4-1-2019

Health and criminal justice system involvement among African American siblings

Amber L. Beckley
Duke University

Rohan H. Palmer
Emory University

Michael Rocque
Bates College, mrocque@bates.edu

Keith E. Whitfield
Wayne State University

Recommended Citation

Beckley, A. L., Palmer, R. H., Rocque, M., & Whitfield, K. E. (2019). Health and criminal justice system involvement among African American siblings. Social Science and Medicine - Population Health, 7, 100359-100359. https://doi.org/10.1016/j.ssmph.2019.100359

SSM - Population Health 7 (2019) 100359

Contents lists available at ScienceDirect

SSM - Population Health

journal homepage: www.elsevier.com/locate/ssmph

Article

Health and criminal justice system involvement among African American siblings

Amber L. Beckley[a,b,*], Rohan H. Palmer[c], Michael Rocque[d], Keith E. Whitfield[e]

[a] Department of Psychology and Neuroscience, Duke University, Durham, NC, USA
[b] Demography Unit, Department of Sociology, Stockholm University, Stockholm, Sweden
[c] Behavioral Genetics of Addiction Laboratory, Department of Psychology at Emory University, 36 Eagle Row, Atlanta, GA, USA
[d] Department of Scoiology, Bates College, Lewiston, ME, USA
[e] Wayne State University, Detroit, MI, USA

ARTICLE INFO

Keywords:
Health disparity
criminal justice system
discordant sibling design
offender health

ABSTRACT

Importance: Health disparities between African Americans and Whites have persisted in the United States. Researchers have recently hypothesized that the relatively poor health of African Americans may be caused, in part, by African American overrepresentation in the criminal justice system.
Objectives: To test the hypothesis that criminal justice system involvement is associated with poor health and greater health risk when controlling for unobserved family factors through a discordant sibling design.
Methods: Subjects were drawn from the Carolina African American Twin Study of Aging (CAATSA). Criminal conviction records were extracted from North Carolina's Department of Public Safety. Six measures of health and one measure of health risk were analyzed. The health of convicted respondents was compared to that of unrelated non-convicted respondents matched on childhood and demographic factors ("matched sample"). Convicted respondents were also compared to non-convicted siblings ("discordant sibling sample").
Results: The matched sample included 134 CAATSA respondents. On average, convicted CAATSA respondents, compared to matched non-convicted respondents, were in worse health. Convicted respondents had worse mean self-reported health, worse lung function, more depressive symptoms, and smoked more. The discordant sibling sample included 74 respondents. Convicted siblings and non-convicted siblings had similar self-reported health, depressive symptoms, and smoking. In general, non-convicted siblings were in worse health than non-convicted respondents from the matched sample, implying that poor health runs in families.
Conclusions: This study provided preliminary evidence that some of the association between a criminal record and poor health is confounded by family factors. Though more research is needed to support these results, the study suggests that criminal involvement may not be associated with the surfeit of health problems observed among African Americans. The criminal justice system, nonetheless, could be used to decrease the health disparity.

1. Introduction

In the United States, Whites live longer and healthier lives than African Americans (Frieden, 2013). For example, African Americans, relative to Whites, are about 40% more likely to have hypertension (Ford, Giles, & Dietz, 2002; Gillespie & Hurvitz, 2013) and are more likely to be overweight or obese (Wang & Beydoun, 2007). At the same time, African Americans are overrepresented in the criminal justice system. By early adulthood, African American men, compared to White men, are about 30% more likely to be arrested (Brame, Bushway, Paternoster, & Turner, 2014). Accumulating evidence suggests that the criminal justice system may be a contributing cause to the African American-White health disparity (Schnittker, Massoglia, & Uggen, 2011; Wang & Green, 2010; Wildeman, 2012; Wildeman & Wang, 2017). Researchers have called for more investigation into whether disproportionate involvement in the criminal justice system can explain the racial health disparity (Binswanger, Redmond, Steiner, & Hicks, 2012; Wildeman & Muller, 2012).

The health disparity between people with and without a criminal record extends beyond race. People with a criminal record, regardless of race or ethnicity, tend to die early and be in poor health (e.g., Binswanger et al., 2007; Farrington, 1995; Rosen, Schoenbach, & Wohl,

* Corresponding author at: Department of Sociology, Stockholm University, 106-91 Stockholm, Sweden.
E-mail address: amber.beckley@sociology.su.se (A.L. Beckley).

https://doi.org/10.1016/j.ssmph.2019.100359
Received 9 July 2018; Received in revised form 1 January 2019; Accepted 17 January 2019

2008). Yet, the association between poor health and offending may be caused by common predictors (Barkan & Rocque, 2018; Belsky et al., 2016; Wertz et al., 2018).

Common familial predictors have been shown to be important in understanding the poor health-crime association. In Sweden, for example, poor offender health has been linked to low childhood socioeconomic status and frequent moves (Björkenstam, Hjern, Björkenstam, & Kosidou, 2017; Molero Samuelson, Hodgins, Larsson, Larm, & Tengström, 2010; Stenbacka, Moberg, Romelsjö, & Jokinen, 2012). In the Netherlands, early mortality has been tied to a family history of criminality (van de Weijer, Bijleveld, & Huschek, 2016). US-based research on familial factors associated with health and crime has been hampered by a lack of data. Rarely can childhood socioeconomic status, residential mobility, a family history of crime, adult criminal justice involvement, and adult health be found in the same dataset (for exceptions, see the National Longitudinal Study of Adolescent to Adult Health (Add Health) and the National Longitudinal Survey of Youth, 1979 (NSLY79)).

However, these types of familial factors, and hundreds of others, are typically shared by siblings. Full siblings (i.e., siblings with the same biological parents) tend to be raised in the same home, experience similar parental norms, and similar parental control (Rowe, 1983). Beyond shared environmental risks, siblings also share inherited family health risks through their genes. Sibling studies provide a sample matched on childhood environmental and familial health risks. To use siblings as matched controls, siblings must be discordant on a key "experimental" factor. If siblings are discordant for criminal conviction, but have similar health, it can be presumed that poor health is neither a cause nor consequence of criminal conviction. Past studies using discordant sibling designs have powerfully demonstrated the importance of familial factors. For example, studies comparing discordant siblings have shown that smoking during pregnancy cannot account for offspring criminality (D'Onofrio et al., 2010), that education inequalities in cardiovascular disease are reduced when controlling for familial background (Madsen et al., 2014), and that childhood trauma remains important in explaining psychopathology after controlling for unmeasured familial factors (Brown et al., 2014).

The present study compared health between convicted and non-convicted individuals drawn from a sample of African American twins and non-twin siblings. This study is unique among studies of health and offending among African Americans because it captured previously untested familial factors through a discordant sibling design. This study additionally contributes to the body of knowledge on how the criminal justice system is associated with poor health and the racial health disparity. It does so by being one of the few studies to have utilized individual-level data to understand how the criminal justice system affects the health of African Americans. Finally, whereas many studies have often looked at a single health measure (such as mortality (e.g., Laub & Vaillant, 2000; Nieuwbeerta & Piquero, 2008)), this study considered 6 health measures and 1 health risk.

2. Materials & methods

2.1. Data

Participants were members of the Carolina African American Twin Study of Aging (CAATSA, N = 706; Whitfield, Brandon, Wiggins, Vogler, & McClearn, 2003) which examines childhood characteristics and health status in a sample of African American twins born in North Carolina. Full details about the sample are reported elsewhere (Whitfield, 2013). Briefly, the CAATSA sample was drawn from records of twin births between the years of 1913 and 1975 from 23 vital statistics offices in North Carolina counties, U.S.A. The 23 counties selected represented over 50% of the population and 50% of births in North Carolina. All records of twin births were entered into a computer database. Potential interviewees were located through North Carolina voter registries and telephone directory searches. Interviewees were recruited and all in-person interviews were conducted between March 1999 and June 2003. A total of 706 interviews were conducted. Siblings of the twin pairs (31 pairs, 62 individuals) and surviving members of non-intact twin pairs (72 individuals) comprised approximately 19% of the interviews. All participants gave informed consent, and the study was approved by the Institutional Review Boards of the University of North Carolina Chapel Hill and Pennsylvania State University.

In 2017, public records on criminal conviction in North Carolina, maintained by the North Carolina Department of Public Safety (NCDPS) were searched for members of the CAATSA Study. The NCDPS maintains all records of criminal conviction for offenders sentenced to state prison, jail, and probation in North Carolina since 1972. The age of criminal responsibility in North Carolina is 16 years. Offenses committed prior to 16 years of age are tried in juvenile court. Juvenile court is distinct from criminal court. Juvenile offenders found guilty of an offense are considered "delinquent," which does not result in a record of criminal conviction. Offenders younger than 16 years of age can, in cases of serious crime, have their offense transferred to criminal court where a guilty verdict results in a record of criminal conviction. Public criminal conviction records were matched to the CAATSA data by first and last name and date of birth. The search yielded 48 (6.8%) of CAATSA respondents with a criminal conviction prior to the interview and complete information on all variables. One of the convicted respondents was a non-twin sibling who was retained in the analysis.

2.2. Measures

The exposure of justice system involvement was measured as presence of a record of criminal conviction in the NCDPS system (described above).

Health was assessed using six measures. Self-rated health was reported by respondents. Respondents were asked how they would rate their current health. Response options were as follows: very good, good, ok, poor, very poor. Response options were coded to numerical values (0–4), with higher scores indicating better health (i.e., 0 = very poor, 4 = very good).

Lung function was approximated from peak flow performance. Respondents' peak flow was measured using a Mini-Wright peak flow meter, which measures exhalation speed (liters per minute). To measure exhalation speed, respondents stood, took a deep inhalation, covered the tube of the peak flow meter with their lips, and exhaled as hard as possible. Harder exhalations indicated better performance. Peak flow performance is measured relative to a predicted value based on age, sex, and height (Nunn & Gregg, 1989). The best-of-three measurements for each Study member was used to calculate percentage of predicted peak flow.

Depressive symptoms were assessed using the 11-item Center for Epidemiologic Studies Depression index (CES-D), an abbreviated version of the original 20-item CES-D which has been tested on samples of African Americans (Kohout, Berkman, Evans, & Cornoni-Huntley, 1993; Torres, 2012). The CES-D was designed to assess frequency and severity of depressive symptoms. For each of the 11 symptoms, respondents reported the frequency with which they experienced the symptom during the past week. Response options included: rarely or never, sometimes, occasionally, and most of the time. Response options were coded to numerical values (0–3), with higher scores indicating a greater frequency of symptom experience (i.e., 0 = rarely or never, 3 = most of the time). African Americans tend to report less depression across life than Whites, but tend to have a worse prognosis and rate their depression as more severe (Williams et al., 2007). To capture severity, rather than measuring the presence or absence of depression based upon a threshold score, the measure of depressive symptoms is the summed score of responses.

Body mass index (BMI) was calculated from weight in kilograms (kg) and height (in meters) (BMI = kg/m^2). Each Study member's

weight and height were measured at the time of the interview.

Systolic blood pressure was calculated from the average of 3 seated blood pressure measurements taken at the time of the interview using an oscillometric automated device (A & D model UA-767; Milpitas California).

Physician diagnosis of high blood pressure was based on Study member response to the question, "Have you ever been told by a doctor that you have high blood pressure?" Response options were "yes" or "no." Physician diagnosis of high blood pressure was operationalized as affirmative response to this question.

Smoking behavior, a health risk, was based on Study member response to the question, "Which statement below describes your use of tobacco." Response options were, "I smoke at the present time," "I don't smoke now, but have smoked in the past," and "I have never smoked." Participants who responded with any smoking behavior were asked how many years they smoked. On average, present smokers had smoked for 50% of their life (calculated by years smoked/age) whereas former smokers had only smoked for 20% of life. Results based on life-years-smoked did not substantively differ from results presented below. The three-option use of tobacco response was favored for ease of interpretation. Response options were recoded to numerical values (0–2), with higher scores indicating more smoking (i.e., 0 = never smoked, 2 = present smoker).

We measured two childhood factors. Poor childhood financial well-being as retrospectively reported by respondents when asked, "How well off was your family when you were growing up?" Response options were: very well off, doing well, doing ok, barely getting by, not getting by. A brief example was given after each response option (e.g., barely getting by – had just enough money for bills and food and couldn't buy anything extra). Respondents who reported "barely getting by" or "not getting by" were rated as having poor childhood financial well-being. Childhood health was retrospectively reported by respondents. Response options were: excellent, very good, good, fair, and poor. These were converted to numeric values (0–4), with higher values representing better health.

We measured demographic factors of age in years, sex, and years lived outside of North Carolina as indicated by a response to the question, "How long did you live in a state other than North Carolina?" Childhood and demographic variables were used to create the matched sample.

2.3. Analytic approach

Our analysis compared the health of respondents convicted of a crime to those without a conviction. Non-convicted respondents differed from convicted respondents on health- and crime-associated demographic factors (See Supplementary Material Table S.1). Comparisons of health between justice-system involved and non-justice system involved individuals have often been limited to demographic variables (see Kinner, Forsyth, & Williams, 2013). The CAATSA data additionally included two important childhood predictors of health (childhood financial well-being and childhood health). These demographic and childhood differences were balanced through propensity score matching (results based only on demographic variable matching only were substantively similar are presented in the Supplementary material (Table S.2.)). Propensity scores were generated through logistic regression modeling of offending on childhood financial well-being, childhood health, age, sex, and years lived outside North Carolina. We matched roughly 2 non-convicted respondents for each convicted Study member using nearest neighbor matching within a caliper of 0.20 standard deviations of the propensity score (Austin, 2011; multiple calipers were tested and this caliper provided the best match). The resulting matched sample comprised 134 respondents with complete data on all variables, 89 without a conviction and 45 with a conviction, who were balanced on the demographic variables (see Table 1).

As a further means of controlling for differences in childhood environmental and genetic risks for poor health and criminal conviction, we created a sample of siblings discordant on criminal conviction. As noted above, siblings are matched on hundreds of factors which were not measured (household, health risks, parenting style, etc.). The resulting discordant sibling sample comprised 74 respondents, thirty-seven sibling pairs (32 twin pairs and 5 single twin/non-twin sibling pairs), who were discordant for criminal conviction. Of the 37 sibling pairs discordant for criminal conviction, 17 (46%) were opposite sex pairs. There were significantly more men among the convicted siblings than the non-convicted siblings (Table 1). Across all measures except BMI, women had better health than men (see Supplementary material Table S.3.). This should have increased the chances of detecting differences in health in the discordant sibling sample.

We conducted bivariate analyses in which we compared measures, separately, across non-convicted and convicted respondents. For analyses we used t-tests and chi-squared tests to test the statistical significance of group differences; paired sample t-tests and exact McNemar tests were used for the discordant sibling sample. We sought to replicate results of past research, based on limited control variables, in the first part of our analysis of the matched sample. In the second part of our analysis, we sought to go beyond past research by controlling for a number of other control variables, which were not directly observed, by analyzing siblings discordant for criminal conviction.

3. Results

Our analysis first compared convicted respondents to matched non-convicted respondents (Table 1 [Matched sample]). The threshold for statistical significance was the traditional threshold of $p < .05$. Relative to non-convicted respondents, convicted respondents had significantly poorer mean self-rated health ($p = 0.015$), poorer performance on the peak flow test ($p = 0.001$), more depressive symptoms ($p = 0.004$), and smoked more ($p = 0.005$). Convicted respondents, relative to non-convicted respondents, scored 15–20% lower on self-rated health and peak flow performance (Fig. 1). Convicted respondents, relative to non-convicted respondents, scored roughly 60% higher on depressive symptoms and smoking (Fig. 1). Relative to non-convicted respondents, convicted respondents, had lower mean BMI, but both groups were overweight. Convicted and non-convicted respondents had the same mean systolic blood pressure, as measured during the interview. Convicted respondents were more likely to report physician diagnosis of high blood pressure. In summary, results from the matched sample indicated that convicted respondents, relative to non-convicted respondents, were generally in worse health and at greater risk of health problems, supporting previous research.

To control for the effect of unobserved familial factors on health we analyzed siblings discordant for criminal conviction (Table 1 [Discordant sibling sample] and Fig. 1). Convicted siblings had significantly poorer mean performance on the peak flow test ($p = 0.038$). Across all other health measures, there were no statistically significant differences between convicted siblings and non-convicted siblings.

Fig. 1 also emphasizes how sizable differences in health found in the matched sample decreased in the sibling sample. These results indicate that non-convicted siblings, relative to non-convicted matched respondents, were typically in worse average health.

4. Discussion

Though tentative and in need of replication, this study provides initial evidence on the relationship between adult health and criminal conviction in a sample of African American twins. Consistent with past research comparing demographically similar individuals, our findings showed that people with a criminal conviction, compared to those without a criminal conviction, indeed were in worse health during adulthood (Binswanger et al., 2007; Kjelsberg & Laake, 2010; Nieuwbeerta & Piquero, 2008; Piquero, Daigle, Gibson, Piquero, &

Table 1
Self-reported adult health and adult health risk between non-convicted and convicted members of the CAATSA study in the matched sample and the discordant sibling sample.

	Matched sample				Discordant sibling sample			
	Matched sample (N = 134)	Non-convicted matched respondent (N = 89)	Convicted respondents (N = 45)	*p*	Discordant sibling sample (N = 74)	Non-convicted sibling (N = 37)	Convicted sibling (N = 37)	*p*
Health measures								
Higher scores indicate better health								
Self-rated health, mean (SD)	2.88 (1.03)	3.03 (1.01)	2.58 (1.01)	0.015	2.64 (1.00)	2.68 (0.97)	2.59 (1.04)	0.702
Peak flow performance, mean (SD)	50.48 (15.78)	53.94 (13.74)	43.64 (17.42)	0.001	49.25 (15.96)	53.09 (13.94)[a]	45.18 (17.19)	0.038
Higher scores indicate worse health								
Depression, mean (SD)	5.74 (5.47)	4.78 (5.35)	7.64 (5.25)	0.004	6.64 (4.54)	6.08 (4.18)[a]	7.14 (4.93)	0.330
Body mass index (BMI), mean (SD)	28.44 (6.76)	28.74 (6.17)	27.85 (7.85)	0.508	29.25 (7.85)	30.47 (8.48)[a]	28.03 (7.08)	0.134
Systolic blood pressure, mean (SD)	132.38 (20.33)	132.40 (20.68)	132.34 (19.86)	0.986	131.18 (17.78)	128.61 (15.89)	133.75 (19.36)	0.163
High blood pressure, N (%)	43 (32.1)	26 (29.2%)	17 (37.8%)	0.420	25 (33.8%)	12 (32.4%)	13 (35.1%)	1.000
Health risk								
Higher scores indicate greater health risk								
Smoking, mean (SD)	0.90 (0.85)	0.74 (0.79)	1.20 (0.89)	0.005	1.14 (0.91)	1.03 (0.93)	1.24 (0.89)	0.233
Childhood & demographic factors								
Poor childhood financial well-being, N (%)	27 (20.1%)	18 (20.2%)	9 (20.0%)	1.000	16 (21.6%)	7 (18.9%)	9 (24.3%)	0.754
Childhood health, mean (SD)	3.07 (1.10)	3.08 (1.12)	3.07 (1.07)	0.952	4.12 (0.96)	4.11 (0.88)	4.14 (1.06)	0.891
Age, mean (SD)	44.62 (12.19)	44.88 (13.22)	44.11 (9.95)	0.708	42.53 (10.03)	42.54 (10.19)	42.51 (10.00)	0.911
Male, N (%)	88 (65.7%)	58 (65.2%)	30 (66.7%)	1.000	44 (58.1%)	16 (43.2%)	27 (73.0%)	0.013
Years lived outside North Carolina, mean (SD)	1.53 (3.40)	1.44 (3.60)	1.72 (2.99)	0.640	1.36 (2.92)	1.31 (3.11)[a]	1.44 (2.79)	0.778

p-values for the matched sample are based on t-tests for continuous values and chi-squared tests for percentages.
p-values for discordant twin sample are based on paired-sample t-tests for continuous value and exact McNemar tests for percentages.
[a] Convicted sibling sample N = 36.

Tibbetts, 2007; Piquero, Shepherd, Shepherd, & Farrington, 2011; Rosen et al., 2008). However, our use of a sibling comparison design showed that criminal conviction and poor adult health were generally associated through unobserved factors operating within families. Criminal conviction was, however, associated with lower average peak flow performance. With regard to the African American-White health disparity, our results indicate that criminal conviction seems an unlikely cause. Offenders and non-offenders were similar across many measures after controlling for unobserved family factors.

The present study had several limitations. The proportion of offenders in our sample was low compared to the reported prevalence of criminal conviction in the African American community (Brame, Turner, Paternoster, & Bushway, 2012). It is possible that offenders may have disproportionately died prior to CAATSAs initiation. Offenders may also have been less likely to appear in voter registration records and telephone directories, both of which were used to find respondents. The small number of convicted offenders precluded an analysis of the effect the number of convictions or incarceration; both factors may play a role in health outcomes among offenders and population-wide health disparities (Lee, Wildeman, Wang, Matusko, & Jackson, 2014; Massoglia, 2008; Porter & DeMarco, 2018; Rosen et al., 2008; Schnittker et al., 2011; Wang et al., 2009; Wildeman, 2016; Wildeman & Wang, 2017). The small sample size also prevented further reliable exploration of genetic and environmental influence (Verhulst, 2017).

The small sample size additionally meant that we had diminished ability to detect statistically significant differences in health. As one of the first studies of its kind, we were unable to accurately calculate achieved power because we had no external estimates of effect sizes on which to base such calculations (Gelman & Carlin, 2014). Some of the sample size limitations were overcome by leveraging the familial nature of our sample to create pairs of discordant siblings. While our results are in need of further replication we are conservative in our interpretation of our findings. As such, we have pointed to the generally poor health of non-convicted siblings relative to other non-convicted respondents. Consistent with the idea that poor health operates at the familial level, non-convicted siblings in the discordant sibling model were, with the exception of lung function, in worse health than non-convicted matched respondents. It remains to be seen whether our results will generalize to other African American cohorts or other racial/ethnic groups. We advise that future studies be designed based on low-effect estimates, as were observed in this study.

An additional concern is that our measure of criminal conviction included only conviction by the state of North Carolina. Convictions outside of the jurisdiction of the state of North Carolina (in other states or the federal system) may have occurred. Respondents may have also been involved in crime that went unrecorded. Unrecorded criminal behavior has been linked to poor health (Farrington, 1995; Laub & Vaillant, 2000). Poor health may be associated with criminal offending in general, rather than involvement in the criminal justice system.

Finally, the CAATSA study occurred at only one point in time, limiting our ability to measure health both before and after conviction. We were able to include a retrospective measure of childhood health (Supplementary Material, Table S.2), and the results remained substantively consistent. Ideally, pre-conviction measures of adult health would be desirable to ensure that the health of convicted respondents was not deteriorating at a more rapid rate.

Despite these limitations, this study provides preliminary evidence to the understudied topic of African American offending and health outcomes (Binswanger et al., 2012). Future research using larger sibling samples, controlling for factors beyond basic demographics, or with measures of pre-conviction adult health is needed to test the robustness of the results of this study.

The present findings have implications for public health. Specifically, the results support calls for the criminal justice system to become more involved in efforts to decrease health disparities (Binswanger et al., 2012). The criminal justice system, although

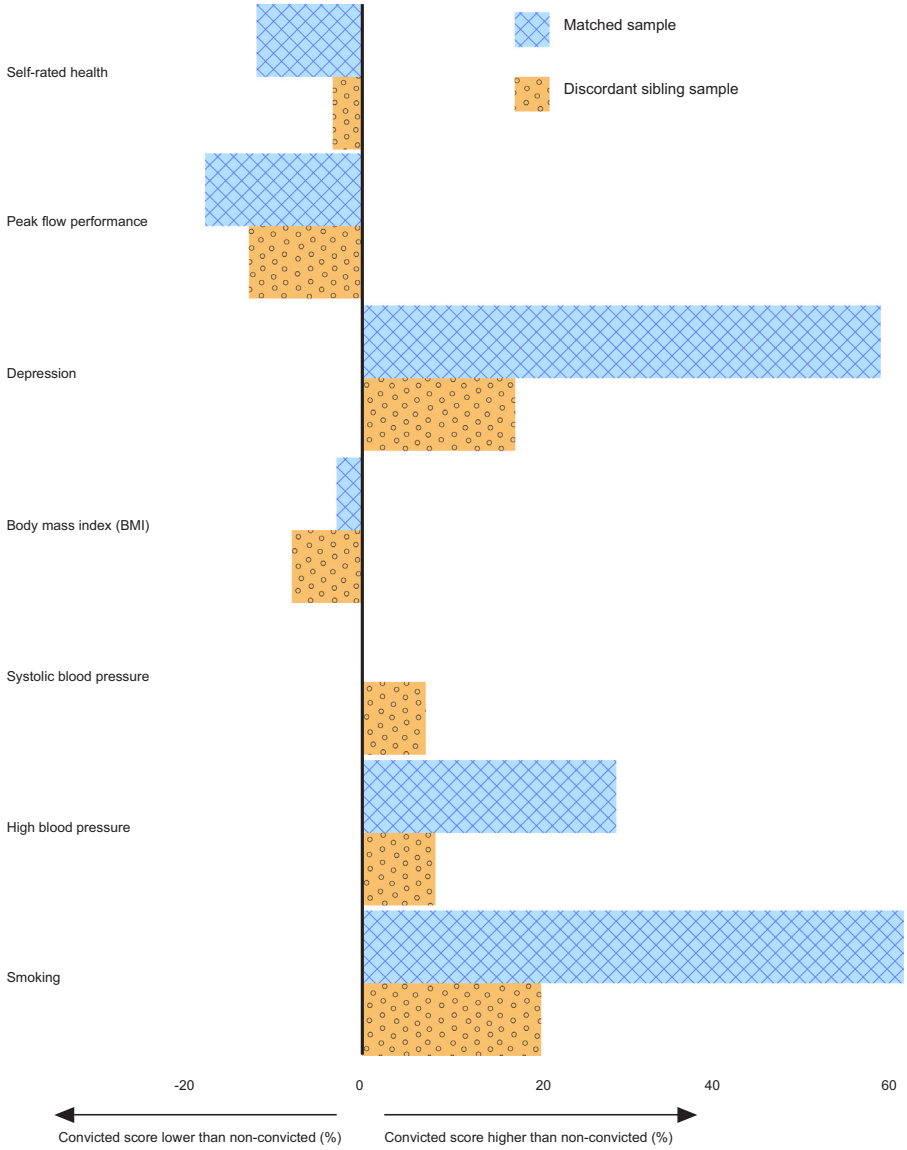

Fig. 1. Relative differences in health outcomes between convicted and non-convicted respondents by sample. The relative differences in health among respondents in the discordant sibling sample, compared to those in the matched sample, were smaller for the outcomes of self-rated health, depression, high blood pressure, and smoking.

perhaps not the cause of racial health disparities, may offer an effective means of reducing racial health disparities by implementing preventive health measures and providing health education to the many incarcerated African Americans, some of whom enter the system with elevated risk for poor health.

In conclusion, we found evidence to support the argument that involvement in the criminal justice system is associated with poorer health, but part of the association may be explained by familial factors. While these results have yet to be replicated in other African American cohorts, as we all as other ethnic/racial groups, improvements to health practices and health education in the criminal justice system may help to address poor health in the African American community.

Acknowledgements

The CAATSA was funded by a grant from the National Institute on Aging, United States (1R01-AG13662-01A2) to Dr. Whitfield. Dr. Beckley is supported by grant 2015-01189 from the Forte Marie Curie International Postdoc Fellowship Programme, Sweden (Seventh Framework Programme).

Appendix A. Supplementary material

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.ssmph.2019.100359.

References

Austin, P. C. (2011). Optimal caliper widths for propensity-score matching when estimating differences in means and differences in proportions in observational studies. *Pharmaceutical Statistics, 10*, 150–161. https://doi.org/10.1002/pst.433.

Barkan, S. E., & Rocque, M. (2018). Socioeconomic status and racism as fundamental causes of street criminality. *Critical Criminology, 26*, 211–231. https://doi.org/10.1007/s10612-018-9387-x.

Belsky, D. W., Moffitt, T. E., Corcoran, D. L., Domingue, B., Harrington, H., Hogan, S., ... Caspi, A. (2016). The genetics of success how single-nucleotide polymorphisms associated with educational attainment relate to life-course development. *Psychological Science,* 957–972. https://doi.org/10.1177/0956797616643070.

Binswanger, I. A., Redmond, N., Steiner, J. F., & Hicks, L. S. (2012). Health disparities and the criminal justice system: An agenda for further research and action. *Journal of Urban Health-Bulletin of the New York Academyof Medicine, 89*, 98–107. https://doi.org/10.1007/s11524-011-9614-1.

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*, 157–165. https://doi.org/10.1056/

NEJMsa064115.
Björkenstam, E., Hjern, A., Björkenstam, C., & Kosidou, K. (2017). Association of cumulative childhood adversity and adolescent violent offending with suicide in early adulthood. *JAMA Psychiatry*. https://doi.org/10.1001/jamapsychiatry.2017.3788.
Brame, R., Bushway, S. D., Paternoster, R., & Turner, M. G. (2014). Demographic patterns of cumulative arrest prevalence by ages 18 and 23. *Crime & Delinquency, 60*, 471–486. https://doi.org/10.1177/0011128713514801.
Brame, R., Turner, M. G., Paternoster, R., & Bushway, S. D. (2012). Cumulative prevalence of arrest from ages 8 to 23 in a national sample. *Pediatrics, 129*, 21–27. https://doi.org/10.1542/peds.2010-3710.
Brown, R. C., Berenz, E. C., Aggen, S. H., Gardner, C. O., Knudsen, G. P., Reichborn-Kjennerud, T., ... Amstadter, A. B. (2014). Trauma exposure and Axis I psychopathology: A cotwin control analysis in Norwegian young adults. *Psychological Trauma: Theory, Research, Practice, and Policy, 6*, 652–660. https://doi.org/10.1037/a0034326.
D'Onofrio, B. M., Singh, A. L., Iliadou, A., Lambe, M., Hultman, C. M., Grann, M., ... Lichtenstein, P. (2010). Familial confounding of the association between maternal smoking during pregnancy and offspring criminality: a population-based study in Sweden. *Archives of General Psychiatry, 67*, 529–538. https://doi.org/10.1001/archgenpsychiatry.2010.33.
Farrington, D. P. (1995). Crime and physical health: Illnesses, injuries, accidents and offending in the Cambridge Study. *Criminal Behaviour and Mental Health, 5*, 261–278. https://doi.org/10.1002/cbm.1995.5.4.261.
Ford, E. S., Giles, W. H., & Dietz, W. H. (2002). Prevalence of the metabolic syndrome among US adults: Findings from the third National Health and Nutrition Examination Survey. *JAMA, 287*, 356–359. https://doi.org/10.1001/jama.287.3.356.
Frieden, T. R. (2013). CDC health disparities and inequalities report - United States, 2013. *Foreword MMWR Suppl, 62*, 1–2.
Gelman, A., & Carlin, J. (2014). Beyond power calculations: Assessing Type S (Sign) and Type M (Magnitude) errors. *Perspectives on Psychological Science, 9*, 641–651. https://doi.org/10.1177/1745691614551642.
Gillespie, C. D., & Hurvitz, K. A. (2013). Prevalence of hypertension and controlled hypertension - United States, 2007–2010. *MMWR Suppl, 62*, 144–148.
Kinner, S. A., Forsyth, S., & Williams, G. (2013). Systematic review of record linkage studies of mortality in ex-prisoners: Why (good) methods matter. *Addiction, 108*, 38–49. https://doi.org/10.1111/add.12010.
Kjelsberg, E., & Laake, P. (2010). Is the high mortality risk in sentenced offenders independent of previous imprisonment? *European Journal of Epidemiology, 25*, 237–243. https://doi.org/10.1007/s10654-010-9436-6.
Kohout, F. J., Berkman, L. F., Evans, D. A., & Cornoni-Huntley, J. (1993). Two shorter forms of the CES-D depression symptoms index. *Journal of Aging and Health, 5*, 179–193. https://doi.org/10.1177/089826439300500202.
Laub, J. H., & Vaillant, G. E. (2000). Delinquency and mortality: A 50-year follow-up study of 1000 delinquent and nondelinquent boys. *American Journal of Psychiatry, 157*, 96–102. https://doi.org/10.1176/ajp.157.1.96.
Lee, H., Wildeman, C., Wang, E. A., Matusko, N., & Jackson, J. S. (2014). A heavy burden: The cardiovascular health consequences of having a family member incarcerated. *American Journal of Public Health, 104*, 421–427. https://doi.org/10.2105/AJPH.2013.301504.
Madsen, M., Andersen, P. K., Gerster, M., Andersen, A.-M. N., Christensen, K., & Osler, M. (2014). Are the educational differences in incidence of cardiovascular disease explained by underlying familial factors? A twin study. *Social Science & Medicine, 118*, 182–190. https://doi.org/10.1016/j.socscimed.2014.04.016.
Massoglia, M. (2008). Incarceration, health, and racial disparities in health. *Law and Society Review, 42*, 275–306.
Molero Samuelson, Y., Hodgins, S., Larsson, A., Larm, P., & Tengström, A. (2010). Adolescent antisocial behavior as predictor of adverse outcomes to Age 50: A follow-up study of 1,947 individuals. *Criminal Justice and Behavior, 37*, 158–174. https://doi.org/10.1177/0093854809350902.
Nieuwbeerta, P., & Piquero, A. R. (2008). Mortality rates and causes of death of convicted Dutch criminals 25 years later. *Journal of Research in Crime and Delinquency, 45*, 256–286. https://doi.org/10.1177/0022427808317573.
Nunn, A. J., & Gregg, I. (1989). New regression equations for predicting peak expiratory flow in adults. *BMJ, 298*, 1068–1070. https://doi.org/10.1136/bmj.298.6680.1068.
Piquero, A. R., Daigle, L. E., Gibson, C., Piquero, N. L., & Tibbetts, S. G. (2007). Research note: Are life-course-persistent offenders at risk for adverse health outcomes? *Journal of Research in Crime and Delinquency, 44*, 185–207. https://doi.org/10.1177/0022427806297739.
Piquero, A. R., Shepherd, I., Shepherd, J. P., & Farrington, D. P. (2011). Impact of offending trajectories on health: Disability, hospitalisation and death in middle-aged men in the Cambridge Study in Delinquent Development. *Criminal Behaviour and Mental Health, 21*, 189–201. https://doi.org/10.1002/cbm.810.
Porter, L. C., & DeMarco, L. M. (2018). Beyond the dichotomy: Incarceration dosage and mental health. *Criminology*. https://doi.org/10.1111/1745-9125.12199.
Rosen, D. L., Schoenbach, V. J., & Wohl, D. A. (2008). All-cause and cause-specific mortality among men released from state prison, 1980–2005. *American Journal of Public Health, 98*, 2278–2284. https://doi.org/10.2105/AJPH.2007.121855.
Rowe, D. C. (1983). A biometrical analysis of perceptions of family environment: A study of twin and singleton sibling kinships. *Child Development, 54*, 416–423. https://doi.org/10.2307/1129702.
Schnittker, J., Massoglia, M., & Uggen, C. (2011). Incarceration and the health of the African American community. *Du Bois Review: Social Science Research on Race, 8*, 133–141. https://doi.org/10.1017/S1742058X11000026.
Stenbacka, M., Moberg, T., Romelsjö, A., & Jokinen, J. (2012). Mortality and causes of death among violent offenders and victims-a Swedish population based longitudinal study. *BMC Public Health, 12*, 38. https://doi.org/10.1186/1471-2458-12-38.
Torres, E. R. (2012). Psychometric properties of the Center for Epidemiologic Studies Depression Scale in African-American and Black Caribbean adults. *Issues in Mental Health Nursing, 33*, 687–696. https://doi.org/10.3109/01612840.2012.697534.
van de Weijer, S., Bijleveld, C., & Huschek, D. (2016). Offending and mortality. *Advances in Life Course Research, 28*, 91–99. https://doi.org/10.1016/j.alcr.2015.11.004 (Special issue on Criminal Careers and Demographic Outcomes: A life-course perspective).
Verhulst, B. (2017). A power calculator for the classical twin design. *Behavior Genetics, 47*, 255–261. https://doi.org/10.1007/s10519-016-9828-9.
Wang, E. A., & Green, J. (2010). Incarceration as a key variable in racial disparities of asthma prevalence. *BMC Public Health, 10*, 290. https://doi.org/10.1186/1471-2458-10-290.
Wang, E. A., Pletcher, M., Lin, F., Vittinghoff, E., Kertesz, S. G., Kiefe, C. I., & Bibbins-Domingo, K. (2009). Incarceration, incident hypertension, and access to health care: Findings from the Coronary Artery Risk Development in Young Adults (CARDIA) study. *Archives of Internal Medicine, 169*, 687–693. https://doi.org/10.1001/archinternmed.2009.26.
Wang, Y., & Beydoun, M. A. (2007). The obesity epidemic in the United States—gender, age, socioeconomic, racial/ethnic, and geographic characteristics: A systematic review and meta-regression analysis. *Epidemiologic Reviews, 29*, 6–28. https://doi.org/10.1093/epirev/mxm007.
Wertz, J., Caspi, A., Belsky, D. W., Beckley, A. L., Arseneault, L., Barnes, J. C., ... Moffitt, T. E. (2018). Genetics and crime: Integrating new genomic discoveries into psychological research about antisocial behavior. *Psychol Sci, 29*, 791–803. https://doi.org/10.1177/0956797617744542.
Whitfield, K. E. (2013). A registry of adult African American twins: The Carolina African American Twin Study of Aging. *Twin Research and Human Genetics, 16*, 476–480. https://doi.org/10.1017/thg.2012.79.
Whitfield, K. E., Brandon, D. T., Wiggins, S., Vogler, G., & McClearn, G. (2003). Does intact pair status matter in the study of African American Twins? The Carolina African American Twin Study of Aging. *Experimental Aging Research, 29*, 407–423. https://doi.org/10.1080/03610730303699.
Wildeman, C. (2016). Incarceration and population health in wealthy democracies. *Criminology, 54*, 360–382. https://doi.org/10.1111/1745-9125.12107.
Wildeman, C. (2012). Imprisonment and (inequality in) population health. *Social Science Research, 41*, 74–91. https://doi.org/10.1016/j.ssresearch.2011.07.006.
Wildeman, C., & Muller, C. (2012). Mass imprisonment and inequality in health and family life. *Annual Review of Law and Social Science, 8*, 11–30. https://doi.org/10.1146/annurev-lawsocsci-102510-105459.
Wildeman, C., & Wang, E. A. (2017). Mass incarceration, public health, and widening inequality in the USA. *The Lancet, 389*, 1464–1474. https://doi.org/10.1016/S0140-6736(17)30259-3.
Williams, D. R., González, H. M., Neighbors, H., Nesse, R., Abelson, J. M., Sweetman, J., & Jackson, J. S. (2007). Prevalence and distribution of major depressive disorder in African Americans, Caribbean Blacks, and Non-Hispanic Whites: Results from the National Survey of American Life. *Archives of General Psychiatry, 64*, 305–315. https://doi.org/10.1001/archpsyc.64.3.305.

Update

SSM - Population Health

Volume 12, Issue , December 2020, Page

DOI: https://doi.org/10.1016/j.ssmph.2020.100713

SSM - Population Health 12 (2020) 100713

Contents lists available at ScienceDirect

SSM - Population Health

journal homepage: http://www.elsevier.com/locate/ssmph

Erratum

Erratum regarding missing Declaration of Competing Interest statements in previously published articles

Declaration of Competing Interest statements were not included in the published version of the following articles that appeared in previous issues of SSM - Population Health.

The appropriate Declaration/Competing Interest statements, provided by the Authors, are included below.

1. The socio-economic distribution of exposure to Ebola: Survey evidence from Liberia and Sierra Leone (SSM - Population Health, 2019; 10C) https://doi.org/10.1016/j.ssmph.2019.100472 The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.
2. Lifestyle clusters and academic achievement in Australian Indigenous children: Empirical findings and discussion of ecological levers for closing the gap (SSM - Population Health, 2020; 10C) https://doi.org/10.1016/j.ssmph.2019.100535 The authors were contacted after publication to request a Declaration of Interest statement.
3. Health and criminal justice system involvement among African American siblings (SSM - Population Health, 2019; 7C) https://doi.org/10.1016/j.ssmph.2019.100359 The authors were contacted after publication to request a Declaration of Interest statement.
4. Relationships between psychological distress and health behaviors among Canadian adults: Differences based on gender, income, education, immigrant status, and ethnicity (SSM - Population Health, 2019; 7C) https://doi.org/10.1016/j.ssmph.2019.100385 The authors were contacted after publication to request a Declaration of Interest statement.
5. Partner resources and incidence and survival in two major causes of death (SSM - Population Health, 2018; 4C: 271–279) https://doi.org/10.1016/j.ssmph.2018.03.001 The authors were contacted after publication to request a Declaration of Interest statement.
6. Womenâ€™s spousal choices and a manâ€™s handshake: Evidence from a Norwegian study of cohort differences (SSM - Population Health, 2018; 5C:1–7) https://doi.org/10.1016/j.ssmph.2018.04.004 The authors were contacted after publication to request a Declaration of Interest statement.
7. Early-life exposure to weather shocks and child height: Evidence from industrializing Japan (SSM - Population Health, 2018; 7C) https://doi.org/10.1016/j.ssmph.2018.11.001 The authors were contacted after publication to request a Declaration of Interest statement.
8. A principles framework for taking action on MÄori/Indigenous Homelessness in Aotearoa/New Zealand (SSM - Population Health, 2019; 8C) https://doi.org/10.1016/j.ssmph.2019.100450 The authors were contacted after publication to request a Declaration of Interest statement.
9. Ecological zone and symptoms of acute respiratory infection among children under five in Ghana: 1993â€“2014 (SSM - Population Health, 2019; 8C) https://doi.org/10.1016/j.ssmph.2019.100414 The authors were contacted after publication to request a Declaration of Interest statement.
10. Education and fertility in Egypt: Mediation by women's empowerment (SSM - Population Health, 2020; 9C) https://doi.org/10.1016/j.ssmph.2019.100488 The authors were contacted after publication to request a Declaration of Interest statement.
11. Interplay of subjective and objective economic well-being on the mental health of Norwegian adolescents (SSM - Population Health, 2019; 9C) https://doi.org/10.1016/j.ssmph.2019.100471 The authors were contacted after publication to request a Declaration of Interest statement.
12. Obesity among black women in food deserts: An â€œomnibusâ€ test of differential risk (SSM - Population Health, 2019; 7C) https://doi.org/10.1016/j.ssmph.2019.100363 The authors were contacted after publication to request a Declaration of Interest statement.
13. The Great Recession and adverse birth outcomes: Evidence from California, USA (SSM - Population Health, 2019; 9C) https://doi.org/10.1016/j.ssmph.2019.100470 The authors were contacted after publication to request a Declaration of Interest statement.
14. The best of intentions: Prenatal breastfeeding intentions and infant health (SSM - Population Health, 2018; 5C:86–100) https://doi.org/10.1016/j.ssmph.2018.05.002 The authors were

DOIs of original article: https://doi.org/10.1016/j.ssmph.2018.05.002, https://doi.org/10.1016/j.ssmph.2019.100359, https://doi.org/10.1016/j.ssmph.2019.100488, https://doi.org/10.1016/j.ssmph.2019.100471, https://doi.org/10.1016/j.ssmph.2019.100363, https://doi.org/10.1016/j.ssmph.2019.100470, https://doi.org/10.1016/j.ssmph.2019.100501, https://doi.org/10.1016/j.ssmph.2018.04.004, https://doi.org/10.1016/j.ssmph.2019.100535, https://doi.org/10.1016/j.ssmph.2019.100472, https://doi.org/10.1016/j.ssmph.2018.03.001, https://doi.org/10.1016/j.ssmph.2018.11.001, https://doi.org/10.1016/j.ssmph.2019.100450, https://doi.org/10.1016/j.ssmph.2019.100414, https://doi.org/10.1016/j.ssmph.2019.100385.

https://doi.org/10.1016/j.ssmph.2020.100713

Available online 10 December 2020

contacted after publication to request a Declaration of Interest statement.
15. Caregiving time costs and trade-offs: Gender differences in Sweden, the UK, and Canada (SSM - Population Health, 2019; 9C) https://doi.org/10.1016/j.ssmph.2019.100501 The authors were contacted after publication to request a Declaration of Interest statement.