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# Linkages Between Incarceration and Health

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**Abstract**

The dramatic expansion of the US penal system during the past 4 decades has led to an increase in adverse health conditions that affect an unprecedented number of individuals. This article first provides an overview of the literature on the immediate and lasting associations between incarceration and physical health, highlighting the diverse health conditions linked with incarceration, including health functioning, infectious disease, chronic conditions, and mortality. Next, we discuss potential explanations for the associations between incarceration and these health conditions, focusing on stress, contagion, social integration, and reintegration challenges. We then consider how medical and social science research can be combined to advance our understanding of these health conditions and suggest ways to reduce the negative association between incarceration and health, such as by improving prison conditions and medical care both inside prisons and after release.

**Keywords**

incarceration, mechanisms, physical health, infectious disease, mortality

During the past 4 decades, the size and scope of the US penal system has expanded dramatically. The correctional system was nearly 4 times larger in 2016 than it was in 1980, and this broadening of the scope of the system has been well documented.[1-3] For example, approximately 2.1 million persons were incarcerated on any given day in 2016, and almost 20 million persons had a felony conviction in the United States as of 2010.[3,4] Moreover, expansion of the US penal system has not been uniform; for example, in a study combining administrative, survey, and census data, an estimated 20% of black men born from 1965-1969 had served time in prison by their early 30s compared with only 3% of white men born during the same years.[5]

Building on articles examining the prevalence of incarceration, another literature focuses on the social consequences of mass incarceration. This literature shows the varied and detrimental sequelae of incarceration, which extend beyond incarcerated individuals to their families and to the communities where they live and work upon release from prison.[6] This body of research links incarceration to a multifaceted set of conditions, such as family functioning, employment, wages, and health conditions. The primary objective of this article was to review the literature on health outcomes that are associated with incarceration, including chronic conditions, infectious disease, and mortality. A secondary objective was to examine the potential mechanisms that explain the incarceration–health relationship. We conclude with suggestions on how to move the field forward by calling for further integration of the medical and social science fields.

In addition to assessing research to date on the nature of the incarceration–health association and the explanations for it (eg, Massoglia and Pridemore's review[7]), this article highlights a social science perspective and advocates for uniting medical and social science research in future work. We focused on the physical health of persons who are currently incarcerated or have been incarcerated. For our purposes, exploring the potential effects of incarceration on a partner or child was a separate endeavor.[8-10] We also did not address the linkages between incarceration and community health conditions or emerging research on the mental health consequences of incarceration.[11-13] Because jail stays tend to be shorter than prison stays (ie, days or months vs years) and thus may have different implications for health, we restricted our focus to prisons. More broadly, we oriented our discussion to larger, more general themes in the field. None of these choices reflected a judgment about these research areas;

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rather, they allowed for a more complete and nuanced discussion of our focus. Nonetheless, we were still left with a large literature to consider.

Before we review the literature, a brief methodological note is warranted. It is challenging to establish causal connections between incarceration and health conditions. Incarcerated persons have elevated rates of structural factors consistently associated with poor health, such as poverty, low levels of education, and limited vocational skills.[7] Moreover, incarcerated persons may also have higher levels of behavioral risk factors, such as drug use or exposure to violence, than the general population.[2] Thus, it can be challenging to isolate the effect of incarceration from other cooccurring risk factors. These challenges are often amplified by a lack of longitudinal data, especially on both high-quality health indicators and measures of incarceration. Much research on the relationship between incarceration and health comes from a comparably small number of data sets, which often have been collected for other purposes. Thus, although research on the incarceration–health association has expanded rapidly in recent years, research is still in a nascent stage, and future work will continue to advance our knowledge of this complex relationship.

## The Incarceration–Health Relationship

The incarceration–health relationship comprises a broad range of health conditions linked to incarceration. In a literature review, Massoglia and Pridemore[7] documented a negative relationship between incarceration and a diverse set of health conditions. For example, incarceration is associated with high levels of self-reported chronic conditions,[14] and the experience of incarceration (exposure) generally has a greater effect on health than the length of incarceration.[14,15] Aside from general health conditions such as physical functioning, studies in this area have considered various distinct conditions, including infectious disease, cardiovascular disease, weight gain, hypertension, and cancer.[15-21] In general, incarcerated persons and formerly incarcerated persons have an elevated risk for these chronic health conditions compared with the general population.[7]

Numerous studies have also found a relationship between incarceration and mortality.[20,22,23] From 2001 through 2014, approximately 3000 deaths occurred annually in US state prisons; the leading causes of death were cancer, heart disease, liver disease, respiratory disease, suicide, and AIDS.[24] A study of mortality among incarcerated white and black men in North Carolina from 1995 through 2005 showed similar results; the leading causes of death were cardiovascular disease, cancer, and infections (primarily HIV). During this period, incarcerated white men had a higher mortality rate than nonincarcerated white men in North Carolina.[19]

The elevated risk of poor health conditions and mortality extends beyond prison; studies have found an increased risk of poor health conditions and mortality both immediately after and years after release.[20,21] In general, incarceration is associated with worse health for all formerly incarcerated persons compared with never incarcerated persons; most research finds little variation by race or gender, but some studies indicate otherwise. For example, the incarceration–mortality association generally appears stronger for women than for men and for white persons than for black persons.[20,23,25] That is, women with a history of incarceration have a higher risk of mortality than men with a history of incarceration, and the same applies to white persons compared with black persons. However, incarceration may not always result in poorer health. Some evidence suggests that incarceration may have protective effects on the mortality of young black men; because confinement provides access to basic health care and results in fewer accidental deaths (eg, due to firearms) than in the community, incarcerated black men have a lower mortality rate than nonincarcerated black men.[25]

## Potential Mechanisms

Although many pathways link incarceration and health, we focused on the most prominent pathways identified in the social science literature. Social science research advances our understanding of linkages between incarceration and health by highlighting how inequalities, both preexisting inequalities and inequalities resulting from incarceration, affect the incarceration–health association. These pathways include social integration, reintegration challenges, contagion, and stress. Selection processes (ie, previous poor health) also explain a portion of the incarceration–health association: although incarcerated populations have disproportionately poor health, some incarcerated persons might have had poor health regardless of incarceration. More broadly, these various mechanisms interact with each other to affect health. For example, reintegration challenges have linkages to health because of the economic marginalization incarcerated persons face when released from prison and because of the stress and challenges to social integration caused by this economic marginalization. Although we discuss each mechanism separately, most currently incarcerated persons and formerly incarcerated persons often have multiple risk factors simultaneously. Along similar lines, many of these processes (eg, stress) can apply to processes both inside prison and after release. For example, prison is a stressful environment, and stress is likely heightened as incarcerated persons navigate their lives postrelease. We organized our discussion around the mechanisms themselves and, where appropriate, noted whether the institutional setting or life outside prison was more consequential for the particular mechanism.

Incarceration can act as both an acute stressor (ie, a sudden life-changing event, such as divorce or job loss) and a chronic stressor (ie, a lasting source of hardship, such as deficits in skill or education), each of which has potentially negative health consequences.[15,26-29] Concerning acute stressors, decades of research show that the transition into and out

of prison is traumatic. For example, incarcerated persons have countless adjustments to make when they arrive in prison, such as restrictive sleeping patterns, separation from loved ones, interpersonal conflict, and loss of personal freedom. Changes upon release, such as the disappearance of rigid structure and routines, can also be a source of stress.[30-34]

Incarceration can also act as a chronic stressor.[26] Continual exposure to stress has been found to tax the cardiovascular and immune systems in the general population, increasing individuals' risk of health problems.[27] On average, state prisoners are incarcerated for several years, and most incarcerated persons are exposed to prolonged and repeated stress beyond the acute stress of initially adjusting to confinement.[35] Chronic stressors in prison include experiencing or witnessing violence, navigating the social hierarchy with other prisoners or correctional staff members, and enduring harsh living conditions, systematic overcrowding, or loss of social support.[7,30-33] These and other chronic stressors may cumulatively lower health quality.[26] Previously incarcerated persons may experience chronic stress because of reintegration challenges, including employment, social support, and housing. As a result, research has found that formerly incarcerated persons are more likely than never incarcerated persons to be diagnosed with stress-related illnesses, such as hypertension and heart disease, after adjusting for relevant factors.[15,21]

Incarceration is also likely associated with health conditions through infectious disease. Compared with the general population, incarcerated populations have elevated rates of infection with tuberculosis, HIV/AIDS, hepatitis, sexually transmitted diseases, and *Staphylococcus aureus*.[36-39] For example, in 2006, the rate of hepatitis C infection was 8.7 times higher among incarcerated individuals (17.4%) than among the general population (2.0%).[38] However, many of these diseases are present at prison intake. In other words, a portion of infectious disease transmission occurs before incarceration, because incarcerated persons have elevated rates of injection drug use, unprotected sex, poverty, and poor health before being incarcerated.[40-43] Contagion effects, or the effects of close living quarters in confinement, help explain why incarceration is associated with infectious disease after adjusting for previous health.[7] In addition, unprotected sex and injection drug use inside prisons help spread infections.

Incarceration may also influence health by impeding social integration. At the most basic level, the act of incarceration removes persons from families and support systems. This problem may be even more acute for incarcerated women who often face confinement further from their families than their male counterparts because of the comparatively smaller number of female institutions.[44] Hence, a well-established literature finds that currently incarcerated persons have higher rates of divorce, lower rates of marriage, and a greater likelihood of damaged or strained relationships with their children than non-incarcerated persons.[45-49] The immediate and sudden removal of support systems, including support that may come from a job or school involvement, and the accompanying social isolation, have potential implications for health, including morbidity and mortality.[50-54]

Reintegration has its own challenges for formerly incarcerated persons, such as difficulty finding housing and employment and reestablishing relationships with family and friends (ie, social support). For example, if marital dissolution did not occur during incarceration, years of separation can make reintroduction to everyday family life challenging.[48,55] As such, incarceration may also affect health because social support can mitigate the effect of stress on one's health, but incarceration damages social ties and support postrelease.[56]

The reintegration process may also affect health because of the economic marginalization incarcerated persons face upon release. The causes of this economic marginalization can be multifaceted, including human capital deficits resulting from being incarcerated (eg, work experience and skill deficits), financial hardship caused by monetary sanctions (ie, court costs, fees, and fines), and laws that restrict economic opportunities for persons convicted of a felony (ie, collateral consequences).[1,2,46,57] For example, most states have laws that prevent persons convicted of a felony from working in certain segments of the labor market (eg, jobs that require licenses, such as barbers and public sector employment), and federal legislation bans persons convicted of a felony from receiving subsidized loans for education.[1] In addition, formerly incarcerated individuals may face discrimination from employers. Potential employers generally know little else about an applicant beyond the individual's criminal record, which is often associated with negative stereotypes.[58] Studies show that formerly incarcerated persons are less likely to be hired than never incarcerated persons, and when they are hired, they face wage stagnation.[2,58] In addition, when formerly incarcerated persons are employed, they tend to work in predominantly low-wage, manual labor jobs that are unstable and offer few benefits.[2,34] Employer-sponsored health insurance programs are the most common way working-age persons in the United States obtain health insurance.[59] Jobs for formerly incarcerated persons, however, rarely provide such benefits.[2] Inadequate insurance combined with job instability disrupt continuous health care and predict poor health, which is particularly problematic for formerly incarcerated persons given their elevated rates of health issues.[60,61]

In addition to family and employment difficulties, formerly incarcerated persons may have substantial housing insecurity. For example, formerly incarcerated men often have unstable residential patterns characterized by frequent moves, missed monthly rent payments, and stays with family or friends without paying rent.[62,63] They also are more than twice as likely as never incarcerated men to be homeless.[63] Legal restrictions contribute to these difficulties because federal law bans persons convicted of drug-related offenses from living in public housing.[63] Housing instability,

including mobility, insecurity, and homelessness, is associated with poor health through stress processes.[64,65] Thus, elevated levels of housing insecurity among formerly incarcerated persons may affect morbidity and mortality.

Civic participation is another key avenue for reintegration, but some state and federal laws ban persons convicted of a felony from such involvement.[1] For example, many states and communities bar convicted felons from voting, serving on a jury, running for public office, or volunteering for community organizations.[1] Although formerly incarcerated persons may express a desire to become active community members, not being able to fully integrate into one's community has health implications. Studies have found that persons engaged in their communities have higher levels of physical functioning and lower levels of mortality than persons who are not engaged in their communities.[66-68] Consequently, laws that prohibit formerly incarcerated persons from engaging in their communities may affect their health.

## Positive Effects of Incarceration

Although many studies have found that incarceration has negative effects on health, some studies show a net positive relationship for some demographic groups.[25] Conditions of confinement can lead to a decrease in risk factors for some groups. For incarcerated persons who are low income or who live in violent neighborhoods, conditions of confinement (eg, regular meals, heated living areas) may be an improvement over residential circumstances outside of prison and thus offer some potential health benefits (eg, better health functioning and lower mortality). In particular, incarcerated young black men are at a lower risk of death by accident or homicide than nonincarcerated young black men, which lowers their overall mortality rate.[25] In addition, incarceration may remove some women from corrosive relationships or provide access to preventive medical care, which can lead to improved health conditions.[59] Any health benefits of incarceration are contingent on the realities of US inequality (ie, that some demographic groups are more disadvantaged than others). However, for some groups, incarceration leads to a net improvement in some health-related conditions, treatments, or risk factors.

## Integrating Medical Research and Social Science Research

The integration between medical research and social science research is essential to moving the literature forward. Our sociological approach to the study of the incarceration–health association benefited from the work of researchers from other disciplines.[21,22,69,70] Insight from the medical field caused us to reconsider several fundamental assumptions in social science research.

Consider the use of self-reported measures, a staple of social science research that has its limitations. For example, social desirability and recall error may influence the reporting of a range of behaviors, including health or health-related behaviors (eg, substance use). Despite these limitations, research using self-reported measures is common and shows that formerly incarcerated persons score substantially worse on many self-reported health conditions postrelease than never incarcerated persons.[14,15,26]

An implicit assumption in research using self-reported measures is that being incarcerated increases the risk of poor health through the mechanisms outlined in this article. On the other hand, incarceration may cause persons to be more aware of and better informed about their health problems than if they had never been incarcerated. Incarcerated populations tend to be low health care users before entering the prison system.[14] Therefore, incarceration intake procedures that increasingly include physical examinations may alert incarcerated persons to previously undiagnosed health conditions. Thus, the association between incarceration and health problems may be due, at least in part, to incarcerated persons having more information about their health status than their non-incarcerated peers.

One way to address this threat to causal inference is to integrate, beyond self-reported measures of health, standardized measures of health (eg, blood pressure). A physical examination at intake and exit, along with intermediate monitoring and testing that includes blood tests, could potentially have seismic effects on our understanding of the incarceration–health association. We could, for example, better understand patterns of disease among incarcerated persons, track institutional transmissions, and examine stress processes by using cortisol tests. More generally, multimethod data collection that targets incarcerated persons' health when they enter the system, includes a series of checks during incarceration and postrelease, and uses standardized measures (eg, blood pressure) and self-report questions (eg, health functioning) could help researchers better understand how to improve the health of currently incarcerated persons and formerly incarcerated persons.

A medical perspective on health highlights our knowledge gaps. For example, studying infectious disease in prison is important to understanding and potentially disrupting the incarceration–health relationship. Yet, data on precise estimates of the prevalence of infectious diseases in the correctional population are lacking. Similarly, although this article discusses general mechanisms, the empirical work to date has shown only that incarceration affects health rather than specifying which mechanisms are most consequential, for whom, and under what conditions.

Integrating results and findings from the social sciences and medicine could move our understanding of the incarceration–health association forward. Social science research in particular can shed light on how social patterns of organization, including inequality, contribute to both medical assessments and self-reported findings. Similarly, continued cross-disciplinary research is well suited for advancing our understanding of how large-scale health-promoting programs, such as the Patient Protection and

Affordable Care Act, condition the incarceration–health relationship.[7] Future research on the intersection of social and medical science promises to be the most exciting and transformative on this topic.

## Policy Recommendations

One way to reduce health problems among incarcerated persons is to provide better medical care both in prison and during transition to the community postrelease.[59] Even small improvements in care, such as the increased availability of health care services, preventive treatments, or even postrelease health care monitoring as part of release conditions, could have large health benefits. In addition, improving the conditions of confinement (eg, reducing overcrowding) may benefit health. Finally, reducing the barriers to reintegration could have a positive effect on the health of formerly incarcerated persons. Most comprehensive reentry programs are small-scale efforts, often run by grassroots or advocacy organizations. Expanding these and other evidence-based programs more broadly can improve health. Relatedly, another way to facilitate reintegration would be to ease collateral consequences—laws that ban formerly incarcerated persons from fully participating in society. Most of these legal sanctions are not grounded in research, and a compelling argument can be made that they do more harm than good.[1] Developing and implementing correctional programs and policies that are grounded in medical and social science research offer the potential to improve both individual and population health.

## Conclusion

A burgeoning literature indicates a negative relationship between incarceration and health. However, research has only begun to untangle the complex pathways linking incarceration and health inside and outside of prison. Given the complexity of these pathways, more research is needed to better understand them. With approximately 641 000 persons released yearly from prisons, the cumulative number of formerly incarcerated persons in society continues to grow.[4,71] As such, understanding the linkages between incarceration and health, and which policy interventions and levers can reduce the health deficits of incarcerated persons, will be important for future research.

### Authors' Note

Both authors contributed equally to this article.

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