Journal of
Community & Public Health Nursing
Case Report Open Access

# Incarceration as a Social Determinant of Health

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**Abstract**

The Incarceration is not considered a social determinant of health (SDH), but further investigation on the topic will prove otherwise. The social determinant of health identified for this paper is being a former incarcerated individual from a low socioeconomic (SES) community and the health outcome is barriers to access to healthcare post-release from jail or prison. While low socioeconomic status is a culture as well as a well-recognized SDH, incarceration is not typically thought of in this way. Therefore, when we couple the culture of low SES and the prison culture, we can see start to think about incarceration as a rather complex SDH.

**Keywords:** Incarceration; Community; Socioeconomic; Prison culture

## Introduction

The following definitions will help to elaborate more on why we should think of incarceration as a culture. According to Healthy People 2020, "examples of social determinants include culture" [1]. The Merriam Webster dictionary defines culture as "the set of shared attitudes, values, goals, and practices that characterizes an institution or organization" [2]. If we can think about status of incarceration as a culture, then we can start to see it as an SDH. It comes with a set of its own attitudes, roles, behaviors, beliefs, and values. For example, the prison culture has a hierarchy that is inverted from what mainstream society maintains, in which they exalt those who have committed the most convicting of crimes [3]. Population television shows depict this phenomenon. In another example, a person in prison for petty theft would be at the bottom of the hierarchy while someone who is an infamous mob king or has done something to earn respect in the criminal world, such as killing a police officer, will dominate the hierarchy.

The prison culture also has its own set of norms, stigmas, and stereotypes. Moore et al states that stigmas exist on three levels: structural, social, and self. Through the interactions between structural stigmas such as institutional barriers, social stigmas such as stereotypes and discrimination, and self-stigmas which are individual responses to these factors [4], it becomes difficult for prisoners during post-release to re-assimilate back into society and reclaim the standards of living that they had prior to incarceration. The complexity of this process is exacerbated if these individuals came from low SES backgrounds, as they are predisposed to adverse health outcomes and are less likely to obtain the needed help once released. Upon re-entry, these stigmas are translated into a continuous cycle of poverty and poor health [5]. They are accompanied by a lack of a social support system, as well as a lack of medical support due to the difficulty these individuals have obtaining jobs – much less obtaining a job with benefits such as health insurance.

One of the biggest issues with incarcerated individuals is that many of them have chronic illnesses may have developed prior to incarceration that there were unaware of and they need medical care. Setting stigmas aside, this then creates a cohort of individuals that are in dire need of medical assistance for chronic illness such as mental health issues, HIV/AIDS, substance-dependence, diabetes, and hypertension [6]. While some states have policies in place that ban former inmates from receiving aids like food stamps, certain student financial aids, and public housing [5], there are other states with mechanisms in action to help former inmates. For instance, the Bronx Transition Clinic works closely with Montefiore Medical Center and the Osborne Association to correct these health disparities. They do this by providing a medical home with open access, having community health workers help former inmates to navigate healthcare, and linking and retaining those with chronic health conditions to primary care within two weeks of release [7]. The importance of retaining these individuals in primary care is because the efforts to link them to care post-release is futile if they do not take advantage of the help offered and continue to remain in the care provided.

## Methods

This paper will review articles that show how the various characteristics of stigma have a great deal of influence over society and inmates. It will become evident that these influences orchestrate how incarcerated individuals should behave and determine which "rights" they have as they attempt to re-assimilate themselves into society, whilst coping with competing health issues.

## Results

To continue with the examination of how stigmas influence the behaviors of society and formerly incarcerated individuals, we look at a study by Moore et al. In this longitudinal study, 168 jail inmates who were prior to release reported perceptions of stigma toward criminals and anticipated stigma. This was coupled with a survey assessing stigmatizing attitudes toward criminals completed by a diverse college population. Data was collected from the jail and sampled at three times: shortly after their entry to jail, shortly before release time, and one year post-release. The inmate pool was comprised mainly of African Americans, followed closely by Caucasians. Data obtained in the surveys had information on the perceived and anticipated stigmas of inmates, employment status before incarceration, and self-reported recidivism. For the community sample, 597 undergraduate students were selected from a diverse college, accurately representing the demographics of the surrounding community, which was 60% Caucasian. The sample completed a survey on public stigma, using the 7-point Likert scale. The data concluded that inmates' perceived stigma was not strongly correlated with anticipated stigma, although it was significantly higher, with an SD of 1.22. The reason suggested for this was that despite the large amount of stigma aimed at criminals, the inmates did not expect to be personally stigmatized. In addition, perceived and anticipated stigma were unrelated to age, years of education completed, employment status,

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**Received** June 22, 2021; **Accepted** July 30, 2021; **Published** August 06, 2021

**Citation:** Baksh A (2021) Incarceration as a Social Determinant of Health. J Comm Pub Health Nursing 7: 298.

and reason for recidivism. Although, those who were younger and employed before incarceration were more likely to find employment within the first year post-release, with no main differences between races. Regarding recidivism, inmates were more likely to have a violent reoffended in their first year post-release if they had higher perceptions of stigma. Finally, when compared to the community sample survey, the inmates' perceived stigma was significantly higher (M = 4.30, SD = 1.21) than the community's stigmatizing attitudes (M = 2.99, SD = 1.09) [7].

A study examined how inmates' social relations either enable or inhibit their adherence to anti-retroviral therapy (ART), which is the treatment, for people living with HIV (PLH). For this study, the inmates also had underlying substance use disorders and were in the stages of transitioning to the community [8]. The three themes anticipated to be indicators or social relationships post releases were self-reported family, friends, and clinicians. With a sample of N=30, the study used qualitative interviews to understand which factors were barriers and which were facilitators to ART adherence when post-release. It was found that those with robust family networks, supportive friends, and clinicians with positive symmetrical relationships would promote ART adherence. Unfortunately, many individuals faced social isolation due to criminal, drug, and HIV histories. Families were either unequipped to help the former inmates or they ostracized them, while the friends that would remain were those that enabled drug use. Additionally, clinicians were perceived as dismissive, which undermined trust.

Swan (2014) studied the barriers to continuous HIV care post-release. With a sample of N=25, face-to-face semi-structured interviews were conducted with former inmates that were HIV-positive and had a history of drug use [9]. The majority of participants reported having other health problems. It was concluded that drug use was reported to be a barrier to HIV treatment, and upon cessation of drug use, participants were motivated to begin their HIV therapy. A few common reasons for relapsing to drug use were recidivism, attribution of adverse symptoms of HIV to drug use, triggers in social life facilitated relapse, immediate relapse post-release, and having a mental health disorder.

In a randomized control trial, Ramaswamy M & Freudenberg N analyzed the effects of sexual partnerships on health and social risks of young Black and Latino men ages 16-18 who were leaving jail [10]. The participants, N=552, were selected from the parent study called REAL MEN. Both romantic and non-romantic sexual relations were identified as influencing participants' choices in sex, drugs, crime, and education. The study aimed to examine sexual partner experiences three months prior to initial incarceration and one year post-release. The results showed that young men who had long-term sex partners prior to incarceration were less likely to be inconsistent condom users (OR = 0.50, $p \leq 0.01$), have sex while high on drugs or alcohol (OR = 0.14, $p \leq 0.001$), use marijuana daily (OR = 0.45, $p \leq 0.001$), and carry weapons during illegal activity (OR = 0.58, $p \leq 0.05$). Confounding factors that influenced whether these young men would have positive or negative outcomes were employment status and house stability. Additionally, the patterns in sex partners change over time due to the course of normal adolescent development and the disruptive effect of incarceration (Table 1).

Another study looked at the various health priorities of women who were recently released from jail [11]. In this sample of N=28, the women were selected from a larger study and participated in semi-structured interviews. Three main themes were identified as relating to their prioritization of health post-release: their competing priorities post-release; expressed reasons for health being a low priority; and the context in which women were actually using the healthcare system. The first priority for most women was securing employment, followed by housing and their children. The material needs competed with their personal health needs. Some identified barriers as to why women placed their health needs as such low priority were: low perception of susceptibility to disease, behavioral and policy barriers linked to past drug use, in addition to the concrete barriers of lack of money, health insurance, and transportation.

A study by Salem et al (2013) took a sample of N=14 females on probation or parole living in a residential drug treatment (RDT) facility for at least 2 weeks [12]. They conducted a descriptive, qualitative study to understand the distinct gendered experiences of homeless female ex-offenders in the context of healthcare needs, types of health services sought, and gaps in order to help them attain an easier transition during post-release. The majority of the participants were African American (79%), followed by whites and then Hispanics. Most had children, but few were involved in intimate relationships. Through the study, it was discovered that intimate partner violence (IPV) was a significant event in the lives of incarcerated women. In addition, women are more likely to be incarcerated for drugs than anything else. The study also indicated that women expressed the need to learn new skills, obtain supplementary resources, and have secured a post-residential care facility in order to maintain their sobriety and prevent recidivism. Some additional challenges that were cited were: lack of transportation, lack of insurance, knowledge deficit in regard to prevailing healthcare issues, and long wait times. The women claimed that were unable to obtain dental, mental health, and sexual health care. The participants believed that lack of access to healthcare was due to inability to make appointment, possibly due to the accumulation of factors such as lack of transportation, inadequate funds, and general knowledge deficits. Additionally, having a successful re-integration and eligibility for health insurance were hindered by not having adequate identification or proof of residence. Another barrier was inadequate support staff at the RDTs. The women disclosed that they would rather have clinicians, nurses, and psychologists to direct health care discussions and provide health education information sessions. Finally, it was found that hotlines were essential to preventing recidivism and relapse, especially when these women had no other means of support.

Fox et al. conducted a retrospective cohort study with a sample of N=135 to investigate health care delivery and outcomes for recently released inmates who were receiving care at the Bronx Transition Clinic, which was discussed earlier [4]. The main measures of care delivery were access to and retention in care. The health outcomes of interest were for four common chronic diseases that typically require routine follow-ups: HIV, opioid dependence, hypertension, and diabetes. The study found that the involvement in these transition clinics were helpful in reducing the reliance on emergency departments for health care services. More than 70 of the participants were seen within two weeks of their release. However, fewer than half of patients retained medical care after six months, and many failed to achieve optimal outcomes for chronic disease. For participants with HIV, cessation of treatment could lead to the development of viral resistance and even increase in transmission in the communities. For participants with diabetes, glycemic control is difficult because it is not feasible or affordable to adhere to medication management and dietary restrictions. For participants who were substance users, their tolerance is drastically reduced during their incarceration periods and relapsing post-release often leads to vulnerability to overdose. The study also found that confounding factors such as depression and other mental health issues could be reasons for lack of retention to care. An interesting finding was that health outcomes were better

| Summary of Articles | | | | |
|---|---|---|---|---|
| **Title** | **Author, Year** | **Objective** | **Population, Setting** | **Results** |
| Jail Inmates' Perceived and Anticipated Stigma: Implications for Post-release Functioning | Moore, K., Stuewig, J., & Tangney, J. (2013) | To understand the nature and implications of offenders' stigma | Inmate Sample (N=168); Community Sample (N=597) | Inmates' perceived stigma was significantly higher than the community's stigmatizing attitudes |
| Effect of social relationships on antiretroviral medication adherence for people living with HIV and substance use disorders and transitioning from prison | Rozanova, J., Brown, S. E., Bhushan, A., Marcus, R., & Altice, F. L. (2015) | To examine how inmates' social relations either enable or inhibit their adherence to anti-retroviral therapy (ART) | (N=30) inmates also had underlying substance use disorders and were in the stages of transitioning to the community | Those with robust family networks, supportive friends, and clinicians with positive symmetrical relationships would promote ART adherence |
| Different Patterns of Drug Use and Barriers to Continuous HIV Care Post-Incarceration | Swan, H. (2014) | To study the barriers to continuous HIV care post-release | (N=25) former inmates with history of drug use | Upon cessation of drug use, participants were motivated to begin their HIV treatment |
| Sex partnerships, health, and social risks of young men leaving jail: analyzing data from a randomized controlled trial | Ramaswamy, M., & Freudenberg, N. (2010) | analyzed the effects of sexual partnerships on health and social risks | (N=552) young Black and Latino men ages 16-18 leaving jail | Young men who had long-term sex partners prior to incarceration were less likely to be inconsistent condom users, have sex while high on drugs/alcohol, use marijuana daily, and carry weapons during illegal activity; confounding factors were employment status and house stability |
| Health Priorities among Women Recently Released from Jail | Ramaswamy, M., Upadhyayula, S., Chan, K. Y. C., Rhodes, K., & Leonardo, A. (2015) | To look at the various health priorities of women who were recently released from jail | (N=28) women were selected from a larger study and participated in semi-structured interviews | Identified barriers as to why women placed their health needs as such low priority were: low perception of susceptibility to disease, behavioral and policy barriers linked to past drug use, as well as the practical barriers of lack of money, health insurance, and transportation |
| At a Crossroads: Reentry Challenges and Healthcare Needs among Homeless Female Ex-Offenders | Salem, B. E., Nyamathi, A., Idemundia, F., Slaughter, R., & Ames, M. (2013) | To understand the distinct gendered experiences of homeless female ex-offenders in the context of healthcare needs, types of health services sought, and gaps | (N=14) females on probation or parole living in a residential drug treatment (RDT) facility for at least 2 weeks | Intimate partner violence (IPV) was a significant event in the lives of incarcerated women; additional challenges that were cited were: lack of transportation and insurance, knowledge deficit in regard to prevailing healthcare issues, and long wait times |
| Health outcomes and retention in care following release from prison for patients of an urban post-incarceration transitions clinic | Fox, A. D., Anderson, M. R., Bartlett, G., Valverde, J., Starrels, J. L., & Cunningham, C. O. (2014) | To investigate health care delivery and outcomes for recently released inmates who were receiving care at the Bronx Transition Clinic | (N=135) | The involvement in these transition clinics were helpful in reducing the reliance on emergency departments for health care services |
| Health Disparities and the Criminal Justice System: An Agenda for Further Research and Action | Binswanger, I. A., Redmond, N., Steiner, J. F., & Hicks, L. S. (2012) | To investigate health disparities and the criminal justice system | N/A | Minority groups that are at risk for poor health outcomes can largely benefit from health screenings and care that are provided by prisons, which can have an impact on health care disparities among races/ethnicities |
| A description of an urban transitions clinic serving formerly incarcerated persons | Fox, A. D., Anderson, M. R., Bartlett, G., Valverde, J., MacDonald, R. F., Shapiro, L. I., & Cunningham, C. O. (2014) | To review of electronic medical records of recently released prisoners | (N=266) retrospective cross-sectional study of recently released from prison | Fear of stigma had no impact on clinical care but common barriers to care were cost and provider availability |
| Making Ends Meet After Prison | Harding, D. J., Wyse, J. J., Dobson, C., &Morenoff, J. D. (2014) | To examine their processes by which they attained economic security and met basic material needs whilst achieving upward mobility over time after release from prison | (N=22) former prisoners | Barriers identified were legal and policy restrictions on former offenders, such as bans from food stamps, SSI, and public housing |

**Table 1:** Summary of Articles.

for HIV-positive participants and can be attributed to the fact that New York City has more housing subsidies availabilities to homeless HIV-infected individuals, relieving them of one burden so they can begin to prioritize their health needs.

Binswanger et al. investigated health disparities and the criminal justice system. It notes that racial and ethnic minority groups such as African Americans, Latinos, and American Indians receive worse care and have more adverse outcomes than whites [13]. Moreover, they are more likely to experience incarceration than whites. Given this demographic information, these minority groups that are at risk for poor health outcomes can largely benefit from health screenings and care that are provided by prisons, which can have an impact on health care disparities among races/ethnicities. Further research needs to be done in order to assess the quality of the health care given in correctional facilities. This article identified four points along the criminal justice continuum to help mitigate health disparities. The first is upon entry into the correctional system, where health providers can provide health screenings. The second is during custody to promote health and prevent disease while managing any medical conditions. The third is during the transition from prison into the community by coordinating health services, access to health care, and ensuring the timely reinstatement of insurance. The fourth is during subsequent community supervision, which would include targeted health screening programs and follow-ups for specific health issues that were identified during incarceration. Thus, while health care within prisons are adequate, further interventions need to be implemented with proper coordination efforts to link inmates to care upon re-entry.

In a retrospective cross-sectional study by Fox et al., a review of electronic medical records was conducted for a sample of N=266 individuals who were recently released from prison [4]. The sample was mainly Hispanic, followed by blacks, with most of them having Medicaid and over 200 having more than one chronic health condition. It was found that fear of stigma had no impact on clinical care but that common barriers to accessing care were cost and provider availability. Other cited challenges were mental health services, physician coverage, and provision of transportation. However, even with discharge planning, 30% of the participants still lacked health insurance. Future actions to increase access to and retention of care would entail incorporating community health workers, reducing stigmas, and having flexible scheduling.

In the final study by Harding et al., a sample of N=22 former prisoners was used to examine their processes by which they a In a randomized control trial, Ramaswamy attained economic security and met basic material needs whilst achieving upward mobility over time after release from prison [14]. It was found that employment was not enough to establish economic security, with other forms of material support needed as supplements, such as social ties and access to long-term public benefits. Barriers identified were legal and policy restrictions on former offenders, such as bans from food stamps, SSI, and public housing. Most of these restrictions apply to drug offenders, which mean that mostly female offenders are disproportionately affected by these restrictions. In sum, the study found that stigmas and these legal restrictions were the largest barriers to making ends meet during post-release.

## Discussion

In sum, the articles have the same recurring main themes. The first is that chronic health conditions such as diabetes, hypertension, HIV, and substance use disorders are overrepresented in the incarcerated populations and often not followed up with consistent healthcare after re-entry. The second theme is that formerly incarcerated individuals face barriers to access healthcare due to competing priorities that prevent them from seeking healthcare, such as: securing housing, re-establishing relationships, finding employment, and attending regular parole meetings. Even if these priorities are regained, the fact that remains of most of the time these former prisoners still have no health insurance or means of transportation to access the healthcare (Figure 1).

The third theme is that because a large majority of the incarcerated population come from underserved communities, healthcare within the correctional system may be the only medical care available to them. Thus, many of these individuals may have been first diagnosed with health issues upon their incarceration. However, because they will return to their low SES communities upon release, there are unlikely odds of them ever re-attaining proper healthcare. The issue lies here, in the lack of linkage to care in the community post-release. HIV is a prime example of a chronic infectious disease that is prevalent in low SES communities and is also overrepresented in incarcerated populations. It has been noted in several of the studies that HIV treatment within correctional facilities has shown positive health outcomes. Yet, community reentry has shown disruptions in anti-retroviral therapy treatment (ART), with increases in HIV viral overload and decreases in CD4 count. Some attributing factors to the cessation of seeking healthcare are competing priorities and the belief that symptoms are due to their substance use disorder rather than HIV (Figure 1).

The fourth theme is that incarceration can be used as an opportunity to receive health screenings, prevent, and treat any health condition. However, long-term planning for discharge should begin

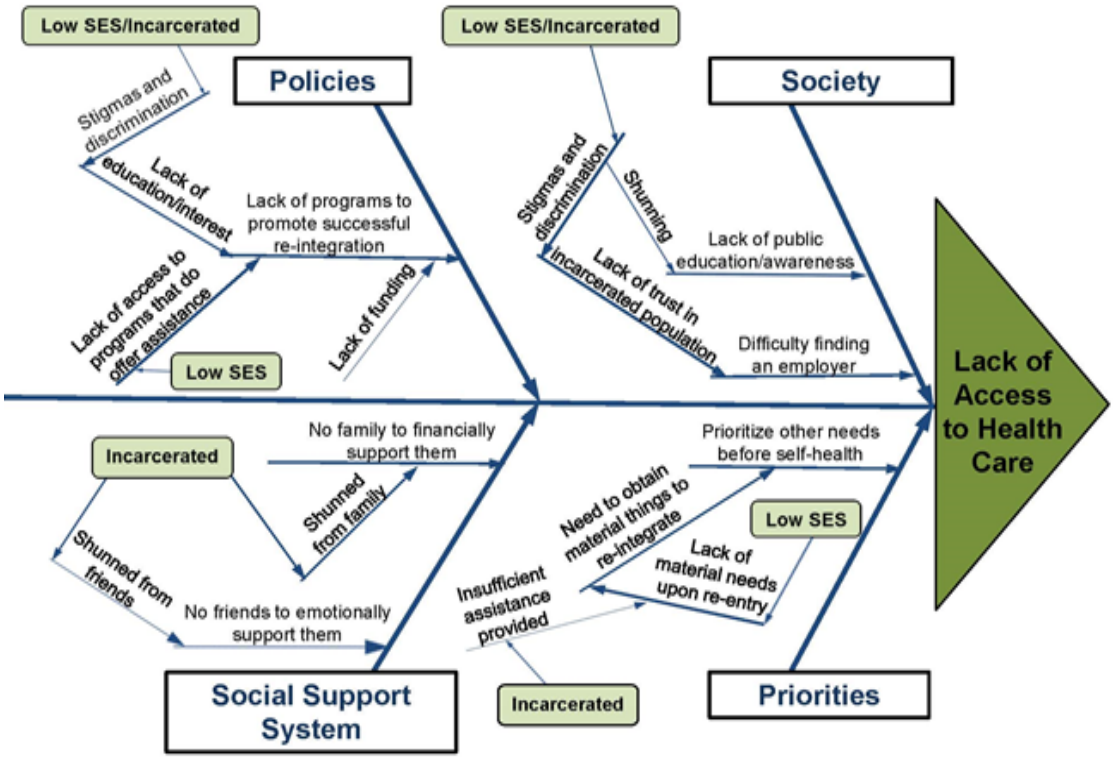


**Figure 1:** Fishbone diagram showing health outcome of lack of access to health care for recently incarcerated individuals from low socioeconomic backgrounds post-release.

upon admission and the process to link inmates to care upon release should begin as soon as they are introduced to the prison system and are identified as having health issues. The long-term benefit of this is that these individuals are healthier and have one less burden so they can focus on their other priorities to prevent recidivism (Figure 1).

The fifth theme is that the involvement in transition clinics and residential drug treatment facilities can help recently released individuals decrease reliance on emergency departments and hospitals to seek health care. Unfortunately, the transition clinics are limited in that they mainly focus on care utilization, substance use, and re-incarceration. This omits the care of chronic diseases and the essential needs required to obtain optimal health outcomes long term (Figure 1).

Through a phenomenon known as the revolving door, more than 40% of those released return to prison within three years. With the main reason for this being unsuccessful re-integration. If programs and policies can be implemented to link these released inmates to health care upon reentry, this would be beneficial to their health because we have seen how personal health needs are a low priority for these individuals when attempting to reintegrate into society.

However, even if these modifications to the system can be made, the main obstacle remains within society. For instance, employers maintain certain expectations of ex-offenders, such as lacking soft skills, tending to clash with other employees, and proving to be unreliable in the handling of cash and goods. These stigmas and discriminations are more prevalent and are intensified for African American men, who face exacerbated racial stereotypes once they have a felony record (Figure 1). As stated before, all incarcerated individuals deal with stigmas and discrimination upon release, but those of low SES backgrounds are predisposed to not only having a history of discrimination but are more likely to experience new ones.

In addition to trying to reintegrate into society, these individuals also have to learn how to cope with these new stigmas and stereotypes in order to overcome the barriers presented them while trying to secure employment, acquire housing, earn money, obtain health insurance, and reestablish social ties. Once policies can be implemented to help these recently released prisoners acquire healthcare, especially those with chronic health issues that require medical follow-ups, we can relieve these individuals of burden, and also implement new policies to assist them in acquiring either temporary jobs or housing (Figure 1).

## Conclusion

The Whitehead typology describes four levels of action that can be taken to address health inequalities. The first level pertains to strengthening individuals, where there needs to be an infusion of optimism and hope for these recently released incarcerated people who return to low SES communities. This action would take place in prison prior to release. Strengthening of the community would mainly consist of breaking down stigmas and preventing discrimination. This can be done through educating the community on the complications and hardships faced by those involved in the criminal justice system. Public health policies would be used guide the improvement of living and working condition, such as policies to provide temporary housing and jobs to those recently released in order to relieve them of a few worries so that they can prioritize their health needs. Another possibility for a public health policy would be to give these individuals health insurance upon reentry so that they can address their health needs. To promote macro-policies with nationwide education, an idea would be to include the incarcerated population when educating the public on national days that commemorate other diseases. For instance, on national HIV testing day, education can be provided to the public on the rates of HIV within this particular population and also the complications they face when attaining their follow-up care post-release.

### Consent for Publication

The author gives consent for publication with The Open Public Health Journal.

### Funding

The author declares no funding.

### Conflict of Interest

The author declares no conflict of interest, financial or otherwise.

### Acknowledgment

I acknowledge Dr. Ralph J. Di Clemente of New York University for his support and assistance in guiding helpful discussions to conduct this research.

### References

1. Social Determinants of Health (2016) Retrieved from https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health.
2. Merriam-Webster Dictionary (2016) Retrieved from http://www.merriam-webster.com/dictionary/culture.
3. Prisons: Prisoners - Inmate Subcultures and Informal Organizations - Inmates, Gang, and Roles Retrieved from http://law.jrank.org/pages/1796/Prisons-Prisoners-Inmate-subcultures-informal-organizations.html#ixzz4RdSLwxGQ
4. Moore K, Stuewig J, Tangney J (2013) Jail inmates' perceived and anticipated stigma: Implications for post-release functioning. Self and Identity 12: 527-547.
5. Long, Rebecca (2014) Incarceration as a Social Determinant of Health. Health Begins.
6. Fox AD, Anderson MR, Bartlett G, Valverde J, MacDonald RF, et al. (2014) A description of an urban transitions clinic serving formerly incarcerated persons. J Health Care Poor Underserved 25: 376.
7. Fox AD, Anderson MR, Bartlett G, Valverde J, Starrels JL, et al. (2014) Health outcomes and retention in care following release from prison for patients of an urban post-incarceration transitions clinic. J Health Care Poor Underserved 25: 1139.
8. Rozanova J, Brown SE, Bhushan A, Marcus R, Altice FL (2015) Effect of social relationships on antiretroviral medication adherence for people living with HIV and substance use disorders and transitioning from prison. Health Justice 3:1.
9. Swan H (2014) Different patterns of drug use and barriers to continuous HIV care post-incarceration. J Drug Issues. 45: 38-52.
10. Ramaswamy M, Freudenberg N (2010) Sex partnerships, health, and social risks of young men leaving jail: analyzing data from a randomized controlled trial. BMC Public Health 10: 1.
11. Ramaswamy M, Upadhyayula S, Chan KYC, Rhodes K, Leonardo A (2015) Health priorities among women recently released from jail. Am J Health Behav 39: 222-231.
12. Salem BE, Nyamathi A, Idemundia F, Slaughter R, Ames M (2013) At a crossroads: Reentry challenges and healthcare needs among homeless female ex-offenders. J Forensic Nurs 9: 14.
13. Binswanger IA, Redmond N, Steiner JF, Hicks LS (2012) Health disparities and the criminal justice system: an agenda for further research and action. J Urban Health 89: 98-107.
14. Harding DJ, Wyse JJ, Dobson C, Morenoff JD (2014) Making ends meet after prison. J Policy Anal Manage 33: 440-470.