

UCSF

UC San Francisco Previously Published Works

Title

Health Information Seeking Behaviors in Prison: Results From the U.S. PIAAC Survey

Permalink

<https://escholarship.org/uc/item/8kk605z4>

Journal

Journal of Correctional Health Care, 28(2)

ISSN

1078-3458

Authors

Novisky, Meghan A
Schnellinger, Rusty P
Adams, Richard E
et al.

Publication Date

2022-04-01

DOI

10.1089/jchc.20.04.0024

Peer reviewed



Open camera or QR reader and scan code to access this article and other resources online.

RESEARCH PAPER

Health Information Seeking Behaviors in Prison: Results From the U.S. PIAAC Survey

Meghan A. Novisky, PhD,^{1*} Rusty P. Schnellinger, PhD,² Richard E. Adams, PhD,² and Brie Williams, MD³

Abstract

Distinct challenges exist in the delivery of medical services in correctional facilities, yet little is known about the sources of health information incarcerated patients rely upon to understand and manage their health. Using a nationally representative sample of U.S. incarcerated adults ($N = 1,319$) from the Programme for the International Assessment of Adult Competencies, we examine patterns in health information seeking behavior. We find incarcerated persons report television (72.9%) and social contacts (61.8%) as their most common sources of health information and use of magazines and books/brochures is significantly related to better health. We argue that asking incarcerated patients how they get health information and using this knowledge to provide them with health information in formats they will use are important steps toward reducing incarcerated individuals' health disparities.

Keywords: incarceration, health, prison, health behaviors, PIAAC

Introduction

At year-end 2017, 1,489,400 adults were incarcerated in prisons across the United States, including 606,600 new prison admissions (Bronson & Carson, 2019). In the same year, nearly three-quarters of a million adults were confined in U.S. jails on any given day (Zeng, 2019). The sheer volume of people who experience incarceration each year in the United States, coupled with the links between population health outcomes and incarceration (Wildeman, 2016), means that improved correctional health care is critical to improving the nation's overall public health.

Over the past decade in particular, scholars have called for increases in harm reduction strategies in carceral settings (Brinkley-Rubinstein *et al.*, 2017; Moazen *et al.*, 2018; Tran *et al.*, 2018), implementation of more proac-

tive health measures during incarceration (Pont *et al.*, 2015; Rich *et al.*, 2014; Walsh *et al.*, 2014; Wilper *et al.*, 2009) and postrelease (Lorvick *et al.*, 2015), and higher standards in correctional health care (Rich *et al.*, 2015).

These strategies reflect the fact that incarcerated patients experience disproportionate rates of health conditions (for reviews see Massoglia & Pridemore, 2015; Wildeman & Muller, 2012). These include heightened risks of infectious diseases (Massoglia, 2008a; Moazen *et al.*, 2018), worse mental health (Porter & DeMarco, 2019; Porter & Novisky, 2017; Schnittker *et al.*, 2012; Turney *et al.*, 2012), and chronic illness (Binswanger *et al.*, 2009; Wang *et al.*, 2017; Wilper *et al.*, 2009).

Incarcerated populations also suffer from health disparities related to foodborne illnesses (Marlow *et al.*,

¹Department of Criminology, Anthropology, and Sociology, Cleveland State University, Cleveland, Ohio, USA.

²Department of Sociology, Kent State University, Kent, Ohio, USA.

³Division of Geriatrics, School of Medicine, University of California, San Francisco, San Francisco, California, USA.

*Address correspondence to: Meghan A. Novisky, PhD, Department of Criminology, Anthropology, and Sociology, Cleveland State University, 2121 Euclid Ave., RT 1721, Cleveland, OH 44115, USA, Email: m.novisky@csuohio.edu

2017), cognitive impairment (Ahalt *et al.*, 2018), traumatic brain injury (Fahmy *et al.*, 2020; O'Rourke *et al.*, 2016), poor oral health (Testa & Fahmy, 2020), exposure to violence and trauma (Anderson *et al.*, 2016; Novisky & Peralta, 2020; Piper & Berle, 2019), cancer (Baillargeon *et al.*, 2009; Binswanger *et al.*, 2014; Harzke *et al.*, 2009), and premature mortality postrelease (Binswanger *et al.*, 2007; Massoglia *et al.*, 2014; Testa *et al.*, 2018). The growing documentation of these health-related vulnerabilities makes it especially important to consider where incarcerated persons are accessing health information and how those behaviors may be related to health disparities among the incarcerated.

Although health services in correctional facilities differ in fundamental ways from health care delivered in community settings, the implications of these differences are not clearly understood. In the community, 70% of adults with internet access rely on it as their primary health information source (Prestin *et al.*, 2015). Patients who consume web-based health information are more inclined to access health information from their medical providers (Xiang & Stanley, 2017).

Health professionals are also increasingly incorporating web-based resources and emerging digital technologies (e.g., phone apps and smart watches) into care for patients during consultations (Bumgarner *et al.*, 2018; Stevenson *et al.*, 2019; Sun *et al.*, 2017; Wilson & James, 2019). Yet, because of prison policies, incarcerated persons—and sometimes their health care providers—lack unrestricted access to the internet and other digital technologies (Anaraki *et al.*, 2003; Reisdorf & Jewkes, 2016).*

Incarcerated persons also face substantial limitations in the reading materials they can access. Correctional facilities have wide discretion in banning or limiting access to literature (PEN America, 2019), and items borrowed from prison libraries lack confidentiality assurances (Conrad, 2012). The quantity, recency, and diversity of print-based health sources in prisons are also limited (Rafedzi & Abrizah, 2016), as are the hours incarcerated persons are permitted to access these sources in prison libraries (Rafedzi *et al.*, 2018).

Access to print-based health reading materials in prisons may also depend upon access to resources that are not available to everyone, including social support and family advocates (Novisky, 2018). In short, limitations in access to up-to-date reliable health information in prison settings are important considerations as such deficiencies could have adverse impacts on health.

We know that patients in community settings who are more active in health information seeking tend to have a health advantage. Patients more engaged with digital information, including use of health apps, blogs, and web-

sites, have shown greater success in altering health habits often difficult to address, including diet and exercise (Dahl *et al.*, 2018). Schulz *et al.*'s (2010) study of 748 lower back pain patients offers another example, as patients in the sample reported reductions in their use of pain medication after regularly interacting with a website designed to increase health literacy about back pain.

Thus, those who engage more often with health information sources are more apt to benefit from enhanced health, as increased engagement with health information sources likely symbolizes increased knowledge of and access to health management strategies compared with those who report less engagement with each health information source.

Although patient self-efficacy is a strong predictor of better health outcomes in the community, little is known about how and where patients in prison access health information to guide their health care decision making. These uncertainties are compounded by the carceral environment's unique emphasis on punishment and security (Sykes, 1958), which limits opportunities for maintenance of individual identities (Goffman, 1963) and "patient-first" care (Fluery-Steiner & Longazel, 2014, p. 12). We would suspect the most common source of health information among incarcerated individuals to be health care professionals given this is a mandated resource in all prisons (*Estelle v. Gamble*, 1976).

However, print sources (books, brochures, and magazines) and social contacts are likely to be used less frequently due to the many restrictions placed on reading materials in prisons (PEN America, 2019) as well as the disparate social support incarcerated persons have due to broken relationships (Duwe & Clark, 2013) and the strain of prison visits (Comfort, 2008).

As for implementation of the recommendations contained in health information, some research does report that incarcerated persons have interest in learning about incorporating healthy lifestyles. Vail *et al.* (2017) found that sampled formerly incarcerated adults reported being diagnosed with health conditions such as high blood pressure for the first time while incarcerated and were making efforts to implement lifestyle changes, including regular exercise and dietary modifications pre- and postrelease in response to these diagnoses.

Understanding more about the health information used by incarcerated adults can assist with helping incarcerated patients understand their medical conditions better and with supporting them in making medical choices. To that end, we used a nationally representative sample of incarcerated adults in the United States to advance the following aims: (a) to understand what sources of health information incarcerated adults rely on in prison and the extent to which they rely on them and (b) to describe how variations in health information source reliance are associated with health outcomes among incarcerated adults.

*Contraband sources of internet (e.g., cell phones; Ghandnoosh, 2020) and some sanctioned internet access remain possibilities.

We hypothesized respondents would report using health professionals most frequently and print sources and social contacts least frequently. We further hypothesized that respondents who reported increased use of each health information source would report better health.

Method

We used data from the Programme for the International Assessment of Adult Competencies (PIAAC) survey to address this study's aims. The PIAAC, collected through the National Center for Education Statistics (NCES), was designed to assess the proficiency of adults in four key information processing skill domains: literacy, numeracy, problem solving, and reading. Given the growing representation of adults confined in U.S. prisons, the PIAAC was adapted in 2014 to include a nationally representative sample of incarcerated persons. These data were made available for analysis through NCES in 2017.

Data were gathered by NCES team members between February and June 2014 and a two-stage random sampling design was used to select first prisons and then incarcerated respondents. In stage 1, 100 prisons were selected, with efforts made to oversample female facilities. NCES created the prison sampling frame using data from the Bureau of Justice Statistics Census of State and Federal Adult Correctional Facilities and the Directory of Adult and Juvenile Correctional Departments, Institutions, Agencies, and Probation and Parole Authorities.

Inclusion criteria required each prison to have U.S. state or federal operational designations; be separate from other facilities physically, functionally, and administratively; and be included in the 2005 Prison Census (NCES, 2020). The prison sampling frame was stratified into female-only versus male-only and coed incarcerated populations. Of the 100 prisons randomly selected from the stratified sampling frame, 98 participated (institutional response rate = 98%), including 80 male-only or coed institutions and 18 female-only institutions.

During stage 2, an average of 15 incarcerated individuals from each consenting prison were randomly selected to participate in the survey, based on a sampling algorithm developed by NCES. Respondents were randomly selected from a list of individuals occupying a bed the night before data collection (state prisons) or from a list of individuals provided 1 week before the data collection visit (federal prisons). Of the 1,546 sampled incarcerated individuals, 1,315 completed questionnaires, resulting in an overall response rate of 82.2%. (See the NCES technical report for a full description on sampling methodology [Rampey *et al.*, 2016].)

Bilingual interviewers administered the questionnaire using either computers or paper and a pencil, depending on the comprehension abilities of the respondent. Delivered in either English or Spanish, interviews lasted a

mean of 2 hours and included questions that measured literacy, numeracy, problem solving, and reading, as well as background questions and incarceration-specific measures including prison employment, incarceration length, and involvement in prison programming. The variables selected for analysis are described below (Appendix A).

Dependent Variable

Self-Rated Health. Respondents were asked to assess their health using a Likert-style question with five response options: "poor," "fair," "good," "very good," and "excellent." Following past research, self-reported health was collapsed and recoded to form binary responses, with poor, fair, and good coded as "0" for non-optimal health and very good and excellent coded as "1" for optimal health (Feinberg *et al.*, 2016; Manor *et al.*, 2000; Wilson & Kaplan, 1995). This measure of health is one of the most widely used to assess subjective physical well-being and is consistently shown to be both valid and reliable (Cullati *et al.*, 2020; DeSalvo *et al.*, 2006a, 2006b; Schnittker & Bacak, 2014).

Independent Variables

Sources of Health Information. Health information seeking behavior is operationalized as the frequency with which respondents reported using various sources to obtain health information. Participants were asked about their engagement with seven sources: health care professionals (doctors/nurses/therapists/psychologists), books or brochures, magazines, social contacts (family/friends), television, newspapers, and radio. Participants were asked, "how much information about health issues do you get from..." for each of the seven sources.

Respondents were asked to choose among Likert scale responses, with "1" indicating "none," "2" indicating "a little," "3" indicating "some," and "4" indicating "a lot." Responses were recoded and seven dichotomous variables were created. For each variable, "0" indicates respondents reported using the source "none" or "a little" and "1" indicates respondents reported using the source "some" or "a lot."

Covariates and Control Variables

We included several additional variables in our analyses that could affect the relationship between reported sources of health information use and self-rated health, including self-reported demographics (gender [male, female], race/ethnicity [White, Black, Hispanic, other race], education [less than high school, high school, graduate/GED, some college, or higher], age [18–24, 25–34, 35–44, 45+ years], and birth in the United States [yes, no]). Prior incarceration was assessed by asking respondents

whether they had ever served time in a prison, jail, or some other correctional facility before their current period of incarceration. Prison employment was defined as answering yes to the question “do you have a prison job?”

Analytic Strategy

Our analyses were conducted using IBM SPSS and the International Database Analyzer, a standalone analysis tool produced by the International Association for the Evaluation of Educational Achievement (2017). All analyses were weighted using weights provided by PIAAC to account for the study’s complex multistage sampling design, including weights to account for selection probabilities at the prison and individual levels, and to adjust for nonresponse.

Estimates are also representative of the target population, adjusted to align with the 2013 prison population proportions as reported by the Bureau of Justice Statistics (Rampey *et al.*, 2016). For all analyses, we set statistical significance at the .05 level. We report both standard errors in the bivariate analyses and 95% confidence intervals (CIs) for the logistic regression equations, along with *p*-values to assist in the interpretation of our model’s results.

Descriptive statistics were first examined to provide a summary understanding of the data in terms of demographic characteristics as well as the proportion of the sample that indicated utilizing each of the seven possible sources of health information. Descriptive statistics were also generated among the 2017 PIAAC community sample for purposes of comparison with our sample. Since the outcome variable, optimal health, is dichotomous, we used binary logistic regression to determine the log odds of participants being in optimal health, holding constant the effects of covariates. Model 1 includes sources of health information with no controls to analyze the influence of utilizing these sources on likelihood of optimal health.

Model 2 consists of the covariates gender, race, education, age, born in United States, prior incarceration, and having a prison job. Model 3 is the full model with all predictor variables, including the health information source variables and all covariates. Appropriate university institutional review board permissions were sought and granted for use of all data analyses described below.

Results

Population Characteristics

Respondent characteristics are presented in Table 1, alongside the 2017 PIAAC community sample for comparison. The prison sample is composed mostly of male respondents (93.3%). Black individuals are represented in the largest proportion in the sample (36.6%), whereas

Table 1. Demographic Characteristics and Self-Rated Physical Health for Community and Prison Samples

Variable	Prison sample % (SE)	Community sample % (SE)
Gender		
Male	93.3 (0.0)	48.9 (0.0)
Female	6.7 (0.0)	51.1 (0.0)
Race		
White	34.2 (1.0)	66.4 (0.7)
Black	36.6 (0.1)	12.3 (0.1)
Hispanic	22.0 (0.1)	14.0 (0.3)
Other race	7.2 (1.1)	7.2 (0.7)
Education		
Less than high school	30.0 (1.5)	14.0 (0.2)
High school grad/GED	55.2 (1.4)	41.1 (0.4)
Some college or more	14.8 (0.9)	44.9 (0.4)
Age (years)		
18–24	12.7 (0.8)	16.8 (0.2)
25–34	34.9 (1.4)	18.5 (0.2)
35–44	24.3 (1.2)	17.9 (0.2)
45+	28.1 (0.9)	46.8 (0.2)
Employment		
Unemployed	38.9 (2.3)	30.2 (0.6)
Employed	61.1 (2.3)	69.8 (0.6)
Born in the United States		
No	7.4 (1.2)	14.2 (0.4)
Yes	92.7 (1.2)	85.8 (0.4)
Prior incarceration		
No	27.1 (1.4)	—
Yes	72.9 (1.4)	—
Self-rated health		
Nonoptimal health	47.4 (1.5)	44.6 (0.8)
Optimal health	52.6 (1.5)	55.4 (0.8)

All percentages are weighted for representativeness.
SE = standard error.

34.2% of respondents identified as White, 22.0% identified as Hispanic, and 7.2% indicated “other race.” A majority of the incarcerated individuals in the sample (72.9%) reported a history of incarceration. Over half (52.6%) reported very good or excellent health.

Compared with the community sample, Black adults are overrepresented and White adults are underrepresented in the prison sample. Respondents without a high school diploma or GED were also overrepresented, and those with at least some college experience were underrepresented in the prison sample. A majority of respondents in both groups also report very good or excellent health, although this proportion is slightly greater in the community sample (55.4%).

Use and Type of Health Information Sources

Table 2 displays sources of health information among both the incarcerated sample and the PIAAC community sample. Television was the most commonly reported

Table 2. Sources of Health Information: “How much information about health issues do you get from...” for Community and Prison Samples

Use source (some/a lot)	Prison sample % using source (SE)	Community sample % using source (SE)
Television	72.9 (1.2)	63.7 (0.8)
Social contacts	61.8 (1.6)	67.3 (0.6)
Magazines	61.4 (1.8)	41.0 (0.6)
Books or brochures	60.9 (1.8)	47.8 (0.6)
Health care professionals	52.6 (1.5)	74.9 (0.6)
Newspapers	46.1 (1.6)	32.0 (0.9)
Radio	35.7 (2.1)	33.3 (0.7)
None of the above seven sources	6.6 (1.2)	8.4 (0.5)
Internet	—	71.3 (0.6)
None of the eight sources	—	5.5 (0.5)

All percentages are weighted for representativeness.

source among incarcerated individuals (72.9%), followed by social contacts (61.8%), magazines (61.4%), books or brochures (60.9%), and then by health care professionals (52.6%). By comparison, health care professionals were the most commonly reported source of health information among community respondents (74.9%). Importantly, over 70% of community respondents identify the internet as a source of health information, to which incarcerated individuals lack unrestricted access. Newspapers and radio were used by less than half the prison and community samples.

The Contribution of Each Health Information Source on Self-Rated Health. To assess the unique contribution of each source of health information on self-rated health, we estimated three logistic regression models, holding constant the effects of other predictors. We note that weighted male- and female-specific multivariate models were also tested but did not yield unique results. Since so little is known regarding our research questions, we present results from only the combined models, which are given in Table 3. Model 1 tests the effect of each source of health information on likelihood of optimal health, controlling for the influence of other sources.

In this model, obtaining health information from magazines (odds ratio [OR]: 1.74, 95% CI 1.22–2.49, $p = .002$) and from books or brochures (OR: 1.45, 95% CI 1.04–2.03, $p = .028$) was significantly associated with increased odds of self-rated optimal health. The negative effect of health care professionals, though not meeting the $p < .05$ threshold, is noted due to its low p -value ($p = .051$).

These variables are removed in Model 2, which tests the influence of model covariates on likelihood of optimal health. In Model 2, being Black as compared with being White is associated with an increase in the likelihood of reporting optimal health (OR: 1.58, CI 1.19–2.11, $p = .002$). Compared with incarcerated individuals in the

sample who did not complete high school, high school graduates (OR: 1.42, CI 1.07–1.88, $p = .019$) and those who attended at least some college (OR: 2.11, CI 1.47–3.04, $p < .001$) had higher odds of reporting optimal health.

In addition, being 18–24 years old (OR: 3.68, CI 2.51–5.40, $p < .001$), 25–34 years old (OR: 3.96, CI 2.98–5.26, $p < .001$), or 35–44 years old (OR: 2.51, CI 1.93–3.25, $p < .001$) was associated with optimal health as compared with being 45 years old or older. Being employed in prison (OR: 1.42, CI 1.06–1.92, $p = .019$) was associated with increased likelihood of optimal health. Other variables failed to reach significance in this model.

Model 3 combines the sources of health information from Model 1 with the variables from Model 2 to test the influence of each source on health, net of the effects of control covariates. As in Model 1, obtaining health information from magazines (OR: 1.44, CI 1.01–2.06, $p = .043$) and from books or brochures (OR: 1.46, CI 1.05–2.02, $p = .024$) was positively associated with an incarcerated individual's odds of being in optimal health. This model estimates that, controlling for all model predictors, obtaining health information from magazines or from books or brochures is associated with 44% and 46% increases in the odds of being in optimal health among incarcerated individuals in our sample, respectively.

The influence of obtaining information from health care professionals was again negative and approaching the $p < .05$ threshold ($p = .052$). The significance of covariates in Model 3 mirrors Model 2, with being female as compared with being male, being Latino/Hispanic or belonging to the “Other” racial group as compared with being White, born in the United States, and prior incarceration not significantly associated with self-rated health.

Discussion and Conclusion

Mounting evidence identifies incarceration as a potent social determinant of health (Massoglia & Pridemore, 2015), especially among African Americans (Blankenship *et al.*, 2018; Massoglia, 2008b; Noonan *et al.*, 2016). Yet, prisons remain uniquely challenging settings for the provision of health care services. Irrespective of these challenges, however, “...the closed environment of prison gives health care workers an ideal opportunity to screen, prevent, and treat diseases that often go unaddressed in the community for this disadvantaged population” (Yu *et al.*, 2015, p. 66).

Thus far, evidence of this can be found in studies highlighting general health improvements in prison (Yu *et al.*, 2015), enhanced accessibility of mental health medications (Wilper *et al.*, 2009), and reductions in injuries and fatalities associated with gun violence (Patterson, 2010).

To expand upon the potential pathways with which health might be improved during incarceration (and ultimately over the life course), more evidence documenting existing health behaviors in prisons is sorely needed,

Table 3. Logistic Regression Odds Ratio, 95% Confidence Interval, and *p*-Values for Models Predicting Self-Rated Health for Prison Sample (N = 1,280), Weighted for Representativeness

<i>Independent variables</i>	<i>Health information sources only OR (95% CI); p-value</i>	<i>Controls only OR (95% CI); p-value</i>	<i>Full model OR (95% CI); p-value</i>
Gender			
Male ^a	—	—	—
Female	—	0.77 (0.54–1.10); .156	0.82 (0.58–1.16); .269
Race			
White ^a	—	—	—
Black	—	1.58 (1.19–2.11); .002	1.45 (1.08–1.94); .013
Hispanic	—	1.13 (0.71–1.81); .599	1.09 (0.67–1.76); .731
Other race	—	1.26 (0.78–2.04); .350	1.21 (0.74–2.00); .444
Education			
Less than high school ^a	—	—	—
High school grad/GED	—	1.42 (1.07–1.88); .015	1.33 (1.01–1.76); .045
Some college or more	—	2.11 (1.47–3.04); .000	1.91 (1.34–2.71); .000
Age (years)			
18–24	—	3.68 (2.51–5.40); .000	3.68 (2.48–5.46); .000
25–34	—	3.96 (2.98–5.26); .000	3.77 (2.79–5.09); .000
35–44	—	2.51 (1.93–3.25); .000	2.39 (1.81–3.16); .000
45+ ^a	—	—	—
Prison employment	—	1.42 (1.06–1.92); .019	1.39 (1.02–1.89); .035
Born in the United States	—	1.37 (0.86–2.18); .180	1.27 (0.79–2.03); .317
Prior incarceration	—	0.86 (0.62–1.20); .387	0.90 (0.63–1.27); .537
Television	1.22 (0.88–1.68); .231	—	1.21 (0.84–1.75); .311
Social contacts	1.07 (0.78–1.46); .676	—	0.96 (0.71–1.30); .796
Magazines	1.74 (1.22–2.49); .002	—	1.44 (1.01–2.06); .043
Books or brochures	1.45 (1.04–2.03); .028	—	1.46 (1.05–2.02); .024
Health care professionals	0.77 (0.59–1.00); .051	—	0.77 (0.58–1.00); .052
Newspapers	1.03 (0.83–1.28); .780	—	1.07 (0.83–1.39); .582
Radio	0.97 (0.77–1.22); .770	—	1.03 (0.80–1.33); .799
Constant	0.59 (0.45–0.78); .000	0.19 (0.10–0.36); .000	0.14 (0.07–0.30); .000
Log-likelihood	1,605,511.83	1,538,667.19	1,507,388.72
Cox & Snell R ²	.04	.09	.11
Nagelkerke R ²	.06	.12	.15

^aReference category.

CI = confidence interval; OR = odds ratio.

particularly from the perspective of incarcerated patients. Using a nationally representative sample of incarcerated men and women, our study contributes to the literature by identifying the specific sources of health information incarcerated persons are relying upon and how reliance on these sources is related to their health. To our knowledge, ours is the first study to offer these contributions, making the findings reported here especially valuable. Below we provide some context for our findings and offer necessary directions for future research.

First, it is worth noting that although health care professionals were the most commonly relied upon resource for health information among community respondents, incarcerated respondents reported relying on health care professionals less than multiple other sources, including television, social contacts, books and brochures, and magazines. In fact, the incarcerated sample reported relying on only two sources less often than health care professionals: newspapers and radio.

This finding is particularly troubling because access to health care professionals is the only source universally guaranteed to incarcerated individuals, as other sources can be restricted, taken away, outdated, or not provided at all depending on each particular prison, its general security protocols, its resources, and the variability with which these factors can each change from day to day. The less frequent reliance on medical professionals for health information, in combination with a lack of unrestricted access to digital sources of health information among incarcerated persons, calls attention to the inherent differences between prisons and communities as sites of health care, as health care professionals and the internet were the two most relied upon sources of health information in the community sample.

We suspect the under-reliance on health care professionals for health information among incarcerated persons is driven by limitations in the practical accessibility of health care providers. The rise in medical copayments in

prisons (see Sawyer, 2017) may deter incarcerated persons from requesting medical appointments. Desires to avoid these charges, combined with the often understaffed and under-resourced realities of prison medical departments in an era of prison overcrowding (*Brown v. Plata*, 2011), may exert a chilling effect as far as the reliance of incarcerated individuals on health care professionals.

It is also possible that some incarcerated patients under-rely on health professionals for health information due to perceived inadequacies about prison medical services. Complaints about medical services were among the most commonly cited categories of grievances in Calavita and Jenness' (2015) study of the prison grievance system in California, for example.

Mindfulness of these barriers may help explain why accessing health information from health care professionals was associated with *worse health*: Some incarcerated persons may avoid seeking out health care professionals until their health deteriorates to the point avoidance is no longer possible. Given that it is unlikely for health outcomes among incarcerated persons to significantly improve without adequate engagement with health care providers, we urge future researchers to explore these and other potential reasons incarcerated individuals report relying less on health care professionals for their health information than multiple other sources. Likewise, it will be important to develop and implement policies to improve reliance on health care professionals for medical information among incarcerated persons.

We also found that obtaining health information from magazines and from books or brochures was significantly associated with increased odds of optimal health. This effect persisted even after accounting for factors such as prison employment and sociodemographic characteristics. This suggests that these two sources may be particularly important pathways for improving health status among incarcerated persons.

Future studies should explore these sources in more depth, for example, by examining the types of magazines, books, and brochures incarcerated individuals are using for health information and their reliability. Although more work is necessary to fully understand the possible links between these sources and health status, we offer evidence that print sources may be particularly important to understanding the health behaviors of incarcerated adults.

Other sources of health information, including newspapers, radio, television, health care professionals, and social contacts, did not reach significance in multivariate models. Past research has identified television as an important predictor of health using the PIAAC community data (Feinberg *et al.*, 2016), but our study indicates this may not be true among incarcerated persons. This is important because respondents in the sample indicated obtaining health information from television

more than any other source. Social contacts, the next most frequently indicated source, were also not associated with self-reported health. Future research should investigate how these commonly used sources of health information could promote better health among incarcerated persons.

It is important to consider our findings in the context of certain limitations. First, data relied on self-report. However, self-rated health has been shown to be a valid representation of health statuses (Bačák & Ólafsdóttir, 2017; Haddock *et al.*, 2006; Miilunpalo *et al.*, 1997; Pérez-Zepeda *et al.*, 2016) and mortality (Idler & Benyamini, 1997). Furthermore, research has found consistency across data sources when self-report and administrative data are compared in prison settings (see Pyrooz *et al.*, 2019). In addition, respondents were sampled from state and federal prisons, and it is possible that results may have varied had respondents from privately operated facilities or local jails been included.

Future research should make efforts to include respondents from both private prisons and jails given that a significant number of U.S. adults are confined in these facilities. Considering the shorter incarceration periods in jails, for example, jail detainees may seek out medical professionals even less than individuals in prisons since their periods of confinement have far less permanency.

Another limitation is that although prison rules often ban incarcerated persons from using the internet, some sanctioned access exists, although limited and under supervision. Moreover, contraband (i.e., cellphones) still enters correctional facilities (Grommon *et al.*, 2018). This raises the possibility that some sampled respondents may have used the internet as a source of health information through contraband access but were unable to report it because internet use was not included in the PIAAC survey. Future research should focus on understanding the degree to which contraband sources inform health knowledge among—and can be used to reach—incarcerated patients.

Additional research should also assess the contribution of health information not assessed in the PIAAC survey, including peer educators, internal video messages (e.g., closed circuit TV), posters, tablets, and supervised internet access. Finally, future studies that include longitudinal measures would help to understand the causal mechanisms between modes of health information acquisition and health outcomes. Additional funding of the PIAAC incarcerated subsample could help support the development of additional (and more comprehensive) waves of data collection.

Overall, this study offers the first use of a nationally representative sample of imprisoned adults in the United States to shed light on the sources of health information incarcerated persons rely on and how use of those sources is related to incarcerated individuals' assessments of their

health. Although additional research on health information seeking behaviors among incarcerated individuals is necessary, particularly research that incorporates longitudinal designs, the findings reported here offer a promising starting point for understanding more about the health behaviors of this vulnerable population.

Enhanced access to print-based health sources, programs that increase the accessibility of medical providers, and options for incorporating digital technology into prison-based health care services are likely to be especially valuable avenues for reducing health disparities among incarcerated persons moving forward.

Authors' Note

Although this research was made possible through educational testing service funding, the contents of this article do not necessarily represent the policy of the Department of Education. Endorsement by the U.S. federal government should not be assumed.

Author Disclosure Statement

The authors disclosed no conflicts of interest with respect to the research, authorship, or publication of this article.

Funding Information

This research was funded through an educational testing service grant from the Institute of Education Sciences, U.S. Department of Education.

References

- Ahalt, C., Stijacic-Cenzer, I., Miller, B. L., Rosen, H. J., Barnes, D. E., & Williams, B. A. (2018). Cognition and incarceration: Cognitive impairment and its associated outcomes in older adults in jail. *Journal of the American Geriatrics Society, 66*(11), 2065–2071. <https://doi.org/10.1111/jgs.15521>
- Anaraki, S., Plugge, E., & Hill, A. (2003). Delivering primary care in prison: The need to improve health information. *Informatics in Primary Care, 11*(4), 191–194. <https://doi.org/10.14236/jhi.v11i4.566>
- Anderson, R. E., Geier, T. J., & Cahill, S. P. (2016). Epidemiological associations between posttraumatic stress disorder and incarceration in the National Survey of American Life. *Criminal Behavior and Mental Health, 26*(2), 110–123. <https://doi.org/10.1002/cbm.1951>
- Bačák, V., & Ólafsdóttir, S. (2017). Gender and validity of self-rated health in nineteen European countries. *Scandinavian Journal of Public Health, 45*(6), 647–653. <https://doi.org/10.1177/1403494817717405>
- Baillargeon, J., Snyder, N., Soloway, R. D., Paar, D., Baillargeon, G., Spaulding, A. C., Pollock, B. H., Arcari, C. M., Williams, B. A., & Raimer, B. G. (2009). Hepatocellular carcinoma prevalence and mortality in a male state prison population. *Public Health Reports, 124*(1), 120–126. <https://doi.org/10.1177/003335490912400115>
- Binswanger, I. A., Carson, E. A., Krueger, P. M., Mueller, S. R., Steiner, J. F., & Sabol, W. J. (2014). Prison tobacco control policies and deaths from smoking in United States prisons: Population based retrospective analysis. *British Medical Journal, 349*, g4542. <https://doi.org/10.1136/bmj.g4542>
- Binswanger, I. A., Krueger, P. M., & Steiner, J. F. (2009). Prevalence of chronic medical conditions among jail and prison inmates in the USA compared with the general population. *Journal of Epidemiology and Community Health, 63*(11), 912–919. <https://doi.org/10.1136/jech.2009.090662>
- Binswanger, I. A., Stern, M. F., Deyo, R. A., Heagerty, P. J., Cheadle, A., Elmore, J. G., & Koepsell, T. D. (2007). Release from prison—A high risk of death for former inmates. *New England Journal of Medicine, 356*(2), 157–165. <https://doi.org/10.1056/NEJMs064115>
- Blankenship, K. M., del Rio Gonzalez, A. M., Keene, D. E., Groves, A. K., & Rosenberg, A. P. (2018). Mass incarceration, race inequality, and health: Expanding concepts and assessing impacts on well-being. *Social Science & Medicine, 215*, 45–52. <https://doi.org/10.1016/j.socscimed.2018.08.042>
- Brinkley-Rubinstein, L., Cloud, D. H., Davis, C., Zaller, N., Delany-Brumsey, A., Pope, L., Martino, S., Bouvier, B., & Rich, J. (2017). Addressing excess risk of overdose among recently incarcerated people in the USA: Harm reduction interventions in correctional settings. *International Journal of Prisoner Health, 13*(1), 25–31. <https://doi.org/10.1108/IJPH-08-2016-0039>
- Bronson, J., & Carson, E. A. (2019). *Prisoners in 2017* (NCJ 252156). Bureau of Justice Statistics. <https://bjs.ojp.gov/content/pub/pdf/p17.pdf>
- Brown v. Plata, 563 US 493 (2011). <https://www.supremecourt.gov/opinions/10pdf/09-1233.pdf>
- Bumgarner, J. M., Lambert, C. T., Hussein, A. A., Cantillon, D. J., Baranowski, B., Wolski, K., Lindsay, B. D., Wazni, O. M., & Tarakji, K. G. (2018). Smart-watch algorithm for automated detection of atrial fibrillation. *Journal of the American College of Cardiology, 71*(21), 2381–2388. <https://doi.org/10.1016/j.jacc.2018.03.003>
- Calavita, K., & Jenness, V. (2015). *Appealing to justice: Prisoner grievances, rights, and carceral logic*. University of California Press.
- Comfort, M. (2008). *Doing time together: Love and family in the shadow of the prison*. University of Chicago Press.
- Conrad, S. (2012). Collection development and circulation policies in prison libraries: An exploratory survey of librarians in US correctional institutions. *Library Quarterly, 82*(4), 407–427.
- Cullati, S., Bochatay, N., Rossier, C., Guessous, I., Burton-Jeangros, C., & Courvoisier, D. S. (2020). Does the single-item self-rated health measure the same thing across different wordings? Construct validity study. *Quality of Life Research, 29*(9), 2593–2604. <https://doi.org/10.1007/s11136-020-02533-2>
- Dahl, A. J., Peltier, J. W., & Milne, G. R. (2018). Development of a value co-creation wellness model: The role of physicians and digital information seeking on health behaviors and health outcomes. *Journal of Consumer Affairs, 52*(6), 562–594. <https://doi.org/10.1111/joca.12176>
- DeSalvo, K. B., Blosner, N., Reynolds, K., He, J., & Munter, P. (2006a). Mortality prediction with a single general self-rated health question: A meta-analysis. *Journal of General Internal Medicine, 21*(3), 267–275. <https://doi.org/10.1111/j.1525-1497.2005.00291.x>
- DeSalvo, K. B., Fisher, W. P., Tran, K., Blosner, N., Merrill, W., & Peabody, J. (2006b). Assessing measurement properties of two single-item general health measures. *Quality of Life Research, 15*(2), 191–201. <https://doi.org/10.1007/s11136-005-0887-2>
- Duwe, G., & Clark, V. (2013). Blessed be the social tie that binds: The effect of prison visitation on offender recidivism. *Criminal Justice Policy Review, 24*(3), 271–296. <https://doi.org/10.1177/0887403411429724>
- Estelle v. Gamble, 429 U.S. 97 (1976). <http://cdn.loc.gov/service/ll/usrep/usrep429/usrep429097/usrep429097.pdf>
- Fahmy, C., Jackson, D. B., Pyrooz, D. C., & Decker, S. H. (2020). Head injury in prison: Gang membership and the role of violence. *Journal of Criminal Justice, 67*, 101658. <https://doi.org/10.1016/j.jcrimjus.2020.101658>
- Feinberg, I., Frijters, J., Johnson-Lawrence, V., Greenberg, D., Nightingale, E., & Moodie, C. (2016). Examining associations between health information seeking behavior and adult education status in the U.S.: An analysis of the 2012 PIAAC data. *PLoS One, 11*(2), e0148751. <https://doi.org/10.1371/journal.pone.0148751>
- Fluery-Steiner, B., & Longazel, J. (2014). *The pains of mass imprisonment: Framing 21st century social issues*. Routledge.
- Ghandnoosh, N. (2020). Cell phones and “excessive contact”: The contradictory imperatives facing California’s parole-eligible lifers. *Criminal Justice Policy Review, 31*(2), 159–181. <https://doi.org/10.1177/0887403418778205>
- Goffman, E. (1963). *Stigma: Notes on the management of spoiled identity*. Prentice-Hall.
- Grommon, E., Carter, J., & Scheer, C. (2018). Quantifying the size of the contraband cell phone problem: Insights from a large rural state penitentiary. *The Prison Journal, 98*(5), 630–648. <https://doi.org/10.1177/0032885518794116>
- Haddock, C. K., Poston, W. S. C., Pyle, S. A., Klesges, R. C., Vander Weg, M. W., Peterson, A., & Debon, M. (2006). The validity of self-rated health as a measure of health status among young military personnel: Evidence from a cross-sectional survey. *Health and Quality of Life Outcomes, 4*(57). <https://doi.org/10.1186/1477-7525-4-57>
- Harzke, A. J., Baillargeon, J. G., Goodman, K. J., & Pruitt, S. L. (2009). Liver cancer mortality among male prison inmates in Texas, 1992–2003. *Preventive Medicine, 48*(6), 588–592. <https://doi.org/10.1016/j.ypmed.2009.03.011>

- Idler, E. L., & Benyamini, Y. (1997). Self-rated health and mortality: A review of twenty-seven community studies. *Journal of Health and Social Behavior, 38*(1), 21–37.
- International Association for the Evaluation of Educational Achievement. (2017). Tools: Working with IEA data. <https://www.iea.nl/data-tools/tools#section-308>
- Lorvick, J., Comfort, M. L., Krebs, C. P., & Kral, A. H. (2015). Health service use and social vulnerability in a community-based sample of women on probation and parole, 2011–2013. *Health & Justice, 3*(13). <https://doi.org/10.1186/s40352-015-0024-4>
- Manor, O., Matthews, S., & Power, C. (2000). Dichotomous or categorical response? Analyzing self-rated health and lifetime social class. *International Journal of Epidemiology, 29*(1), 149–157. <https://doi.org/10.1093/ije/29.1.149>
- Marlowe, M. A., Luna-Gierke, R. E., Griffin, P. M., & Vieira, A. R. (2017). Food-borne disease outbreaks in correctional institutions, United States, 1998–2014. *American Journal of Public Health, 107*(7), 1150–1156. <https://doi.org/10.2105/AJPH.2017.303816>
- Massoglia, M. (2008a). Incarceration as exposure: The prison, infectious disease, and other stress-related illnesses. *Journal of Health and Social Behavior, 49*(1), 56–71. <https://doi.org/10.1177/002214650804900105>
- Massoglia, M. (2008b). Incarceration, health, and racial disparities in health. *Law & Society Review, 42*(2), 275–306.
- Massoglia, M., Pare, P. P., Schnittker, J., & Gagnon, A. (2014). The relationship between incarceration and premature adult mortality: Gender specific evidence. *Social Science Research, 46*, 142–154. <https://doi.org/10.1016/j.ssresearch.2014.03.002>
- Massoglia, M., & Pridemore, W. A. (2015). Incarceration and health. *Annual Review of Sociology, 41*(1), 291–310. <https://doi.org/10.1146/annurev-soc-073014-112326>
- Miilunpalo, S., Vuori, I., Oja, P., Pasanen, M., & Urponen, H. (1997). Self-rated health status as a health measure: The predictive value of self-reported health status on the use of physician services and on mortality in the working-age population. *Journal of Clinical Epidemiology, 50*(5), 517–528. [https://doi.org/10.1016/s0895-4356\(97\)00045-0](https://doi.org/10.1016/s0895-4356(97)00045-0)
- Moazen, B., Saeedi Moghaddam, S., Silbernagl, M. A., Lotfizadeh, M., Bosworth, R. J., Alammehjerdi, Z., Kinner, S. A., Wirtz, A. L., Bärnighausen, T. W., Stöver, H. J., & Dolan, K. A. (2018). Prevalence of drug injection, sexual activity, tattooing, and piercing among prison inmates. *Epidemiologic Reviews, 40*(1), 58–69. <https://doi.org/10.1093/epirev/mxy002>
- National Center for Education Statistics. (2020). Program for the International Assessment of Adult Competencies (PIAAC): Frequently asked questions. <https://nces.ed.gov/surveys/piaac/piaac/faq.asp>
- Noonan, A. S., Velasco-Mondragon, H. E., & Wagner, F. A. (2016). Improving the health of African Americans in the USA: An overdue opportunity for social justice. *Public Health Reviews, 37*(12). <https://doi.org/10.1186/s40985-016-0025-4>
- Novisky, M. A. (2018). Avoiding the runaround: The link between cultural health capital and health management among older prisoners. *Criminology, 56*(4), 643–678. <https://doi.org/10.1111/1745-9125.12188>
- Novisky, M. A., & Peralta, R. L. (2020). Gladiator school: Returning citizens' experiences with secondary violence exposure in prison. *Victims & Offenders, 15*(5), 594–618. <https://doi.org/10.1080/15564886.2020.1721387>
- O'Rourke, C., Linden, M. A., Lohan, M., & Bates-Gaston, J. (2016). Traumatic brain injury and co-occurring problems in prison populations: A systematic review. *Brain Injury, 30*(7), 839–854. <https://doi.org/10.3109/02699052.2016.1146967>
- Patterson, E. J. (2010). Incarcerating death: Mortality in U.S. state correctional facilities, 1985–1998. *Demography, 47*(3), 587–607. <https://doi.org/10.1353/dem.0.0123>
- PEN America. (2019, September). *Literature locked up: How prison book restriction policies constitute the nation's largest book ban* [Policy paper]. <https://pen.org/wp-content/uploads/2019/09/literature-locked-up-report-9.24.19.pdf>
- Pérez-Zepeda, M. U., Belanger, E., Zunzunegui, M. V., Phillips, S., Ylli, A., & Guralnik, J. (2016). Assessing the validity of self-rated health with the short physical performance battery: A cross sectional analysis of the international mobility in aging study. *PLoS One, 11*(4), e0153855. <https://doi.org/10.1371/journal.pone.0153855>
- Piper, A., & Berle, D. (2019). The association between trauma experienced during incarceration and PTSD outcomes: A systematic review and meta-analysis. *Journal of Forensic Psychiatry & Psychology, 30*(5), 854–875. <https://doi.org/10.1080/14789949.2019.1639788>
- Pont, J., Stöver, H., Gétaz, L., Casillas, A., & Wolff, H. (2015). Prevention of violence in prison—The role of health care professionals. *Journal of Forensic and Legal Medicine, 34*, 127–132. <https://doi.org/10.1016/j.jflm.2015.05.014>
- Porter, L. C., & DeMarco, L. M. (2019). Beyond the dichotomy: Incarceration dosage and mental health. *Criminology, 57*(1), 136–156. <https://doi.org/10.1111/1745-9125.12199>
- Porter, L. C., & Novisky, M. A. (2017). Pathways to depressive symptoms among former inmates. *Justice Quarterly, 34*(5), 847–872. <https://doi.org/10.1080/07418825.2016.1226938>
- Prestin, A., Vieux, S. N., & Chou, W. Y. (2015). Is online health activity alive and well or flatlining? Findings from 10 years of the Health Information National Trends Survey. *Journal of Health Communication, 20*(7), 790–798. <https://doi.org/10.1080/10810730.2015.1018590>
- Pyrooz, D. C., Decker, S. H., & Owens, E. (2019). Do prison administrative and survey data sources tell the same story? A multitrait, multimethod examination with application to gangs. *Crime & Delinquency, 66*(5), 627–662. <https://doi.org/10.1177/0011128719879017>
- Rafedzi, E. R. K., & Abrizah, A. (2016). Information needs of male juvenile delinquents: The needs to be met in a prison setting. *Information Development, 32*(3), 592–607. <https://doi.org/10.1177/0266666914563357>
- Rafedzi, E. R. K., Zainal, N. K., Yu, H., & Kamal, J. I. A. (2018). Barriers to access the information by male juvenile delinquents in Malaysia. *International Journal of Academic Research in Progressive Education and Development, 7*(3), 86–95. <http://dx.doi.org/10.6007/IJARPE/v7-i3/4349>
- Rampey, B. D., Keiper, S., Mohadjer, L., Krenzke, T., Li, J., Thornton, N., & Hogan, J. (2016). *Highlights from the U.S. PIAAC Survey of Incarcerated Adults: Their skills, work experience, education, and training: Program for the International Assessment of Adult Competencies: 2014* (NCES 2016-040). U.S. Department of Education. National Center for Education Statistics. <https://nces.ed.gov/pubs2016/2016040.pdf>
- Reisdorf, B. C., & Jewkes, Y. (2016). (B)Locked sites: Cases of internet use in three British prisons. *Information, Communication & Society, 19*(6), 771–786. <https://doi.org/10.1080/1369118X.2016.1153124>
- Rich, J. D., Allen, S. A., & Williams, B. A. (2015). The need for higher standards in correctional healthcare to improve public health. *Journal of General Internal Medicine, 30*(4), 503–507. <https://doi.org/10.1007/s11606-014-3142-0>
- Rich, J. D., Chandler, R., Williams, B. A., Dumont, D., Wang, E. A., Taxman, F. S., Allen, S. A., Clarke, J. G., Greifinger, R. B., Wildeman, C., Osher, F. C., Rosenberg, S., Haney, C., Mauer, M., & Western, B. (2014). How health care reform can transform the health of criminal justice-involved individuals. *Health Affairs, 33*(3), 462–467. <https://doi.org/10.1377/hlthaff.2013.1133>
- Sawyer, W. (2017, April 19). *The steep cost of medical co-pays in prison puts health at risk*. Prison Policy Initiative. <https://www.prisonpolicy.org/blog/2017/04/19/copays/>
- Schnittker, J., & Bacak, V. (2014). The increasing predictive validity of self-rated health. *PLoS One, 9*(1), e84933. <https://doi.org/10.1371/journal.pone.0084933>
- Schnittker, J., Massoglia, M., & Uggen, C. (2012). Out and down: Incarceration and psychiatric disorders. *Journal of Health and Social Behavior, 53*(4), 448–464. <https://doi.org/10.1177/0022146512453928>
- Schulz, P. J., Rubinelli, S., Zufferey, M. C., & Hartung, U. (2010). Coping with chronic lower back pain: Designing and testing the online tool ONESELF. *Journal of Computer-Mediated Communication, 15*(4), 625–645. <https://doi.org/10.1111/j.1083-6101.2009.01509.x>
- Stevenson, F., Hall, L., Sequin, M., Atherton, H., Barnes, R., Leydon, G., Pope, C., Murray, E., & Ziebland, S. (2019). General practitioner's use of online resources during medical visits: Managing the boundary between inside and outside the clinic. *Sociology of Health & Illness, 41*(Suppl 1), 65–81. <https://doi.org/10.1111/1467-9566.12833>
- Sun, V., Dumitra, S., Ruel, N., Lee, B., Melstrom, L., Melstrom, K., Woo, Y., Sentovich, S., Singh, G., & Fong, Y. (2017). Wireless monitoring program of patient-centered outcomes and recovery before and after major abdominal cancer surgery. *JAMA Surgery, 152*(9), 852–859. <https://doi.org/10.1001/jamasurg.2017.1519>
- Sykes, G. M. (1958). *The society of captives: A study of a maximum security prison* (1st ed.). Princeton University Press.
- Testa, A., & Fahmy, C. (2020). Oral health status and oral health care use among formerly incarcerated people. *Journal of the American Dental Association, 151*(3), 164–173. <https://doi.org/10.1016/j.adaj.2019.10.026>

- Testa, A., Porter, L. C., & Nakamura, K. (2018). Examining all-cause and cause-specific mortality among former prisoners in Pennsylvania. *Justice Quarterly*, *35*(5), 782–815. <https://doi.org/10.1080/07418825.2017.1341541>
- Tran, N. T., Dubost, C., Baggio, S., Gétaz, L., & Wolff, H. (2018). Safer tattooing interventions in prisons: A systematic review and call to action. *BMC Public Health*, *18*(1), 1015. <https://doi.org/10.1186/s12889-018-5867-x>.
- Turney, K., Wildeman, C., & Schnittker, J. (2012). As fathers and felons: Explaining the effects of current and recent incarceration on major depression. *Journal of Health and Social Behavior*, *53*(4), 465–481. <https://doi.org/10.1177/0022146512462400>
- Vail, W. L., Niyogi, A., Henderson, N., & Wennerstrom, A. (2017). Bringing it all back home: Understanding the medical difficulties encountered by newly released prisoners in New Orleans, Louisiana—A qualitative study. *Health & Social Care in the Community*, *25*(4), 1448–1458. <https://doi.org/10.1111/hsc.12445>
- Walsh, E., Forsyth, K., Senior, J., O'Hara, K., & Shaw, J. (2014). Undertaking action research in prison: Developing the Older prisoner Health and Social Care Assessment and Plan. *Action Research*, *12*(2), 136–150. <https://doi.org/10.1177/1476750314524006>
- Wang, E. A., Redmond, N., Dennison Himmelfarb, C. R., Pettit, B., Stern, M., Chen, J., Shero, S., Iturriaga, E., Sorlie, P., & Diez Roux, A. V. (2017). Cardiovascular disease in incarcerated populations. *Journal of the American College of Cardiology*, *69*(24), 2967–2976. <https://doi.org/10.1016/j.jacc.2017.04.040>
- Wildeman, C. (2016). Incarceration and population health in wealthy democracies. *Criminology*, *54*(2), 360–382. <https://doi.org/10.1111/1745-9125.12107>
- Wildeman, C., & Muller, C. (2012). Mass imprisonment and inequality in health and family life. *Annual Review of Law and Social Science*, *8*(1), 11–30. <https://doi.org/10.1146/annurev-lawsocsci-102510-105459>
- Wilper, A. P., Woolhandler, S., Boyd, J. W., Lasser, K. E., McCormick, D., Bor, D. H., & Himmelstein, D. U. (2009). The health and health care of US prisoners: Results of a Nationwide Survey. *American Journal of Public Health*, *99*(4), 666–672. <https://doi.org/10.2105/AJPH.2008.144279>
- Wilson, I. B., & Kaplan, S. (1995). Clinical practice and patients' health status: How are the two related? *Medical Care*, *33*(4 Suppl), AS209–AS214.
- Wilson, J. A., & James, D. C. (2019). Weight loss strategies used by army reserve officer training corps cadets: Implication for student health and wellness services. *Telemedicine and e-Health*, *25*(9), 821–827. <https://doi.org/10.1089/tmj.2018.0174>
- Xiang, J., & Stanley, S. J. (2017). From online to offline: Exploring the role of e-health consumption, patient involvement, and patient-centered communication on perceptions of health care quality. *Computers in Human Behavior*, *70*, 446–452. <https://doi.org/10.1016/j.chb.2016.12.072>
- Yu, S. S. V., Sung, H. E., Mellow, J., & Koenigsmann, C. J. (2015). Self-perceived health improvements among prison inmates. *Journal of Correctional Health Care*, *21*(1), 59–69. <https://doi.org/10.1177/1078345814558048>
- Zeng, Z. (2019). *Jail inmates in 2017* (NCJ 251774). Bureau of Justice Statistics. <https://bjs.ojp.gov/content/pub/pdf/ji17.pdf>

Appendix

Appendix A. Names and Descriptions for Variables in the Prison Data

Variable	Name in PIAAC	Description
Self-rated health	I_Q08	“In general, would you say your health is excellent, very good, good, fair, or poor?”
Sources of health information	I_Q10BUSX2H I_Q10BUSX2F I_Q10BUSX2B I_Q10BUSP2G I_Q10BUSX2E I_Q10BUSX2A I_Q10BUSX2D	“How much information about health issues do you get from: health professionals (doctors/nurses/therapists/psychologists); books or brochures; magazines; social contacts (family members/friends/inmates); television; newspapers; radio”
Prior incarceration	P_Q170	“Before your current incarceration, did you ever serve time in prison, jail, or some other correctional facility?”
Born in the United States	J_Q04A	“Were you born in the United States?”
Prison job	P_Q390	“Do you currently have any prison job?”
Gender	GENDER_R	Respondent's gender
Race	RACETHN_4CAT	Racial/ethnic background
Education	B_Q01A	Highest ISCED level of education
Age	AGEG10LFSEXT	Age in 10-year bands extended to include ages over 65 years (derived)