property crime rate	4,312.34	1,123.60	4,532.16	1,162.79	4,144.90	1,063.61
Government ideology scale	51.09	23.49	53.32	20.75	49.39	25.26
Republican Governor	0.44	0.50	0.34	0.47	0.52	0.50
State revenue per capita	3,104.16	1,636.92	2,223.82	1,287.30	3,774.69	1,555.80

To better isolate our variables of interest and test our hypotheses, we also include several variables to control for each state's annual recorded crime rates (violent crime rate and property crime rate). Though prior research is mixed on whether there is a significant link between crime rates and imprisonment (e.g., Greenberg & West, 2001; Western, 2006), the potential for such a link and the presumption of a link by policy makers makes crime rates important covariates in our analyses. Our models also include several demographic factors that may be related to Medicaid enrollment and/or incarceration rates: income per capita (adjusted to 1996 dollars), the percentage of persons below the poverty line (Western, 2006), the percentage of African Americans (see Greenberg & West, 2001; Sampson & Laub, 1993), the percentage of persons below age 5 and between ages 5 and 17, and the overall state population (in thousands). Finally, we include each state's annual revenues per capita. This variable is an important control since wealthier states may have greater flexibility in establishing generous Medicaid enrollment policies or may be able to incarcerate greater numbers of people. Table 1 lists descriptive statistics for all variables.

Much of our data were provided by Smith (2004), who used them to analyze political explanations of incarceration rates. Smith obtained data on crime⁵ and incarceration rates from the Bureau of Justice Statistics (*Sourcebook of Criminal Justice Statistics*), data on poverty and age demographics from the U.S. Census (*Statistical Abstract of the United States*), and data on racial demographics from the State Politics & Policy Quarterly data archive. His indicator of determinative sentencing law came from a prior publication (Marvell & Moody, 1996), as did his indicator of three-strikes laws (Clark, Austin, & Henry, 1997).⁶ In addition to adding variables on political ideology (described above), we added to his data Medicaid enrollment rates, which we obtained from the *Statistical Abstract of the U.S.*, and we appended his data with additional years, 1996–2002, using primarily the same data sources. Values of the dependent variable and all continuous and ratio independent variables are transformed by their natural log.

Method

All of our analyses are performed using Stata version SE11.2. To explore how prison rates are related to Medicaid enrollment, we estimate a series of mixed-effects linear regression models.

To account for the fact that our data resemble a nested structure, in that different years can be thought of as nested within states, we include a random intercept for state, which essentially allows each state to have its own model constant. Additionally, because we wish to consider both within-state and between-state effects of incarceration, we include random effects for the incarceration rate, using the centered version of the logged incarceration rate per 100,000. In addition to accommodating our research questions, this strategy is appropriate based on a statistically significant likelihood ratio test, which suggests that the random effects model fits the data better than a random intercept model (see Rabe-Hesketh & Skrondal, 2008).

We estimate five models. To begin, in Model 1, we exclude a number of independent variables that may be spuriously related to incarceration and Medicaid: three-strikes laws, determinate sentencing laws, the property crime rate, the violent crime rate, and both political conservativeness variables. We then include these in Model 2 to determine both how they relate to Medicaid rates and whether their inclusion in the model alters the observed effect of incarceration on Medicaid enrollments. The variables indicating political conservatism and harsh sentencing laws are particularly important here; if there is indeed a punitive regime that shapes both incarceration and Medicaid, then we would expect to see the effect of incarceration on Medicaid diminish when we introduce these variables.

In order to assess the relationship between incarceration and Medicaid over time, we do not control for annual fluctuation in our first two models. This choice represents an important trade-off. These first two models are important for our purposes because they allow us to understand the longitudinal nature of the relationship between incarceration and Medicaid; this is not possible once we control for annual fluctuations since this element is then factored out of the results. Yet, this analytical strategy also introduces the probability of omitted variable bias since the model does not account for how rates of Medicaid and incarceration shift over time. Thus, in our next series of models, Models 3 and 4, we build on Model 2 by adding variables to account for time. In Model 3, we include year as a fixed effect. In Model 4, we include year as a grand mean centered variable rather than a fixed effect; this alternate measure of year allows us to assess the average effect of year and eliminates the need to include a long series of dummy variables, as is done in the fixed-effects model. These two models assess the relationship between incarceration and Medicaid across states holding constant year-to-year variation that is consistent across states and also consider the average effect of time on Medicaid rates. Finally, in Model 5, we replicate Model 3 (with year fixed effects) while including the interaction of a dummy variable for each Year * Incarceration Rate (again using the centered version of its natural log). This model lets us consider how the predicted effect of the incarceration rate varies across each year.

Another issue that conceivably could complicate our analysis is the fact that some inmates may have received Medicaid before their incarceration, and thus high incarceration rates may lower Medicaid enrollments in a way that is not considered by our hypotheses. However, it is unlikely that this has a substantial effect on our models for two reasons. One is that Medicaid recipients tend to be women, particularly women with children, while prison inmates are overwhelmingly male adults, thus the two groups overlap little. Second, the scale of Medicaid enrollment is vastly greater than the scale of incarceration. In 2008, for example, 43.5 million adults were enrolled in Medicaid in the United States,⁷ compared to 1.6 million prison inmates (West & Sabol, 2009). To simulate this possibility, we adjusted our Medicaid enrollment rate to assume that 50% of each state's annual prison population would have been on Medicaid if not incarcerated, and we added these individuals to each state's annual Medicaid rate. These models (available on request) were not substantively different than the models we report, suggesting that any causal negative effect of Medicaid enrollees losing their eligibility due to incarceration is minimal and should not affect our interpretation of the results.⁸ As a result, we report the unadjusted Medicaid enrollment rates.

Results

We begin with a general overview of Medicaid enrollments and incarceration in the United States over the last three decades. Figure 1 documents the average annual incarceration rate and Medicaid enrollment rate relative to the 1979 rate to illustrate the growth in both Medicaid and incarceration. Over this period, mean state Medicaid rates grew by 214% compared to a 337% increase in incarceration rates. However, incarceration grew more consistently than Medicaid enrollments. By showing a positive relationship between the two trends, this preliminary result is consistent with a collateral consequences argument and contradicts a punitive regime thesis.

Table 2 shows the results of the five regression models predicting the natural log of state Medicaid rates. Models 1 and 2 support the collateral consequences model by finding a significant and positive relationship between incarceration and Medicaid rates over time (Hypothesis 1). In Model 1, a 1% increase in the number of incarcerated persons per 100,000 population increases the estimated Medicaid enrollment rate by 0.3%. While this may seem a small amount, the mean annualized growth rate of U.S. incarcerations per capita was about 5.6%. It would not be unrealistic therefore to observe a 1.7% increase in Medicaid enrollments corresponding to a 1 year increase in the incarcerated population. As an example of the predicted range of Medicaid rates, given the variation in incarcerations, a state with an incarceration rate equal to the overall mean of 221 prisoners per 100,000 population ($\ln = 5.4$) would have a predicted Medicaid rate of 9.17% of its residents. An increase of 10% above the mean would mean a predicted Medicaid rate of 9.46, on average, an increase of 0.29% of the state's population, or 17,400 additional recipients in a state of 6 million residents (the mean state population). Alternatively, one can conceptualize the relationship between incarceration and Medicaid by comparing states. A state with an incarceration rate as high as Louisiana's in 2002 (793.8 prisoners per 100,000 population, $\ln = 6.676$) would have a mean-adjusted predicted Medicaid rate of 13.96% of its population; with a 2002 incarceration rate as low as Maine's (140.7, $\ln = 4.946$), the mean-adjusted predicted Medicaid rate would be only 7.94%.

The Model 1 results for the random effect of incarceration is the standard deviation across states of the predicted effect of incarceration, thus it shows that the relationship between incarceration and Medicaid varies significantly across states. When we interpret this along with the fixed effect of incarceration rate, we see that on average, incarceration is positively related to Medicaid but with substantial variation across states. The significant random intercept indicates substantial variation in the prediction of Medicaid across states.

The observed association between incarceration and Medicaid rates changes little when adding variables related to crime rates, punishment policies, and political ideology. On average, a 1% increase in the incarceration rate increases the estimated Medicaid rate by 0.28%, even when taking into account these additional variables (in Model 2). This indicates that the positive relationship between incarceration and Medicaid is independent of harsh sentencing policies, crime rates, and conservative politics. The random effect of incarceration is similar in magnitude to that of Model 1.

Other variables in Models 1 and 2 perform generally as expected. Unemployment, state population, per capita income, poverty rate, proportion of the population between ages 5 and 17, state revenues, violent crime rates, and having a three-strikes law are each positively and significantly related to Medicaid enrollments. The proportion of the population under age 5 is negatively related to Medicaid enrollments. Though the conservativeness of the state legislature is not significantly related to Medicaid rates, having a Republican governor is associated with lower Medicaid rates.

Because they exclude time effects, Models 1 and 2 do not control for temporal variation in Medicaid enrollment. But as Figure 1 illustrates, incarceration and Medicaid rates may in fact be following a common trend over time, which could bias our results. Models 3 and 4 report the

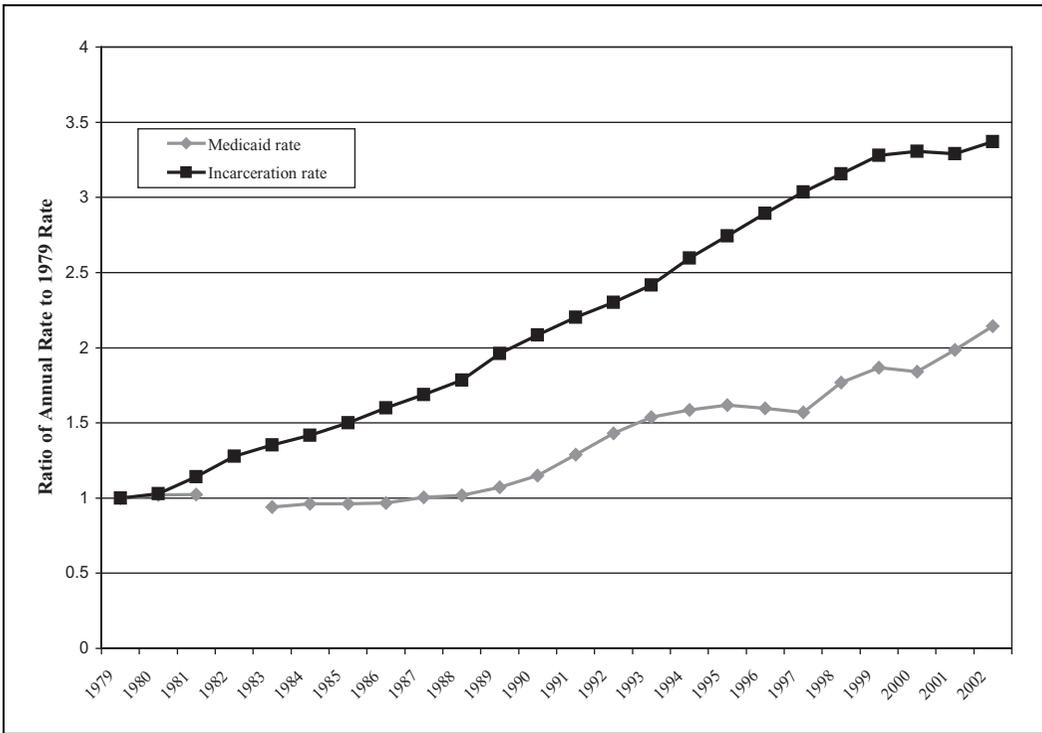


Figure 1. Annual average Medicaid and incarceration rates, normed to 1979 rate.

regression results across and within states over time by including first a measure of year fixed effects, and then year as a centered variable. Thus, Models 3 and 4 differ from Models 1 and 2 by considering variation across states, while factoring out the variation over time that is uniform across states.

Constraining the estimations within years results in a negative but nonsignificant relationship between states' incarceration and Medicaid rates in both Models 3 and 4. However, it is important to note that in Model 4, the coefficient for incarceration rate approaches significance ($p = .059$). The random effect of incarceration is again significant, suggesting that although the average relationship between incarceration and Medicaid is not statistically significant, this relationship varies significantly across states. The coefficient for year is positive and significant in Model 4, which indicates that Medicaid rates increased over our time series independently of changes in incarceration rates and the other measured variables. Once we control for variation over time, the only variables that are statistically significant in both models are per capita income, the percentage of the population under age 5, and having a Republican governor, each of which is negative, as well as poverty rate and having a three-strikes law, each of which is positive.

One potential problem with the analyses presented in Table 2 is that these models assume a constant relationship between incarceration rates on Medicaid rates over time. Yet, it is likely that any effect of incarceration rates vary across our time series, especially since the enormous increase in incarceration led to concentrated disadvantage in inner-city communities (see, e.g., Clear, 2007). To correct for this problem, we reestimated Model 3 adding an interaction term for year by the incarceration rate. This model, Model 5, performs much like Model 3, except that the negative coefficient for incarceration rate is statistically significant.

Table 2. Random Effects Regression of Medicaid Rate on Incarceration Rate

	Model 1	Model 2	Model 3	Model 4	Model 5
	Restricted Model	Full Model, No Year Variable	Full Model, Year FE	Full Model, Year Centered	Full Model, Year FE, Year Dummies * Incarceration
Incarceration rate	.326***	.277***	-.072	-.101	-.157*
Unemployment	.149***	.161***	.033	.052*	.049
Population	.218***	.206***	.100*	.067	.073
Per capita income	.669***	.809***	-.912***	-.628***	-.879***
Poverty rate	.136***	.129***	.070*	.085*	.057
% Black	-.072	-.130**	.008	-.006	.028
% Under Age 5	-1.705***	-1.657***	-.626***	-.711***	-.816***
% Age 5–17	.822***	.985***	-.031	.858***	-.056
State revenue	.098**	.095**	.074	-.059	.100*
Determinate sentencing law		.008	-.005	-.037	-.011
Three-strikes		.083***	.058**	.044*	.046*
Violent crime rate		.206***	.063	.176***	.037
Property crime rate		-.019	-.021	.016	-.026
Government ideology scale		.017	.011	.017	.014
Republican Governor		-.053***	-.048***	-.047***	-.048***
Year (Centered)				.060***	
Constant	-5.838**	-8.752***	10.867***	5.377**	11.330***
Random effect: Incarceration	.352***	.289***	.272***	.260***	.264***
Random intercept: State	.341***	.365***	.233***	.242***	.223***
Log likelihood	321.357	363.047	600.457	483.684	619.551

Note. Coefficients for year dummy variables and the interaction of year dummies *incarceration are not shown here. * $p < 0.05$. ** $p < .01$. *** $p < .001$.

Rather than listing all of the interaction term coefficients from Model 5, we illustrate the fluctuation in the relationship between incarceration and Medicaid rates across our time series. Figure 2 shows the marginal effect of incarceration rates on Medicaid enrollments in each year (i.e., the sum of the coefficient for incarceration and the coefficient for each Year * Incarceration interaction term). Asterisks here denote whether each interaction term is significantly different from zero—that is, the relationship between incarceration and Medicaid in a given year is significantly different from the relationship observed in 1979. The marginal effect is negative early in the time series, but then follows an upward trend where it eventually becomes positive most years after 1992 (all but 1997–1998). Thus, Figure 2 illustrates that though incarceration rates tend to have a negative relationship with Medicaid rates, the relationship between the two phenomena is complex, whereby the marginal effect is positive in more recent years, during the era of mass incarceration.

With regard to our test of the punitive regime theses, these results are somewhat supportive. Once we control for year, we see a negative relationship between incarceration and Medicaid, yet this coefficient is only significant at $p < .05$ in one of the three models. Additionally, in Figure 2, we see from the marginal effects that for most years, states that incarcerate many individuals also insure relative fewer low-income persons via Medicaid. This observed negative relationship between incarceration and Medicaid gives support (although not very strong support) to the punitive regime thesis, and contradicts Hypothesis 2, which suggests that the collateral consequences of mass incarceration will be felt contemporaneously, not just longitudinally.

The figure provides stronger support for the collateral consequences thesis (Hypothesis 1) by suggesting that growing incarceration rates mitigate the effect of punitive regimes by placing increasing

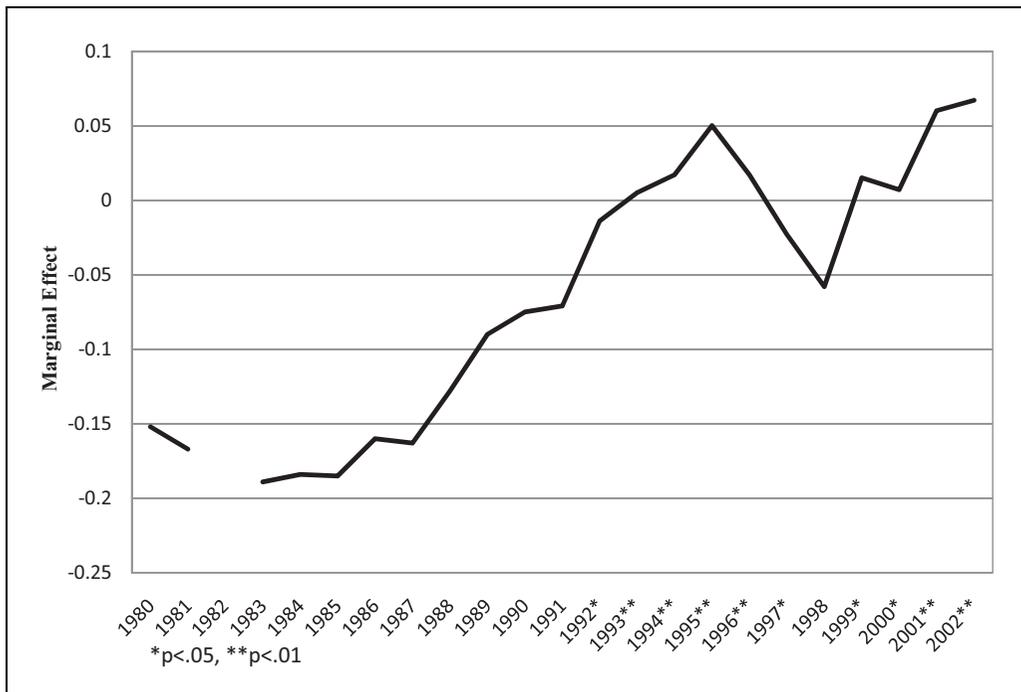


Figure 2. Marginal effect of logged incarceration rate on estimate of logged Medicaid rate, by year.

demands on the publicly financed health system. Stated more plainly, left to their own devices, even punitive states that attempt to curb Medicaid enrollment are likely to find their caseloads growing over time as they incarcerate larger shares of their populations. Based on prior research, we speculate that this is because of the financial pressures placed on families of incarcerated individuals (see Braman, 2002, 2004; Clear, 2007; Murray, 2005), thus rendering them eligible for Medicaid even under relatively restrictive enrollment criteria.

Our interpretation of Figure 2 is consistent with prior work that looks at the role of “marginal offenders” in mass incarceration. In analyzing the rise of mass incarceration, Weiman, Stoll, and Bushway (2007) point out that prison populations expanded by taking in greater numbers of low-level offenders, or “marginal offenders,” who commit relatively minor crimes at an infrequent pace. Since these marginal offenders may be more likely than more severe offenders to be connected to their families and/or employed, their incarceration may be particularly damaging to their families’ financial situation. Thus, as Figure 2 illustrates, when prison populations grow, collateral consequences become even more severe—in this case, our research coincides with and expands on the prior literature by finding that the collateral consequences include the expansion of publicly financed health care.

Summary and Conclusion

Overall, our results support an institutional perspective that links Medicaid enrollments and incarceration policies that generate increased demands for social services. In support of the collateral consequences theoretical model, our analysis shows a positive relationship between incarceration rates and states’ Medicaid enrollments over time. While we do not have information on how many inmates had parental responsibilities or provided financial support to children or primary caregivers,

prior research tells us that this is a substantial number (Martrone, 2005; Travis et al., 2003). This may be particularly true in light of the considerable churn in prison populations—incarceration figures measure the number of people held in prison at mid-year, while Medicaid figures measure unique beneficiaries. Thus, flows into and out of prison may touch a greater number of families than are represented in the incarceration data.

Yet, the relationship between incarceration and Medicaid is not a simple one. That is, it is not always the case that states with higher incarceration rates are more likely than states with relatively fewer prisoners to address increased demands for Medicaid by expanding enrollment. To the contrary, when we control for annual fluctuations, we find that the relationship between Medicaid and incarceration is negative, though this relationship is significant in only one of the three models. Had this result been more consistently statistically significant, it would have offered strong support for the punitive regime thesis, that states with harsh penalty regimes also make fewer social welfare efforts (see Western & Beckett, 1999). As it is, the results in Models 3 through 5 indicate that there is a modest negative relationship between incarceration and Medicaid, which offers some support for the punitive regime thesis.

Our findings here indicate that policy makers whose actions and inactions result in increased incarceration—by design or otherwise—will nonetheless confront increasing demands for government health care assistance. Moreover, states that rely more heavily on incarceration and thereby increase the demand for publicly financed health care may be less likely than others to fulfill this demand. Future research will determine if the responses to these incarceration-driven demands result in contractions or expansion of Medicaid eligibility within states. If stricter Medicaid rules have been a typical response to growing prison populations, the results here may understate the true impact of incarceration policy on the need for the health care safety net.

With these results, we offer unique contributions to the sociological literatures on punishment and the welfare state. First, by considering Medicaid instead of AFDC/TANF rates as a measure of social welfare provisions, we extend prior tests of a punitive regime thesis. With this adjustment in place, our analyses diverge somewhat from Beckett and Western's (2001) findings that punitive states govern socially marginal groups through both stingy public benefits and punitive incarceration practices. Though our results do show a negative cross-sectional relationship between incarceration and Medicaid, this relationship is not consistently statistically significant, and thus not very robust. Moreover, as we discuss above, our results suggest important limitations to this style of governance since states that restrict public benefits in such a way may find themselves with increasing Medicaid enrollments, as a function of the punitive incarceration practices. Second, by considering social welfare provisions as an outcome rather than a cause of punishment, we also contribute to the emerging literature on the collateral consequences of mass incarceration. Building on existing work that considers how punishment shapes communities (Clear, 2007; Mauer & Chesney-Lind, 2002), families (Braman, 2002, 2004; Comfort, 2008; Girshick, 1996; Harris & Miller, 2003; Travis & Waul, 2003), job markets (Western, 2006), and democratic participation (Manza & Uggen, 2006), we use an institutional perspective to better understand how punishment influences the social safety net.

Perhaps more importantly, our analyses show how both of these potentially competing theoretical perspectives complement one another. States' punitive characters might have some influence on both punishment and welfare policies, yet escalating prison populations can lead to greater reliance on publicly financed health care (in spite of a state's reluctance to provide such a benefit). We thus use a novel methodological approach to illustrate that although punishment and welfare are linked, the relationship between them is more complicated than considered by most current empirical investigations (for an exception, see Western, 2006).

Our results also offer an important contribution to policy orientations toward marginalized groups in the United States. By finding that imprisonment and publicly financed health care are linked at the state level, our work suggests additional avenues through which the most disadvantaged members of

society are further marginalized. This is important since similar groups of Americans comprise majorities of both prison populations and Medicaid recipients: those who are uneducated, low-income, and/or racial/ethnic minorities. Our results indicate that it is a mistake to consider policies and state funding decisions affecting marginalized groups as discrete; instead, we should consider how diverse state policies and institutions interact to put marginalized groups at increased risk of entrenched poverty, poor health, and other problems.

Though this article offers important contributions to our understanding of the link between Medicaid and incarceration, it is important to keep in mind the limitations to our analyses. Perhaps most importantly, without more detailed data or a more nuanced understanding of *how* Medicaid and incarceration are linked, we are unable to specify the causal connection between them. That is, with the available data we cannot provide direct evidence that the individuals who enroll in Medicaid are related to those who go to prison and that the latter event is responsible for the former. Rather, our results empirically demonstrate a relationship, even when taking into account other (potentially spurious) causes of both, such as demographics and crime trends. Though we are not able to specify such a causal connection with our models, our results are consistent with prior work that does illustrate such a connection, in that our results mirror prior evidence on how incarceration deprives families of material support and forces many onto public assistance (e.g., Braman, 2002, 2004; Clear, 2007; Murray, 2005).⁹ Future analyses should incorporate more detailed information on political and administrative factors that contribute to variation in Medicaid enrollments. These include measures of fiscal pressures and receipt of other public assistance such as TANF.¹⁰

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Notes

1. Additionally, since 1997, many children in families with incomes exceeding state Medicaid eligibility standards have been enrolled in the SCHIP. Because SCHIP is a nonentitlement federal–state program, in most cases, states are given greater latitude to set eligibility standards.
2. Though others have questioned the magnitude of the link between incarceration and unemployment (see Greenberg, 2001), Western and Beckett advance our understanding of the multiple and complex ways in which welfare and criminal justice institutions are linked.
3. Importantly, Beckett and Western (2001; see also Western & Beckett, 1999) do control for crime rates in their analyses. Yet, the potential link between these two phenomena suggests that additional analyses with alternate measures may clarify the relationship between social services and imprisonment.
4. We obtain these variables from Stemen, Rengifo, and Wilson (2006), using their data that are publicly available through Interuniversity Consortium for Political and Social Research (study no. 4456). They include data from every 3 years, lagged 1 year; to match their data to our annual series, we imputed the year

- preceding and following each of their data points to be equal to the year falling in between (e.g., they list data for 1993, we set 1992 and 1994 years equal to the 1993 data).
5. The violent crime rate measure includes homicide, rape, robbery, and assaults per 100,000 population; the property crime rate includes burglary, larceny, and motor vehicle thefts.
 6. No new states adopted three-strikes laws after 1995. Ohio adopted a determinate sentencing in 1996, and Wisconsin did so in 1999 (see Stemen, Rengifo, & Wilson, 2006).
 7. See <http://www.kff.org/medicaid/enrollment.cfm>; accessed January 25, 2010.
 8. An important limitation of this corrective strategy is that it assumes a consistent effect across states, which is unlikely. However, given that the correction did not alter the models, and that Medicaid and incarceration exist on such different scales and primarily affect different populations, we are confident that this is not a major problem for our analyses.
 9. It is also possible that reforms such as the implementation of SCHIP and the overhaul of welfare in the late 1990s have distorted our measures of Medicaid rates or altered the relationship between Medicaid and incarceration. We doubt that this is the case since these services are distinct from Medicaid. SCHIP is designated for children whose families' incomes exceed Medicaid eligibility limits, and the national total SCHIP enrollment is small compared to Medicaid enrollment (see U.S. Census, 2010). The overhaul of AFDC/TANF did not include alterations to Medicaid itself, though it did change the Medicaid enrollment process by decoupling it from AFDC enrollment. But the sudden inconsistencies shown in Figure 2, where the annual marginal effects of incarceration on Medicaid fall after 1995 and then rise again, leave some room for doubt. Whether Medicaid rates are tainted by cross-institutional effects is the subject of future research.
 10. Prior studies linking public assistance and imprisonment examine data prior to the welfare reforms of the 1990s (Beckett & Western, 2001; Greenberg & West, 2001; Western & Beckett, 1999). Though it would be valuable to extend their analyses by including AFDC/TANF payments in research that considers Medicaid rates as well, changes to the public assistance program complicate these efforts.

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