Mass Imprisonment and Inequality in Health and Family Life

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Abstract

In response to drastic increases and enduring disparities in American imprisonment, researchers have produced an expansive literature on the effects of mass imprisonment on inequality in America. We discuss this literature in three parts. First, we consider the obstacles to estimating the effects of imprisonment on individuals and to using those estimates to calculate the macrolevel impact of incarceration. Second, we review existing literature on the effect of mass imprisonment on inequalities in health and family life. Finally, we close by suggesting directions for future research.

INTRODUCTION

Scholars of punishment have long acknowledged that individuals, whether or not they have committed a crime, do not possess equal chances of incarceration.[1] Over time and across societies, entering a prison has meant dwelling overwhelmingly among the poor, poorly educated, mentally ill, and socially estranged (e.g., Goffman 1961, Ignatieff 1978, Rothman 1971, Sykes 1958). In the United States throughout the twentieth century, prisons also housed a much larger share of the African American than the white population (e.g., Blumstein & Beck 1999, Pettit 2012).

That a society's population of inmates is not a random sample of its total population is a social scientific truism. Historically, studies of the relationship between inequality and punishment have produced some variant of this conclusion. In the past 15 years, however, social scientists have turned previous work on the relationship between inequality and punishment on its head. Rather than ask whether African Americans, the poor, or individuals with mental illness or tenuous family connections are more likely to be incarcerated than otherwise comparable individuals, they have asked whether imprisonment itself might widen preexisting racial inequality or inequality in earnings, health, or family stability (for reviews, see Clear 2008, Comfort 2007, Hagan & Dinovitzer 1999, Murray & Farrington 2008, Schnittker et al. 2011, Wakefield & Uggen 2010, Wildeman & Western 2010).

The shift in the focus of research on punishment and inequality was inspired by vast increases in the use of incarceration in the United States. Whereas roughly 1 in 500 American adults was in prison in 1973, by 2000 that number had leapt to roughly 1 in 100. Increases in the imprisonment rate boosted men's lifetime risk of imprisonment. A man born in 1974 had a 2.3% chance of ever being imprisoned; by 2001 that risk had increased to 4.9% (Bonczar 2003). For black men without a high school degree, the risk of imprisonment was greater than 60% (Pettit & Western 2004). In less than 30 years, incarceration became common enough that its distributional implications began gaining the attention of scholars outside of criminology.

Demonstrating that incarceration affects inequality, however, has proved to be a challenging endeavor. There are four principal reasons for this. First, inequality in individuals' chances of being incarcerated makes it difficult to disentangle cause from effect. Because prisoners are disproportionately poor and mentally ill, for example, it is easy to mistakenly attribute their poverty or mental illness to the experience of incarceration itself. Second, even when researchers can confidently identify a causal effect of incarceration, heterogeneity in that effect across individuals can complicate its distributional impact. If incarceration produces more permanent cognitive damage among the psychologically unstable than among healthier individuals, it might widen preexisting health inequalities. If incarceration provides minimal health care for the unhealthiest, but exposes the healthy to diseases they would have avoided outside of prison, it could narrow preexisting health gaps. Third, the magnitude of any effect on inequality is limited by the distribution of the outcome. If prisoners are located at the far left tail of the income distribution, for example, incarceration's effect on income inequality will be mechanically constrained. Finally, aggregating up from an effect of incarceration on current or former prisoners assumes the experience affects only those who have experienced it directly (e.g., Sampson 2011). Research suggests this is unlikely.

Scholarship to date has seldom confronted these challenges directly. Indeed, although previous studies routinely document selection into prison on the basis of education, income, sex, and neighborhood (e.g., Wakefield & Uggen 2010, Western 2006), virtually no research directly tests how mass incarceration contributes to inequality in any of these domains. The only area we know to have come close to demonstrating incarceration's effect on inequality is

[1]We use the term incarceration throughout to mean time spent in either prisons or jails.

research on racial disparity. Because of severe racial disparities in incarceration, any negative effects of the experience—provided they affect all individuals similarly—will be concentrated among African Americans. If incarceration negatively affects prisoners' health or family lives, it will consequently widen racial disparities in these outcomes. But even in this area, studies directly examining inequality are scant.

In this review, we discuss research on the effects of incarceration on inequality in health and family life. Our article differs from previous reviews (Clear 2008, Comfort 2007, Hagan & Dinovitzer 1999, Murray & Farrington 2008, Schnittker et al. 2011, Wakefield & Uggen 2010, Western & Wildeman 2009, Wildeman & Western 2010) in its focus on the theoretical, methodological, and data-driven challenges facing the study of punishment and inequality. The difference in our approach is reflected in the organization of the article. Rather than review the literature and offer suggestions for future research, we start by setting a bar for studies estimating the relationship between punishment and inequality. We then measure previous research against that bar.

Taking stock of the substantial obstacles precluding a straightforward estimation of incarceration's effects on inequality might lead researchers to reassess whether this relationship is the sole metric by which to evaluate the institution. Indeed, we hope this review inspires such an assessment. Mass incarceration might drastically impact some dimensions of inequality while leaving others untouched. It might have negligible effects on inequality in wages but dramatically alter racial disparity in health, for instance. In hypothesizing that incarceration will affect all aspects of inequality, scholars may expect too much. In focusing solely on incarceration's effects on inequality, scholars may overlook other poorly understood facets of the experience of imprisonment—such as its effect on the psychological well-being of current and former prisoners. We conclude the article, therefore, by discussing the promise of new research considering incarceration's effects on outcomes other than inequality.

HOW MIGHT PUNISHMENT AFFECT INEQUALITY?

To date, researchers have used two methods to assess the effect of punishment on inequality. The first method estimates the effect of incarceration on individuals' earnings, health, or family life and then calculates the impact of this effect on the distribution of income, illness, or divorce in the population. The second method directly estimates the effect of incarceration rates on inequality in health or family life at some aggregate level—usually among states or nations. Both methods have benefits and drawbacks. We begin by considering barriers to estimating the effect of incarceration on individuals. We then discuss challenges to assessing the aggregate impact of incarceration on inequality. Throughout the discussion, we draw examples from the literature on incarceration and earnings. We then turn our attention to newer literatures on health and family life.

Incarceration's Effect on Individuals

Qualitative and experimental research suggests that the experience of imprisonment could affect former prisoners' earnings in two general ways (e.g., Pager 2007). First, because incarceration directly undercuts inmates' skills, knowledge, and experience—what economists call their human capital—it might transform their capacity to compete in the labor market. In an era when rehabilitation guided correctional philosophy (Garland 2001), a prison term might have taught inmates marketable skills. But the curtailment of correctional programming in the mid-1990s (e.g., Page 2004) made it more likely that prisoners would either lose or fail to gain valuable skills while in prison and consequently suffer diminished earnings upon release. Incarceration also severs prisoners' ties to their communities. These ties, which sociologists sometimes call social capital, often lead to formal employment (e.g., Granovetter 1973, Smith 2010).

Second, employers might respond negatively to the stigma associated with a criminal

record. Pager (2003, 2007), for example, combines field experimental and interview evidence to show that the negative credential of a criminal record leads job applicants to receive fewer calls from potential employers in response to an application. The experimental design of these studies enables the author to isolate the stigmatizing effect of incarceration on the chance of getting called back either for an interview or with a job offer. The stigma of a criminal record, moreover, is sometimes encoded in law, as when ex-felons are banned from obtaining employment licenses (Rubinstein & Mukamal 2002).

As we have noted elsewhere (Muller & Wildeman 2012), even with two potential mechanisms whereby incarceration could affect individuals, research using observational data to estimate a causal effect of incarceration faces considerable methodological obstacles. The major challenge follows from what we know about the distribution of inmates. Because drug use, mental illness, estrangement from romantic partners, and low levels of human and social capital are important predictors as well as possible outcomes of incarceration, it is difficult to distinguish the effects of imprisonment from the effects of being the type of person likely to be imprisoned. Concerns about selection bias suffuse social science, but they are particularly acute in this area, where there are strong theoretical and empirical reasons to believe that any effect of incarceration is solely attributable to negative endowments that increased an individual's likelihood of incarceration in the first place. In the literature on earnings, four methods have been used to address this challenge.

The first technique for addressing selection bias has been to adjust estimates of the effect of incarceration for observable characteristics of individuals. One variant of this method is covariate adjustment; another is a set of matching techniques that restrict a sample to individuals equally likely—based on their observable characteristics—to be incarcerated. In literature considering the consequences of incarceration for earnings, studies typically adjust for race, human capital, self-control, social attachments, and local labor market characteristics (Western 2002, p. 534). It is almost always necessary to adjust estimates of the effect of incarceration gleaned from observational data for observable characteristics of individuals, but doing so is seldom sufficient. As involvement in crime is rarely observed, it is unlikely that models conditioning exclusively on individuals' observable characteristics will prevent scholars from comparing individuals likely to go to prison with individuals likely not to.

A second technique for combating selection bias is to adjust estimates of the effect of incarceration for unobservable characteristics of individuals. This requires that all individuals in a sample be observed more than once, as is the case in longitudinal data. For example, using the National Longitudinal Survey of Youth 1979 (NLSY79) and adjusting for individual fixed effects, Western (2002, 2006) finds that having ever been incarcerated diminishes an individual's future earnings by roughly 30%. Fixed-effects and first-difference regressions add considerable credibility to causal estimates of the effect of incarceration. But they are unable to account for changes in individuals that coincide with the timing of their incarceration and affect both their earnings and their likelihood of incarceration (e.g., Corman et al. 2011).

A third method for circumventing selection bias is to identify a source of exogenous variation in incarceration that is uncorrelated with any other determinant of earnings. Kling (2006), for example, exploits the random assignment of defendants to harsh and lenient judges to estimate the effect of marginally longer prison sentences on postincarceration wages. Like all experiments, natural experiments of this kind face a tradeoff between clean identification and generalizability. Given the prevalence of recidivism among prisoners, moreover, random assignment to a harsh judge for a single offense may constitute too weak a treatment to significantly affect former prisoners' wages. Still, studies such as Kling's (2006) offer preliminary evidence that incarceration's apparent effect on wages might be driven by selection bias. In other cases, the local effect estimated using

exogenous variation in incarceration might be of greater interest.

One final, more informal, method of establishing causality is to estimate the effect of incarceration on unlikely outcomes in the same data set. Placebo regressions aim to show that incarceration is not associated with an outcome it cannot or should not be associated with. These methods, which have been applied in other fields (e.g., Cohen-Cole & Fletcher 2008), use either implausible outcomes or impossible timing to detect implausible effects. Scholars of punishment have only recently begun using them.

Incarceration's Effect on Inequality

As the preceding section indicates, due especially to selection into prison, estimating a causal effect of incarceration on individuals is difficult. Even if it were straightforward, however, scholars would still face challenges in assessing incarceration's effect on inequality. We first discuss the practice of using individual causal effects to calculate an aggregate effect on inequality. We then consider attempts to estimate directly the effect of incarceration rates on inequality using macrolevel data.

There are two major problems with aggregating up from individual causal effects. The first problem is that the effect of incarceration might vary significantly across individuals or subgroups. This is known technically as effect heterogeneity. Few studies test directly for effect heterogeneity. Moreover, even when an association between incarceration and earnings appears to vary by race, for example, it is difficult to distinguish differential selection into prison from the differential effects of imprisonment. Assuming a uniform average treatment effect, therefore, can lead to a biased calculation of incarceration's effect on earnings inequality. The second problem is that the effect of incarceration on earnings may not be limited to those who experience it directly. If incarceration additionally affects families (e.g., Western & Wildeman 2009), communities (e.g., Clear 2008), or crime (e.g., Johnson & Raphael 2012), aggregating up without accounting for spillover effects could lead scholars to underestimate or overestimate the population-level effect of incarceration (Sampson 2011). In light of these limitations, some scholars have attempted to estimate the effect of incarceration on inequality directly using macrolevel data on states or nations. Absent clear population-level mechanisms, however, it is unclear how well such studies are able to surmount the barriers to causal inference that impede research on individuals.

The magnitude of an effect of incarceration on inequality, moreover, is also constrained by where prisoners fall in the distribution of the outcome. If prisoners overwhelmingly fall near the left tail of the earnings distribution, incarceration's effect on earnings inequality cannot be large. This is precisely what research on earnings inequality finds. Despite the large effects of incarceration on the earnings of individuals, Western (2006, p. 127) concludes that mass incarceration increased lifetime earnings inequality among men by only three percent.

HEALTH

Until recently, there was little research on the health effects of incarceration outside of departments of medicine, public health, or epidemiology (for a review, see Fazel & Baillargeon 2011). But the past five years have seen a dramatic expansion in the social scientific literature on incarceration and health (for a review, see Schnittker et al. 2011). We begin by discussing the health of prisoners before, during, and after their incarceration. Assessing the health of eventual prisoners before they experienced incarceration helps us gauge the extent to which selection bias will hinder our ability to estimate a causal effect. Distinguishing the consequences of incarceration from the consequences of release is necessary because we expect these experiences to affect prisoners' health in different ways. We then broaden our focus to encompass studies linking incarceration to the health of prisoners' families and to inequality in population health. We summarize the data, methods, and outcomes of studies cited in this section in **Table 1**.

Table 1 Summary of cited studies on the incarceration-health relationship

Timing[a]	Outcome[b]	Reference	Inequality[c]		Data	Strongest quantitative test
Before/During	Health	Forrest et al. 2000	No	No	Sample of inmates in juvenile facility (Maryland)	Descriptive, with comparison
Before/During	Health/Access	Wilper et al. 2009	No	No	Jail/prison inmate surveys (national)	Descriptive, no comparison
Before/During/After	Health	Freudenberg et al. 2005	No	No	Nonrandom sample of adolescent jail inmates (NYC)	Descriptive, no comparison
Before/During/After	Partner's physical health	Lee & Wildeman 2012	Yes	No	n/a (theoretical)	n/a (theoretical)
Before/During/After	Child's body mass index	Roettger & Boardman 2012	Yes	No	National Longitudinal Study of Adolescent Health	Fixed effects
Before/During/After	Severe health impairments	Schnittker & John 2007	Yes	Yes	National Longitudinal Survey of Youth, 1979	Fixed effects
Before/During/After	Partner's mental health	Wildeman et al. 2012	Yes	No	Fragile Families and Child Wellbeing Study	Propensity scores
Before/After	Psychiatric disorders	Schnittker et al. 2012	No	No	National Comorbidity Survey Replication	Covariate adjustment
During	Chronic medical conditions	Binswanger et al. 2009	No	No	Multiple	Covariate adjustment
During	Access	Eber 2009	Yes	No	n/a (commentary)	n/a (commentary)
During	Mental health	Gawande 2009	No	No	n/a (journalistic)	n/a (journalistic)
During	Mental health	Haney 2003	No	No	Sample of inmates in solitary confinement (California)	Descriptive, with comparison
During	Mortality	Mumola 2007	No	No	All prison inmates (national)	Descriptive, with comparison
During	Mortality	Patterson 2010	Yes	No	Multiple	Covariate adjustment
During	Mortality	Rosen et al. 2011	Yes	No	All prison inmates (North Carolina)	Covariate adjustment
During/After	Mortality	Spaulding et al. 2011	Yes	No	All prison inmates (Georgia)	Covariate adjustment
During/After/Macro	Infant mortality	Wildeman 2012b	Yes	Yes	Pregnancy Risk Assessment Monitoring System, multiple	Fixed effects, placebos
After	Mortality	Binswanger et al. 2007	No	No	All recently released prison inmates (Washington)	Covariate adjustment
After	Health	Massoglia 2008a	Yes	No	National Longitudinal Survey of Youth, 1979	Propensity score, placebos
After	Self-rated health	Massoglia 2008b	Yes	Yes	National Longitudinal Survey of Youth, 1979	Propensity score

After	Drug-related mortality	Merrall et al. 2010	No	No	Multiple	Covariate adjustment
After	Mortality	Rosen et al. 2008	No	No	All recently released prison inmates (Georgia)	Covariate adjustment
After	Cardiovascular disease	Wang et al. 2009	Yes	No	Coronary Artery Risk Development in Young Adults Study	Covariate adjustment
Macro	AIDS	Johnson & Raphael 2009	No	No	Multiple	Fixed effects, placebos
Macro	Various	Thomas & Torrone 2006	Yes	Yes	Counties in North Carolina	Covariate adjustment
Macro	Mortality	Wildeman 2012a	Yes	Yes	Multiple	Fixed effects, placebos

[a]All studies using longitudinal data are classified as having Before/During/After timing, as they are not restricted to any one period.
[b]Because many of the studies we reviewed consider many outcomes simultaneously, general terms are used whenever the analysis considered some combination of conditions.
[c]The first column indicates whether inequality is used as a key component of the frame. The second column indicates whether the analysis tested for effects on inequality. The assessment of whether a paper uses inequality in the frame is subject to debate.

Health Before Incarceration

Prisoners have disproportionately low levels of education and hail predominantly from poor African American communities. As each of these characteristics is independently correlated with poor mental and physical health and higher mortality risk (e.g., Diez Roux & Mair 2010, Elo 2009, Williams et al. 2010), eventual prisoners may have worse health than others even before their incarceration. However, as some crimes require a level of exertion incompatible with poor health, some speculate that inmates should be healthier than the free population prior to incarceration (Fazel & Benning 2006).

Assessing the relative merit of these perspectives is challenging because we lack data measuring the health of individuals immediately before their incarceration. Absent these data, researchers have used information about the health of prisoners at many points prior to their incarceration to construct an approximate counterfactual comparison (e.g., Forrest et al. 2000, Wilper et al. 2009). Freudenberg et al. (2005), for example, show that 22% of male adolescent jail inmates and 41% of female adolescent jail inmates had asthma prior to incarceration. Schnittker et al. (2012) show that individuals who were incarcerated experienced several psychiatric disorders prior to incarceration, including post-traumatic stress disorder, dysthymia, and intermittent explosive disorder. Wildeman et al. (2012) show that the romantic partners of men who would eventually be incarcerated were 11 percentage points more likely to be depressed than other women prior to their partner's incarceration.

The limited information we have suggests that individuals who experience incarceration—as well as their family members—would have been in poor health irrespective of their incarceration. This suggests that observational associations between incarceration and better health can be met with less skepticism than associations between incarceration and poor health. But our knowledge in this area remains severely limited.

Health During Incarceration

Whether the experience of incarceration itself improves or worsens prisoners' health depends on the type of health we measure. Prisons tightly monitor violence and are constitutionally mandated to provide healthcare to inmates. Given that prisoners are overwhelmingly drawn from communities with little access to healthcare (Patterson 2010) and frequent exposure to violence (Spaulding et al. 2011), incarceration might provide momentary protection to individuals otherwise at elevated risk of homicide or treatable disease (Comfort 2007, Patterson 2010, Spaulding et al. 2011). But incarceration might also exacerbate stress-related diseases (Abbott 1981), push those with mental illnesses to psychological extremes (Gawande 2009), or expose inmates to diseases more likely to spread in environments of close human contact and poor air circulation (Farmer 2002). We first consider the potential protective effects of incarceration and then turn to its negative consequences.

Nearly every study on incarceration and mortality finds that prisoners have lower mortality rates than otherwise comparable individuals. Most studies link administrative data on correctional populations with the National Death Index (NDI), which tabulates every person who has died in the United States since 1979 and their cause of death (Mumola 2007, Patterson 2010, Rosen et al. 2011). These studies then compare mortality among prisoners with mortality among nonincarcerated individuals of the same age, race, sex, and (sometimes) education. One such study finds that the free population was at a 15% higher mortality risk than prisoners of the same age, sex, and race. Four causes of death—accidental poisoning, homicide, suicide, and transportation injuries—accounted for most of the difference (Spaulding et al.2011).

Incarceration's apparent protective effects on mortality, however, tend to be concentrated exclusively among African Americans. White prisoners' rates of mortality were slightly higher than those of free whites in all studies, whereas mortality rates for incarcerated African Americans were much lower than those of nonincarcerated African Americans (Mumola 2007, Patterson 2010, Rosen et al. 2011, Spaulding et al. 2011). The reasons for heterogeneity in the effect of incarceration on mortality have been a matter of considerable debate. Some stress the higher baseline mortality rates of African Americans (e.g., Spaulding et al. 2011); others suggest that the relationship is driven primarily by minimal health care improvements in prison (e.g., Patterson 2010); still others focus on the fact that accidental and violent causes of death are simply much less likely to occur in controlled environments (e.g., Rosen et al. 2011).

Mandated prison health care may also be responsible for prisoners' comparative lack of severe health impairments. Schnittker & John (2007) find that prisoners suffer from fewer of these impairments even after adjusting for fixed traits of individuals. The difference between the incarcerated and the nonincarcerated, moreover, does not vary by race. The research design employed by this study is stronger than those employed in the mortality studies. Nonetheless, because the effects of incarceration in both cases move against the forces of selection, both effects appear plausible.

Studies of incarceration's effect on other health outcomes point in the opposite direction. One study, for instance, shows that inmates suffer higher rates of hypertension, asthma, arthritis, cervical cancer, and hepatitis than otherwise comparable individuals (Binswanger et al. 2009), echoing an earlier literature highlighting inmates' poor health (for reviews, see Fazel & Baillargeon 2011, Schnittker et al. 2011). The experience of incarceration may also have profound psychological consequences—especially for those who experience prolonged solitary confinement—although research in this area is limited (e.g., Gawande 2009, Haney 2003).

Physicians note that prisons often facilitate the spread of infectious diseases, most notably tuberculosis and HIV (e.g., Farmer 2002, Baussano et al. 2010). Diseases that spread

through concentration within a prison, moreover, may diffuse throughout the population once inmates are released (e.g., Johnson & Raphael 2009, Thomas & Torrone 2006). Combined with significant unmet needs in physical and mental health services within prisons (e.g., Eber 2009, Wilper et al. 2009), the short-term mortality and health gains of incarceration may therefore come at a long-term cost, creating new health problems and neglecting existing ones. But the data currently at our disposal do not facilitate strong causal tests of this hypothesis.

Health After Incarceration

If prisons provide momentary health benefits for prisoners while they are incarcerated by controlling violence and supplying minimal health care, these benefits vanish when prisoners are released. Unlike current incarceration, prior incarceration appears uniformly to worsen prisoners' health. Previous research offers three reasons for this. First, health declines upon release could be driven entirely by selection, as most inmates return to the dangerous neighborhoods prisons momentarily protected them from. Second, prisoners' lower tolerance for drugs and stressful transition out of institutionalization may heighten their mortality risks from drug- and stress-related illnesses. Finally, inmates might face lasting stigma in the eyes of employers and health care providers.

Former prisoners' mortality risk spikes markedly upon release from prison (Binswanger et al. 2007, Merrall et al. 2010, Spaulding et al. 2011, Rosen et al. 2008). Recently released prisoners' mortality is up to 12.7 times (Binswanger et al. 2007) that of comparable individuals. The reasons for this spike, however, are less clear. One way to assess whether mortality increases are due to the experience of incarceration is to consider the cause of death. Rosen et al. (2008) and Spaulding et al. (2011) show that much of the excess mortality among former inmates is attributable to accidents, homicide, and HIV—the first two of which incarceration should have insulated them from. Studies using a shorter follow-up period, on the other hand, find strong evidence that drug use accounts for a considerable portion of the mortality increase (Binswanger et al. 2007). Other studies show that incarceration is associated with elevated risks of cardiovascular disease after release (Wang et al. 2009).

Researchers have also considered incarceration's durable effects on morbidity. Massoglia (2008b) and Schnittker & John (2007) argue that health effects lasting beyond the immediate postrelease period are likely to be the product of stigma or stress-related and infectious diseases. Schnittker & John (2007) find strong evidence that incarceration has long-term health consequences, even after adjusting their estimates for fixed characteristics of individuals. Massoglia (2008a) uses a matched sample and runs extensive placebo regressions on other health conditions to show that prior incarceration increases the risk of infectious and stress-related diseases. Of the research linking prior incarceration to poor health, these studies provide perhaps the strongest evidence to date.

Health Spillover Effects of Incarceration

An emerging literature considers how having an ever-incarcerated family member might influence the health and well-being of women and children. Given the prevalence of sexually transmitted infections (STIs) and other infectious diseases among prisoners (Fazel & Baillargeon 2011), a large body of research examines the direct and indirect ways having a romantic partner incarcerated or living in a high-incarceration neighborhood might increase women's risk of contracting HIV and other STIs. Other research studies the effects of parental incarceration on children's health.

Drawing on research in social epidemiology linking women's cardiovascular disease with socioeconomic status, family life, and stress, some scholars have speculated that the incarceration of a male family member could increase

women's risk of cardiovascular disease (Lee & Wildeman 2012). Others estimate the effect of incarceration on the mental health of prisoners' romantic partners (Wildeman et al. 2012). Although the latter study documents a robust association between the incarceration of a romantic partner and women's poor mental health, it does not adjust for unobserved characteristics of respondents. As women are more likely to come into contact with prisons and jails through the men to whom they are attached than through their own incarceration, however, spillover effects may be the primary way incarceration affects women's health.

Two studies consider the consequences of parental incarceration for children's health. Wildeman (2012b) finds an association between parental incarceration in the past year and elevated infant mortality risk, but only if the father was not reported to have engaged in domestic violence. Again, the data do not permit the author to control for fixed traits of the father or the family, making it hard to decipher whether the relationship is causal. A second study finds that parental incarceration is associated with increases in the body mass indices (BMI) of girls but not boys (Roettger & Boardman 2012). Although this study adjusts for stable traits, the change in these models is driven by children whose father was incarcerated for the first time when the child was a teenager—a highly unrepresentative age of first parental incarceration (Wildeman 2009).

Health Inequality

Although many studies of the effects of incarceration are motivated by concerns over health inequality, few of them address inequality directly. Of the studies we review here, only five do so. Two of these use microlevel data and arrive at different conclusions. On one hand, Massoglia (2008b, p. 297) contends that "the penal system merits consideration as one of the fundamental systems of stratification that contributes to racial disparities in general health functioning." On the other hand, Schnittker & John (2007, p. 115) claim, "[I]ncarceration contributes only modestly to racial disparities" in severe health limitations.

Three studies use state-level data to study the effects of incarceration on health disparities. Johnson & Raphael (2009) combine state-level data on incarceration with the number of AIDS cases known to public health providers, a biologically informed estimate of the incubation period from exposure to HIV to the development of AIDS, and a theoretical framework incorporating the transmission dynamics of HIV in prisons. The authors then use a simulation to show that changes in incarceration could fully explain black-white disparities in AIDS for men and women. Two additional studies find increases in state-level incarceration rates to be associated with substantial jumps in the black-white gap in life expectancy at birth and in infant mortality (Wildeman 2012a,b). But as the precise mechanisms through which incarceration affects population distributions of infant mortality or life expectancy at birth are less clear, even in the presence of extensive controls for observed and unobserved characteristics of states, it is difficult to know whether these associations are causal.

Summary

Research on the effects of incarceration on health has at least three strengths: (*a*) clearly defined, testable mechanisms; (*b*) broadly representative data; and (*c*) effects that run in the opposite direction of selection. Research in this area also has three key limitations: (*a*) a dearth of longitudinal data, making it difficult to adjust for unobserved traits of individuals; (*b*) few sources of exogenous variation in incarceration; and (*c*) little attention to the mental health of inmates. We return to this last issue in some detail in the conclusion. Evidence of the effects of mass incarceration on inequality, furthermore, is far from definitive. One study proposes that incarceration might have a large effect on racial inequality in AIDS (Johnson & Raphael 2009). But outside of this sole example, our knowledge about the effects of incarceration on health inequality is limited.

FAMILY

As with research on the incarceration-health relationship, there has been considerable growth in the social scientific literature on the relationship between incarceration and family life (see the reviews of Comfort 2007, Hagan & Dinovitzer 1999, Murray & Farrington 2008, Wildeman & Western 2010). To date, scholars have primarily considered the consequences of incarceration for family structure and child well-being. Unlike research on health, which has almost no qualitative component, research on incarceration and family life is motivated by a rich qualitative literature. The lack of studies using administrative data (or other data with low rates of attrition) and the absence of clearly defined and tested mechanisms, however, have impeded progress in this area.

We review research on each outcome at two stages: (*a*) before incarceration and (*b*) during and after incarceration. We close by discussing the potential implications of incarceration for racial inequality in family structure and child well-being. We summarize the data, methods, and outcomes of studies cited in this section in **Table 2**.

Family Life Before Incarceration

Scholars have long argued that the size and gender balance of neighborhood marriage markets affect neighborhood-level marriage rates (e.g., Becker 1991, Wilson 1987). In poor communities, women outnumber men generally and employed men especially. As incarceration is concentrated in neighborhoods already possessing gender-imbalanced marriage markets (e.g., Harknett & McLanahan 2004, Sampson & Loeffler 2010), these communities' marriage rates should be lower than average irrespective of their rate of incarceration. Qualitative research on the marriage decisions of men (Anderson 1999, pp. 142–78) and women (Edin 2000) supports this contention.

Scholarship also suggests that the children of the ever-incarcerated are at a disadvantage to the general population even before their parent's incarceration. Soon-to-be-incarcerated men were less likely than other men to be married to the mother of their children (32% versus 11%) or cohabiting with them (20% versus 16%), and far more likely to be separated from them (64% versus 43%). Mothers who had children with these men, in turn, reported lower relationship quality, lower shared responsibility in parenting, and lower cooperation in parenting with the father than other mothers, as well as higher rates of prior domestic violence (17% versus 6%) (Wildeman et al. 2012). Here, too, quantitative analysis is supported by qualitative research. Giordano (2010, pp. 147–50), for example, suggests that a mixture of family instability and parental criminal activity would have placed children at risk for a host of problems ranging from behavioral problems to trouble in school, regardless of incarceration. Ethnographic research shows that for many families (Braman 2004, p. 42) and romantic partners (Comfort 2008, pp. 163–67), the incarceration of a drug-addicted family member can provide a brief respite from exposure to addictive behavior. In light of several forms of preexisting family instability, children of fathers who would eventually be incarcerated might exhibit more behavioral problems even absent parental incarceration (e.g., Johnson 2009, pp. 190–92).

Family Life During and After Incarceration

Literature on the effect of current and former incarceration on family life falls into three broad categories: studies of marriage and divorce, studies of family functioning, and studies of child well-being. We review these in turn.

Lopoo & Western (2005, pp. 729–30) demonstrate that current inmates are both less likely to marry and more likely to divorce than otherwise comparable individuals. Former prisoners, however, have no lesser chances of marrying and no greater risks of divorcing after adjusting for relevant predictors of incarceration, marriage, and divorce (Apel et al. 2010, Lopoo & Western 2005). Massoglia et al. (2011) suggest that current prisoners' high rate of divorce is due to the strain of separation

Table 2 Summary of cited studies on the incarceration-family relationship

Timing[a]	Outcome[b]	Reference	Inequality[c]		Data	Strongest quantitative test
Before/During After	Marriage and divorce	Apel et al. 2010	No	No	Criminal Career and Life-Course Study (Netherlands)	Propensity scores
Before/During/After	Family and community life	Braman 2004	Yes	No	Poor communities in Washington, DC	n/a (qualitative)
Before/During/After	Child grade retention	Cho 2009a	No	No	Women visiting partners at San Quentin (California)	n/a (qualitative)
Before/During/After	Child reading/math scores	Cho 2009b	No	No	Administrative data (Chicago)	Propensity scores (change)
Before/During/After	Relationship with partner	Comfort 2008	Yes	No	Administrative data (Chicago)	Propensity scores (change)
Before/During/After	Financial contributions	Geller et al. 2011	Yes	No	Fragile Families and Child Wellbeing Study	Fixed effects
Before/During/After	Child behavioral problems	Geller et al. 2012	Yes	No	Fragile Families and Child Wellbeing Study	Fixed effects, placebos
Before/During/After	Child criminality	Giordano 2010	No	No	Ohio Life-Course Study	n/a (qualitative)
Before/During/After	Child behavioral problems	Johnson 2009	Yes	No	Panel Study of Income Dynamics	Covariate adjustment
Before/During/After	Marriage and divorce	Lopoo & Western 2005	Yes	Yes	National Longitudinal Survey of Youth, 1979	Covariate adjustment
Before/During/After	Divorce	Massoglia et al. 2011	No	No	National Longitudinal Survey of Youth, 1979	Covariate adjustment
Before/During/After	Child behavioral problems	Murray et al. 2012	No	No	Pittsburgh Youth Study	Propensity scores
Before/During/After	Paternal involvement	Nurse 2002	Yes	No	Sample of juvenile incarcerated fathers (California)	n/a (qualitative)
Before/During/After	Maternal material hardship	Schwartz-Soicher et al. 2011	Yes	No	Fragile Families and Child Wellbeing Study	Fixed effects
Before/During/After	Paternal involvement	Swisher & Waller 2008	Yes	No	Fragile Families and Child Wellbeing Study	Covariate adjustment
Before/During/After	Child behavioral problems	Wakefield & Wildeman 2011	Yes	Yes	Multiple	Fixed effects
Before/During/After	Paternal involvement	Waller & Swisher 2006	No	No	Fragile Families and Child Wellbeing Study	Covariate adjustment

Before/During/After	Child physical aggression	Wildeman 2010	Yes	No	Fragile Families and Child Wellbeing Study	Fixed effects, placebos
During	Teacher expectations	Dallaire et al. 2010	No	No	Nonrandom sample of teachers	Experimental design
During	Mother-child relationship	Poehlmann 2005a	No	No	Nonrandom sample of children visiting imprisoned mothers	Descriptive
During	Child test scores	Poehlmann 2005b	No	No	Nonrandom sample of children visiting imprisoned mothers	Descriptive
After	Child social exclusion	Foster & Hagan 2007	Yes	No	National Longitudinal Study of Adolescent Health	Covariate adjustment
After	Child educational outcomes	Foster & Hagan 2009	Yes	No	National Longitudinal Study of Adolescent Health	Propensity scores
After	Child drug and alcohol use	Roettger et al. 2011	Yes	No	National Longitudinal Study of Adolescent Health	Covariate adjustment
After	Child delinquency and arrest	Roettger & Swisher 2011	Yes	No	National Longitudinal Study of Adolescent Health	Covariate adjustment
Macro	Marriage rates	Charles & Luoh 2010	Yes	Yes	Multiple	Fixed effects, IV[e]
Macro	Child educational outcomes	Hagan & Foster 2012[d]	Yes	No	National Longitudinal Study of Adolescent Health	Covariate adjustment
Macro	Marriage rates	Mechoulan 2011	Yes	No	Multiple	Fixed effects, IV[e]

[a]All studies using longitudinal data are classified as having Before/During/After timing, as they are not restricted to any one period.
[b]Because many of the studies we reviewed consider many outcomes simultaneously, general terms are used whenever the analysis considered some combination of conditions.
[c]The first column indicates whether inequality is used as a key component of the frame. The second column indicates whether the analysis tested for effects on inequality. The assessment of whether a paper uses inequality in the frame is subject to debate.
[d]Cho (2011) also modeled indirect effects of imprisonment rates on children, but her intention was not to test such effects, so we focus our discussion of such effects on Hagan & Foster (2012).
[e]IV refers to instrumental variables.

during a partner's prison term rather than the stigma women face by association. Comfort (2008) uncovers some exceptions to this rule. In some cases, she argues, incarceration provides prisoners' partners a level of intimacy they had previously been denied (Comfort 2008).

Analyses of macro- and microdata in this area generally agree. Charles & Luoh (2010) find that increases in incarceration are negatively associated with women's likelihood of having ever married. Unexpectedly, in some tests, the effects of incarceration were largest for whites. Analyses using a different range of years, furthermore, found small effects of the black male incarceration rate on the proportion of black women who had ever been married. These effects were concentrated in the earliest years of the data analysis—the 1970–1980 period (Mechoulan 2011, p. 30).

Due mostly to data limitations, there are fewer studies of the effect of parental incarceration on family functioning. Nearly 40% of fathers who completed the initial interview in the Fragile Families and Child Wellbeing Study, for example, had left the sample by the child's fifth birthday (Geller et al. 2011). Other quantitative data, such as the NLSY79, fail to meaningfully measure family functioning. Research using the Fragile Families survey nonetheless documents robust associations between paternal incarceration and increases in maternal material hardship (Schwartz-Soicher et al. 2011), decreases in paternal financial contributions to family life (Geller et al. 2011), decreases in paternal engagement (Swisher & Waller 2008, Waller & Swisher 2006), and increases in the legal debt of women married to ex-inmates (Harris et al. 2010). Again, not all of these studies adjust for unobserved traits of respondents, making it hard to discern whether the relationships they report are causal.

Given deficits of relevant high-quality quantitative data, qualitative research has provided perhaps the richest source of information we have about the families of the incarcerated. Braman's (2004) ethnographic work among the families of current and former prisoners in Washington, DC, for example, chronicles how the absence of incarcerated men affects their wives and romantic partners, siblings, and children. Comfort's (2008) study of women visiting their incarcerated partners documents how incarceration transforms the lives of inmates—sometimes, in the short term, for the better. Nurse (2002, pp. 52–54) shows how incarceration promotes violent responses to confrontation among men and allows the mothers of prisoners' children to move on to new partners. As these studies do not observe families before incarceration, it is difficult to tell whether incarceration itself is responsible for the patterns they observe. Still, qualitative research of this kind can set tentative statistical correlations on firmer causal ground.

One exception to our lack of knowledge about the mechanisms linking parental incarceration and child well-being comes from psychology. Using vignettes, Dallaire et al. (2010) experimentally vary the purported reason a new child is starting in a teacher's class to examine how maternal incarceration shapes teachers' perceptions of students. The authors find that teachers' expectations of children with incarcerated mothers were lower than they were for children who were new to their class for other reasons (such as their mother being in rehabilitation). As nearly all accounts of the consequences of parental incarceration for child well-being speculate that stigma is a primary driver of the relationship, the results from this study provide hitherto missing verification that the stigma of parental incarceration is transmitted to children.

Numerous studies have shown that paternal incarceration is associated with increases in children's physical aggression (Wildeman 2010) and behavioral problems (Geller et al. 2012, Johnson 2009, Wakefield & Wildeman 2011). The data used to test these relationships allow the authors to use a range of techniques, including adjusting for fixed characteristics of individuals, matching children whose parents are likely or not to experience incarceration based on observed traits, and testing for implausible effects by predicting

past behavioral problems with future paternal incarceration.

Evidence about the consequences for older children is mixed, perhaps because of considerable variation in the data sets used. Studies find a relationship between paternal incarceration and children's delinquency and arrest (Roettger & Swisher 2011), trajectories of drug use and abuse (Roettger et al. 2011), educational detainment (Foster & Hagan 2009), and severe forms of disadvantage (Foster & Hagan 2007). Murray et al. (2012), however, show that parental incarceration was associated with increases in theft but not marijuana use, depression, or academic performance. Cho (2009a,b) reports that maternal incarceration is associated with a decrease in children's probability of grade retention and no change in their reading or math scores.

High levels of incarceration may also indirectly affect children. Hagan & Foster (2012), for example, find that school-level rates of parental incarceration have a large effect on children's education in a range of domains, including their GPA, their educational attainment, and whether they received a college degree. There is also evidence that increases in the female imprisonment rate are associated with increases in foster care caseloads (Swann & Sylvester 2006). These studies advance the literature by connecting Clear's (2007, 2008) hypothesis about the effects of high neighborhood incarceration rates to the literature on children's outcomes.

Family Inequality

Of the studies reviewed here, only three examine whether incarceration might be related to inequality in family life. As with research on health inequality, all consider racial disparity. Two consider family structure (Lopoo & Western 2005, Charles & Luoh 2010); the other examines child behavioral problems (Wakefield & Wildeman 2011).

Lopoo & Western (2005) ask how different the proportion of black, white, and Hispanic men who had ever married would be had none of them experienced incarceration. They find that the proportion of blacks who would have ever married would have increased by approximately one percentage point, from just below 67% to just below 68%; for Hispanics and whites, the changes were smaller (Lopoo & Western 2005, p. 730). Charles & Luoh (2010) find no evidence that mass incarceration affected inequality in family structure.

Incarceration appears to have a larger impact on racial inequality in childhood outcomes. Combining cumulative risks of parental incarceration with estimates of the effect of paternal incarceration on children, Wakefield & Wildeman (2011) speculate that mass incarceration could have increased black-white disparities in children's total behavioral problems by up to 10%, with larger effects for externalizing and internalizing behavioral problems. These estimates, as the authors note, assume that incarceration affects only the children of the incarcerated (see also Sampson 2011). But the authors' conclusions suggest that the consequences of mass incarceration for inequalities among children may be larger than for inequalities among adults.

Summary

Research on the consequences of incarceration for family life has at least three strengths: (*a*) the available data often allow scholars to adjust their estimates for unobserved traits of individuals, (*b*) one experimental study points the way forward for future research on causal mechanisms, and (*c*) quantitative research is generally supported by a rich qualitative literature. Research in this area also has three key limitations: (*a*) high attrition in most longitudinal data sets, (*b*) few sources of exogenous variation in incarceration, and (*c*) insufficient attention to family functioning. Evidence about the effects of incarceration on inequality in family life, furthermore, is far from definitive. One study uses straightforward methods to demonstrate that parental incarceration could have substantial effects on childhood inequality (Wakefield & Wildeman 2011). Two studies testing for racial inequality

in marital status find negligible effects (Charles & Luoh 2010, Lopoo & Western 2005).

CONCLUSION

We began this article by establishing a bar against which our progress in estimating the effect of punishment on inequality might be measured. We then reviewed existing research on the effects of incarceration on health, family life, and inequality in each of these outcomes. Our conclusions are sobering: Not only has selection into prison prevented us from drawing strong causal claims about the effects of incarceration on the health and family life of individuals, it has also all but ruled out any conclusions we might draw about how incarceration affected inequality in either of these domains.

To set our estimates of the effects of incarceration on surer causal footing, we will need to find new sources of data enabling us to follow individuals over multiple time periods, exploit exogenous variation in the assignment of prison sentences (e.g., Danziger et al. 2011, Green & Winik 2010), and run placebo regressions on implausible outcomes. We should also adopt experimental designs like those used by Pager (2007) to study the stigmatizing effects of a criminal record in domains beyond the labor market. The few studies that have taken these approaches give us perhaps the most reliable evidence on which to rest our conclusions about the effects of incarceration.

As prisoners come from narrow portions of the earnings and health distributions, scholars should also query whether incarceration could even hypothetically have a large effect on inequality in these areas. Previous research by Western (2006) raised this concern about inequality in earnings. Based on its past success, we see the most promise in research on how incarceration—because it is so strongly concentrated among poor African American communities—might worsen preexisting racial disparity in health (e.g., Johnson & Raphael 2009). Future research should also study historical epidemics generated in prison, such as the one that beset New York in the late 1980s (Farmer 2002), and their impact on population health and racial disparity in infectious disease.

Our review of the literature on incarceration and health also alerted us to an important oversight in previous research. Foundational studies in sociology examined how the experience of incarceration affected the inner lives of inmates (Clemmer 1940, Goffman 1961, Sykes 1958). With a few notable exceptions (Lerman 2009, Saperstein & Penner 2010, Schnittker et al. 2012), this strand of research was dropped just as the incidence of incarceration markedly increased. There are several possible reasons why incarceration's effect on mental illness has been understudied. First, ethnographic studies of prison life became increasingly infeasible as correctional officials became more protective of the public image of their institutions. Second, outside of a few administrative surveys, the mental health of prisoners is seldom measured. But this scholarly oversight means that we, as a nation, have mass administered a treatment the most important effects of which we know little about. As a first measure, scholars might begin interviewing recently released former prisoners about the effects of their experience. To date, perhaps our best knowledge about how incarceration affects the mental health of ex-prisoners comes from journalistic accounts on prolonged exposure to solitary confinement (Gawande 2009).

By measuring the current state of research on punishment and inequality in health and family stability against its ideal, we hope to have provided some guidance about how this literature might be strengthened. As scholars of punishment make continued efforts to estimate the effects of incarceration, however, they should not lose sight of their origins. As we have suggested elsewhere (Muller & Wildeman 2012), researchers should continue studying the causes of inequality in imprisonment. Persistent inequality in incarceration is of vital importance for understanding social inequality generally even if incarceration itself does nothing to exacerbate that inequality.

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