

Health Status of Females Who Experience Incarceration: A Population-Based Retrospective Cohort Study

Emily Norris, BHSc,¹ Matilda Kim, BHSc,¹ Beverley Osei, BHSc,²
Kinwah Fung, MSc,³ and Fiona G. Kouyoumdjian, MD, PhD^{3,4}

Abstract

Background: People who experience incarceration have poor health across a variety of indicators, but we lack population-level data on the health of females in particular. We examined the health status of females released from provincial prison, and compared their data with data for males released from provincial prison and females in the general population in Ontario, Canada in 2010.

Methods: We conducted a retrospective cohort study using linked correctional and health administrative data. We compared sociodemographic data, morbidity, mortality, and use of health care for (1) females released from provincial prison in 2010, (2) males released from provincial prison in 2010, and (3) age-matched females in the general population.

Results: Females in the incarceration group ($N=6,107$) were more likely to have higher morbidity and specific psychiatric conditions compared with the male incarceration group ($N=42,754$) and the female general population group ($N=24,428$). Their mortality rate postrelease was several times higher than that for the female general population group. They used primary care more often than both comparator groups across all time periods, and they used emergency departments more often compared with the female general population group and in most periods postrelease compared with the male incarceration group. They also tended to have higher rates of medical-surgical and psychiatric hospitalization.

Conclusion: Females who experience incarceration have worse health overall than males who experience incarceration and females in the general population. Efforts should be made to reform programs and policies in the criminal justice and health care systems to support and promote health for females who experience incarceration.

Keywords: females, women, prison, jail, incarceration, health, Ontario

Introduction

EVIDENCE HAS SHOWN that people who experience incarceration, on average, have worse health than the rest of the population, with higher rates of mental illness and addictions, self-harm and suicide, and communicable and chronic diseases.^{1–6} Health status is particularly poor in the early days after release, as indicated by high rates of death, hospitalization, and emergency department use for high acuity issues.^{1,3} Improving the health of people who experience incarceration should be a policy and programmatic priority to redress population-level health inequity, and could prevent recidivism, improve public safety, reduce unnecessary health care costs, and prevent communicable disease transmission.⁷

While far fewer females than males experience incarceration, evidence indicates that females who experience incarceration tend to have worse physical and mental health.^{1,8,9} Overall, there is a paucity of information on the health status of females who experience incarceration. Existing research has frequently focused on specific aspects of health such as reproductive health and mental illness,^{9,10} and is limited by its recency,^{1,10,11} reliance on self-reported data,¹ lack of large and population-based samples,¹¹ and lack of comparator data for the general population.^{1,10,11} We need recent, population-level health status data with relevant comparator groups to justify focusing resources on this population and setting and to support priority setting for targeted efforts to improve population health in prison and in the community.

¹Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Canada.

²Temerty Faculty of Medicine, University of Toronto, Toronto, Canada.

³ICES, Toronto, Canada.

⁴Department of Family Medicine, McMaster University, Hamilton, Canada.

In this study, we used available health administrative data to examine indicators of the health status of females who were released from provincial prisons in Ontario in 2010. We compared data on sociodemographic characteristics, morbidity, mortality, and health care use with data for males who experienced incarceration and for age-matched females in the general population.

Methods

Context

We conducted this study in Ontario, Canada, and included data for all 26 provincial prisons. In this article, we use the term provincial prison for all provincial correctional facilities, including jails, detention centers, and correctional centers, and the term incarceration to include people who are detained or incarcerated.

Ontario provincial prisons hold people awaiting trial or sentencing and people sentenced to <2 years in custody. Provincial prisons are publicly funded and overseen by the Ministry of the Solicitor General. In 2010/2011, the average daily count of people in provincial prisons was 8,731.¹²

Ontario residents, including those in provincial prisons, have hospitalizations and medically necessary physician services paid for through the publicly funded Ontario Health Insurance Plan (OHIP) system. At the time of prison admission, people are routinely assessed by a nurse. They are then seen by a physician or nurse practitioner in the ensuing weeks or sooner if medically indicated. Prescribed medications are paid for by the Ministry of the Solicitor General while in prison. In the community, certain people have prescribed medications paid for by the provincial government, including based on age, financial need and employment status, or disability.¹³

Study design

We conducted a retrospective population-based cohort study of all people released from provincial prisons in Ontario in 2010 and age-matched females in the general population.

Participants

We used correctional and health data that were linked for a related study.¹⁴ In brief, data on all adults released from provincial prison in Ontario in 2010 were provided by the Ontario Ministry of the Solicitor General, including name, date of birth, sex, self-reported race, OHIP number, and dates of prison admission and release, and reasons for release between 2005 and 2015. The data were transferred to ICES, an independent organization funded by the Ontario Ministry of Health, which holds health administrative data for Ontario residents and linked as described previously.¹⁴

For every female released from provincial prison, four age-matched females were randomly selected from the Registered Persons Database, which includes information for all people in Ontario who are eligible for OHIP coverage. We considered females released from provincial prison to be the exposed group, and we called this group the *female incarceration group*. The unexposed groups were men released from provincial prison, called the *male incarceration group*, and age-matched females from the general population, called the *female general population group*.

Throughout this article, we refer to the two groups of incarcerated people as female or male. We did not have access to data on gender. We used sex-based terminology except when referring to populations in cited references that used gender-based terminology.

Variables

We derived neighborhood income quintile based on the postal code at time of prison admission or at the analogous time for people in the female general population group. Race was self-reported by people in the two incarceration groups; we retained categories from the Ministry of the Solicitor General ("Aboriginal" used for people who are Indigenous). Race data were not available for the female general population group.

We accessed data on morbidity at time of initial release from provincial prison in 2010 and on the corresponding date for those in the female general population group. We selected medical conditions with validated case definitions, that is, diabetes, hypertension, chronic obstructive pulmonary disease, asthma, and HIV infection, based on ambulatory care data (OHIP), emergency department data (National Ambulatory Care Reporting System, or NACRS), and hospital admissions data (Canada Institute for Health Information Discharge Abstract Database, or DAD, and Ontario Mental Health Reporting System, or OMHRS).^{15–19} We assessed mental illness diagnoses using definitions from the Ontario Mental Health and Addictions Scorecard and Evaluation Framework,²⁰ that is, for mood disorders, schizophrenia, substance-related disorders, and anxiety disorders using OHIP, NACRS, DAD, and OMHRS data.²¹ We applied the Johns Hopkins Adjusted Clinical Groups System to each person to assess past year number of aggregated diagnosis groups (ADGs),^{22,23} as an indicator of morbidity burden.^{22,23} We accessed data on deaths from the Registered Persons Database. For health care utilization, we examined primary care visits, emergency department visits, medical-surgical hospitalizations, and psychiatric hospitalizations.

Analysis

We followed people from the date of prison admission leading to the first release in 2010 for people in the incarceration groups or the corresponding dates for each matched person in the female general population group. We ended the follow-up period at the earliest of death, loss of OHIP eligibility, readmission to provincial prison for the incarceration groups, or 730 days after the date of release or the corresponding date in the female general population group. We calculated person-time at risk as the amount of time between the prison admission and the end of the follow-up period. For the incarceration groups, we did not include any subsequent incarcerations.

We examined health care use by period under study, that is, in prison, and during days 0–6, 7–29, 30–89, 90–179, 180–364, and 365–730 after release or the corresponding dates for people in the female general population group, and by type of health care. We calculated health care use rates for each health care type and period by dividing the number of encounters or admissions for each type of health care by the person-years (PYs) at risk. We calculated mortality rates for the same time periods, except not for the period in prison since we had included only people who were alive at the time of release.

TABLE 1. SOCIODEMOGRAPHIC DATA AND MORBIDITY OF FEMALES AND MALES RELEASED FROM PROVINCIAL PRISON AND FEMALES IN THE GENERAL POPULATION IN ONTARIO IN 2010

Characteristic	Standardized difference for female incarceration group ^a			
	Female incarceration group, N = 6,107	Male incarceration group, N = 42,754	Female general population group, N = 24,428	vs. female general population group
Age, median years (IQR)	33 (23–44)	34 (22–46)	33 (23–44)	0.04
Race (%)	15.3%	9.1%	Not available	0.19
Unknown	16.0%	9.3%		0.20
Aboriginal	6.7%	12.1%		0.18
Black	56.4%	59.2%		0.06
White	5.6%	10.3%		0.17
Other	41.0%	36.6%	20.0%	0.09
Neighborhood income quintile (%)	21.0%	21.5%	20.0%	0.01
First (lowest)	13.8%	16.1%	20.0%	0.06
Second	10.5%	12.4%	20.5%	0.06
Third	8.2%	8.9%	19.1%	0.02
Fourth	6 (3–20)	11 (3–59)	Not applicable	0.35
Fifth				Not applicable
Time in provincial prison, ^b median days (IQR)				
ADGs	7 (4–10)	4 (2–7)	5 (2–7)	0.52
Median (IQR)	32.1%	54.8%	48.4%	0.47
0–4	42.7%	34.6%	42.9%	0.17
5–9	25.2%	10.6%	8.7%	0.39
≥10	4.7%	4.8%	3.6%	0.01
Chronic disease prevalence (%)	6.3%	7.6%	6.9%	0.05
Diabetes	5.8%	4.3%	1.7%	0.07
Hypertension	23.8%	15.3%	15.2%	0.21
COPD	1.0	0.6	0.1	0.04
Asthma	13.5	5.8	1.0	0.26
HIV prevalence (%)	5.9	3.6	0.2	0.11
Mental illness prevalence (%)	28.5	15.3	0.7	0.32
Substance use disorder				
Anxiety disorder	14.9	6.7	1.7	0.27

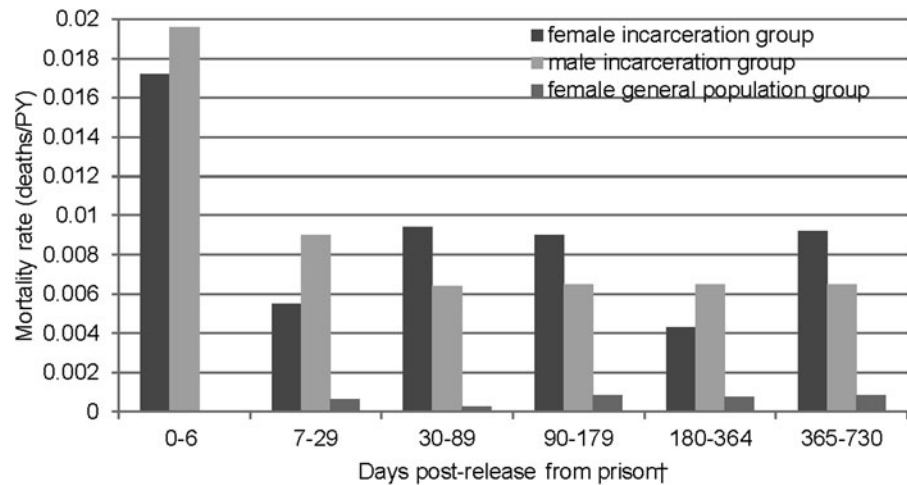
The female general population group was matched by age to the female incarceration group.

^aWe considered a standardized difference of 0.10 or greater meaningful.

^bDuring the incarceration leading to initial release in 2010.

ADGs, aggregated diagnosis groups; COPD, chronic obstructive pulmonary disease; IQR, interquartile range.

FIG. 1. Rates of death (deaths/PY) for males and females released from provincial prison and females in the general population* in Ontario in 2010, by days postrelease from prison†. *The female general population group was matched by age to the female incarceration group. †For the incarceration leading to initial release in 2010, or the corresponding period for the female general population group. There were no deaths in the female general population group during the period corresponding to 0–6 days postrelease. PY, person-year.



To assess for between-group differences in prevalence and rates, we used standardized differences, also referred to as the “effect size,”²⁴ and we considered a difference of 0.10 or greater to be meaningful, suggesting a nonnegligible difference between groups.²⁵ We also calculated unadjusted rate ratios for mortality rates and for each type of health care use for the female incarceration group compared with the male incarceration group and the female general population group, respectively. We used generalized estimating equations with a negative binomial model, and we controlled for correlation due to matching.

Approval was received from the St. Michael’s Hospital Research Ethics Board and the Hamilton Integrated Research Ethics Board.

Results

We included 6,107 females and 42,754 males who were released from provincial prison in 2010, and 24,428 females who were matched by age to females in the incarceration group. Total PYs of follow-up for each group are shown in Supplementary Appendix S1.

Sociodemographic data, morbidity, and mortality

The age distribution was similar across groups, with a median age of 33 or 34 years (Table 1). More people in the two incarceration groups lived in neighborhoods in each of the lowest two income quintiles compared with the female general population group. The median number of ADGs, the prevalence of asthma, and the prevalence of each of the psychiatric conditions examined was higher for the female incarceration group compared with both other groups. The prevalence of HIV was higher in the female incarceration group compared with the female general population group. The median length of incarceration leading to initial release in 2010 was 6 days (interquartile range [IQR] 3–20) for the female incarceration group, which was shorter than the median length of incarceration for the male incarceration group, which was 11 days (IQR 3–59).

Mortality rates were similar between the female and male incarceration groups, and highest in the week after release of all the postrelease periods (Supplementary Appendix S2 and Fig. 1). The mortality rate was consistently higher for the female incarceration group compared with the female general population group, although the difference was significant only in the period of 365–730 days postrelease.

TABLE 2. RATES OF PRIMARY CARE USE (VISITS/PY) FOR MALES AND FEMALES RELEASED FROM PROVINCIAL PRISON AND FEMALES IN THE GENERAL POPULATION IN ONTARIO IN 2010

Period relative to time in prison ^a		Female incarceration group, N=6,107	Male incarceration group, N=42,754	Female general population group, ^b N=24,428	Standardized difference ^c for female incarceration group	
					vs. male incarceration group	vs. female general population group
In prison		19.1	11.7	3.8	0.10	0.52
Postrelease	0–6	12.2	8.2	3.9	0.12	0.34
	7–29	10.6	6.0	3.9	0.23	0.36
(days)	30–89	10.1	5.5	3.8	0.28	0.37
	90–179	10.4	5.4	3.8	0.34	0.39
	180–364	11.1	5.6	3.9	0.40	0.41
	365–730	10.9	5.6	3.8	0.49	0.47

^aFor the incarceration leading to initial release in 2010, or the corresponding period for the female general population group.

^bThe female general population group was matched by age to the female incarceration group.

^cWe considered a standardized difference of 0.10 or greater meaningful.
PY, person-year.

TABLE 3. RATES OF EMERGENCY DEPARTMENT VISITS (VISITS/PY) FOR MALES AND FEMALES RELEASED FROM PROVINCIAL PRISON AND FEMALES IN THE GENERAL POPULATION IN ONTARIO IN 2010

Period relative to time in prison ^a		Female incarceration group, N=6,107	Male incarceration group, N=42,754	Female general population group, ^b N=24,428	Standardized difference ^c for female incarceration group	
					vs. male incarceration group	vs. female general population group
In prison		1.3	0.6	0.40	0.02	0.24
Postrelease	0–6	3.3	2.5	0.38	0.07	0.26
(days)	7–29	2.5	1.6	0.40	0.15	0.28
	30–89	2.3	1.3	0.39	0.21	0.34
	90–179	2.1	1.2	0.39	0.23	0.34
	180–364	1.9	1.1	0.40	0.24	0.36
	365–730	1.7	1.0	0.42	0.29	0.40

^aFor the incarceration leading to initial release in 2010, or for the corresponding period for the female general population group.

^bThe female general population group was matched by age to the female incarceration group.

^cWe considered a standardized difference of 0.10 or greater meaningful.

Primary care use

The female incarceration group had high rates of primary care use in all time periods, at a rate of 19.1 visits/PY in custody and over 10 visits/PY across periods postrelease. Rates of use for this group were significantly higher than rates in the male incarceration group and the female general population group (Table 2). For the female incarceration group, the rate of primary care use decreased substantially upon release, from 19.1 to 12.2 visits/PY.

Emergency department use

The female incarceration group accessed the emergency department at a rate of 1.3 visits/PY while incarcerated, compared to 0.6 visits/PY for the male incarceration group

and 0.40 visits/PY for the female general population group (Table 3). Emergency department use increased in the first 6 days after release, to 3.3 visits/PY. Emergency department use was significantly higher for the female incarceration group across all postrelease time periods compared with the female general population group and in most postrelease time periods compared with the male incarceration group.

Medical-surgical and psychiatric hospitalization

The psychiatric hospitalization rate for the female incarceration group was 0.22 admissions/PY while incarcerated, compared with 0.08 admissions/PY for the male incarceration group and 0.0012 admissions/PY for the female general population group (Table 4). Rates of psychiatric hospitalization

TABLE 4. RATES OF MEDICAL-SURGICAL AND PSYCHIATRIC HOSPITALIZATION (ADMISSIONS/PY) FOR MALES AND FEMALES RELEASED FROM PROVINCIAL PRISON AND FEMALES IN THE GENERAL POPULATION IN ONTARIO IN 2010

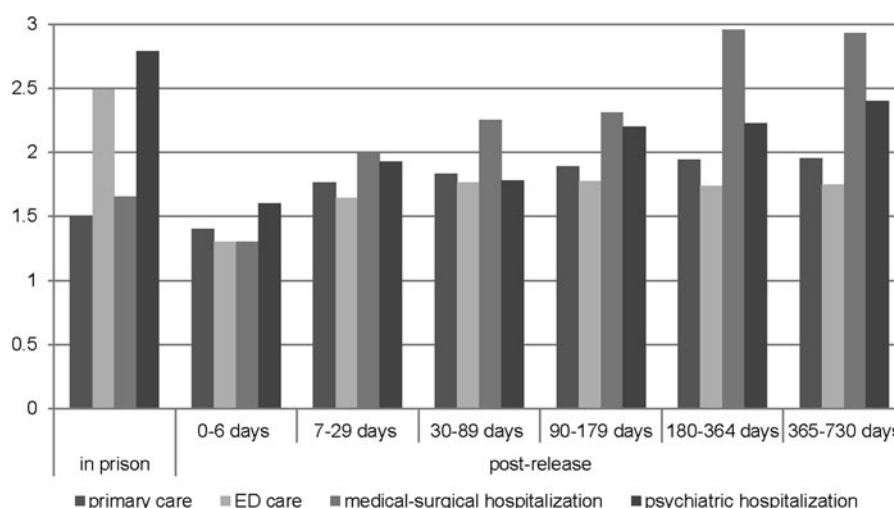
Hospitalization		Period relative to time in prison ^a	Female incarceration group, N=6,107	Male incarceration group, N=42,754	Female general population group, ^b N=24,428	Standardized difference ^c for female incarceration group	
						vs. male incarceration group	vs. female general population group
Psychiatric	In prison		0.22	0.08	0.0012	0.03	0.08
	Postrelease	0–6	0.26	0.16	0.0085	0.03	0.09
	(days)	7–29	0.14	0.07	0.0052	0.04	0.10
		30–89	0.09	0.05	0.0055	0.05	0.11
		90–179	0.09	0.04	0.0042	0.07	0.14
		180–364	0.08	0.04	0.0043	0.1	0.18
		365–730	0.07	0.03	0.0049	0.12	0.19
Medical-surgical	In prison		0.09	0.05	0.08	0.02	0.01
	Postrelease	0–6	0.15	0.12	0.05	0.00	0.04
	(days)	7–29	0.17	0.09	0.08	0.05	0.06
		30–89	0.18	0.08	0.06	0.10	0.12
		90–179	0.17	0.08	0.07	0.13	0.12
		180–364	0.21	0.07	0.07	0.23	0.17
		365–730	0.20	0.07	0.07	0.30	0.24

^aFor the incarceration leading to initial release in 2010, or for the corresponding period for the female general population group.

^bThe female general population group was matched by age to the female incarceration group.

^cWe considered a standardized difference of 0.10 or greater meaningful.

FIG. 2. Unadjusted relative rate ratios of health care use for females released from provincial prison and males released from provincial prison in Ontario in 2010, by period relative to time in prison* and health care type. *For the incarceration leading to initial release in 2010.



were higher in the female incarceration group than the female general population group, with a significant standardized difference for most postrelease periods.

There was no significant difference in medical-surgical hospitalization rates between groups during the period in prison, but the rates were significantly higher for the female incarceration group compared with the other two groups for most postrelease periods (Table 4). There was a substantial increase in the medical-surgical admission rate from the time in prison to the week postrelease, from 0.09 to 0.15 admission/PY.

Relative rate ratios for health care use for the female incarceration group compared with the other two groups

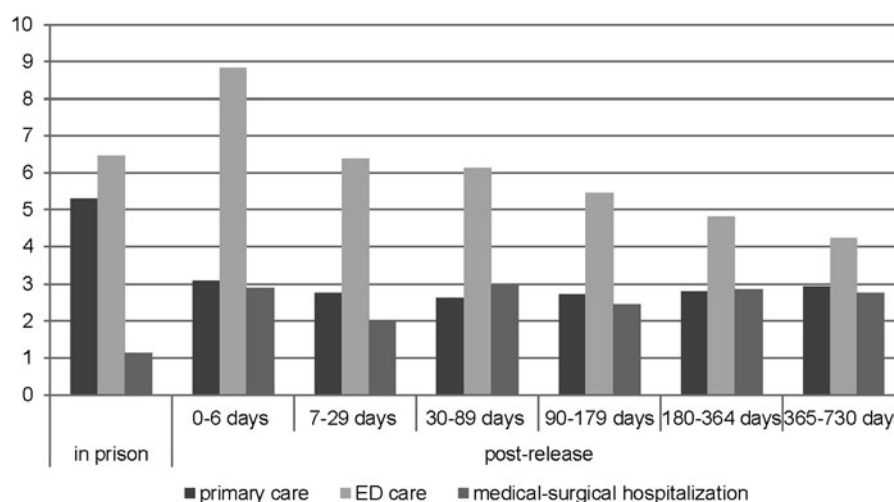
Unadjusted relative rate ratios for health care use by type of health care are provided in Supplementary Appendix S3 and shown in Figures 2 and 3 for the female incarceration group compared with the male incarceration group and with the female general population group, respectively; data on psychiatric hospitalization are not shown in Figure 3 since the relative rate ratio was so high for the female incarceration group in prison compared with the female general population group, at 198.9.

Discussion

This study shows that females who experience incarceration in Ontario had substantially worse health status compared with males who experience incarceration and age-matched females in the general population. They were more likely to have higher morbidity and to have specific psychiatric conditions than both comparator groups, and had several times higher risk of mortality postrelease compared with females in the general population. They used primary care more often than both comparator groups across all time periods, and they used emergency departments more often consistently compared with females in the general population and in most periods post-release compared with males who experience incarceration. They tended to have higher rates of medical-surgical and psychiatric hospitalization, although the difference was not consistently significant.

Our findings regarding relatively high rates of psychiatric conditions and specific medical conditions in females are consistent with prior research on females who experience incarceration from the United States, England, and Canada.^{1,6,9,10,21,26,27} Our findings regarding hospital admission contrast with recent population-level research from England that found age-matched people in the general population were more likely to be admitted to hospital²⁸; this between-study

FIG. 3. Unadjusted relative rate ratios of health care use for females released from provincial prison and females in the general population* in Ontario in 2010, by period relative to time in prison† and health care type. *The female general population group was matched by age to the female incarceration group. †For the incarceration leading to initial release in 2010, or for the corresponding period for the female general population group.



difference may be due to differences in population health status, health care in prison and in the community, and decision-making practices regarding hospital admission.^{29,30}

Through use of population-based data for a large sample of females who experience incarceration and relevant comparator groups, this study provides the first clear demonstration that females who experience incarceration have worse health across several important health status indicators than both males who experience incarceration and females in the general population. The relatively high rates of health care use we identified for females who experience incarceration may reflect their higher disease burden or could be a consequence of greater unmet health needs or different thresholds for seeking care.

High rates of morbidity, including psychiatric conditions in females who experience incarceration suggest the need for high-quality primary care as well as psychiatric care, both in prison and in the community. While this research identified a decrease in primary care utilization rates from the period in prison to the period after release, prior research reveals that a substantial proportion of people who experience incarceration in Ontario do not access primary care in the community in the years before and after incarceration,³¹ suggesting an unmet need for primary care in both time periods. Females may face substantial barriers to primary care in the community, such as competing priorities, lack of identification needed to access health care services, discrimination by health care staff, and poor coordination and continuity of health care between prison and the community.^{21,32–35} Supporting access to primary care through initiatives such as discharge planning and linkage with community-based primary care may address unmet needs and prevent acute health issues that may contribute to increased emergency department use and hospitalization while in prison and upon release.^{34,36–38}

Strengths of this study include our use of whole population data for people who were released from provincial prisons in 2010, which addresses the risks of selection bias inherent in most other data types. Further, in the context of a universal health insurance system, we were able to access all physician billings data, which allows us to comprehensively assess health care involving physicians. In addition, we used validated measures for specific diseases and for chronic disease burden through the Johns Hopkins Adjusted Clinical Groups System.^{22,23}

This study also has potential limitations. Males and females in the incarceration groups were not matched based on age, but as the age distribution between the two groups was similar, it is unlikely that age substantially contributed to the identified between-group differences in morbidity, mortality, and health care use. For certain outcomes that are less common, such as death and hospital admission, the study may have been underpowered to identify true differences between groups. We did not exclude admissions for pregnancy from medical-surgical admissions, which could contribute to the difference in admissions between females and males who experience incarceration and between females who experience incarceration and females in the general population. Research has shown that females are more likely to be diagnosed with mood and anxiety disorders than males, and males are more likely to be diagnosed with antisocial personality disorder and substance use disorders,³⁹ which may have led to a conservative bias, but is unlikely to account for the substantial differences in psychiatric condition preva-

lence and psychiatric hospitalization rates between males and females who experience incarceration. Also, the use of administrative data may underestimate the burden of illness and chronic disease prevalence, as outpatient physician billings support only one diagnosis as the reason for a visit, meaning that people with multiple comorbid conditions may be less likely to have any single diagnosis indicated in billings for a visit. Finally, the data on health care use describe rates but do not explain reasons for use or issues in care access and quality, which would vary in the community and in prison. For example, during incarceration there are barriers to accessing prison-based care and hospital-based health care such as the need to have someone arrange such care, and there are also administrative requirements that may lead to health care use, such as the requirement for routine assessment within weeks of prison admission. Additional research, including qualitative work such as interviews, would provide greater understanding of relevant issues that explain differences in health care use between groups.

Conclusion

Recognizing that females who experience imprisonment have worse health than males who experience imprisonment, and females in the general population has policy and programming implications for the criminal justice and health care systems. Priorities for change should be set by and with females who experience incarceration. In the context of the criminalization of mental illness and substance use, there may be opportunities to enhance access to evidence-based programs to divert females from prisons when appropriate, such as mental health and drug courts⁴⁰ as well as restorative justice programs,⁴¹ with potential benefits to population health and recidivism. Efforts should be made to address identified barriers to health care access in prison and in the community, and to tailor relevant health care services to be able to address multimorbidity and social complexity in patients, whether the point of health care access is primary care in prison, primary care in the community, the emergency department, or the hospital. Of note, as many females who experience incarceration have substantial trauma histories,⁴² health care and health promotion programs in prison and in the community should be trauma-informed. Future research should assess the impacts of program and policy changes on the health status of females.

Authors' Contributions

F.K. and E.N. contributed to the conception and design of the work. E.N. wrote the initial draft of the article. K.F. conducted analyses. E.N., M.K., B.O., and F.K. contributed to the interpretation of the data. All authors contributed to the revision of the article and approved the final version.

Acknowledgments

We acknowledge the Ministry of the Solicitor General for providing the correctional data. This study was supported through in kind contribution by ICES, which is funded by an annual grant from the Ontario Ministry of Health. Stephanie Cheng at ICES conducted some analyses. Parts of this material are based on data and/or information compiled and provided by CIHI.

Disclaimer

However, the analyses, conclusions, opinions, and statements expressed in the material are those of the authors, and not necessarily those of CIHI. The analyses, opinions, results, and conclusions reported in this article are also independent from the other sources that provided data and funding. No endorsement by ICES, the Ministry of the Solicitor General, or the Ministry of Health is intended or should be inferred.

Authors Disclosure Statement

No competing financial interests exist.

Funding Information

This study was funded by the Physicians' Services Incorporated Foundation (15–22) and the College of Family Physicians of Canada. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the article.

Supplementary Material

Supplementary Appendix S1
Supplementary Appendix S2
Supplementary Appendix S3

References

1. Binswanger IA, Merrill JO, Krueger PM, White MC, Booth RE, Elmora JG. Gender differences in chronic medical, psychiatric and substance-dependence disorders among jail inmates. *Am J Public Health* 2010;100:476–482.
2. Stürup-Toft S, O'Moore EJ, Plugge EH. Looking behind the bars: Emerging health issues for people in prison. *Br Med Bull* 2018;125:15–23.
3. Kouyoumdjian FG, Cheng SY, Fung K, et al. Primary care utilization in people who experience imprisonment in Ontario, Canada: A retrospective cohort study. *BMC Health Serv Res* 2018;18:845.
4. Kouyoumdjian F, Kim M, Kiran T, et al. Attachment to primary care and team-based primary care Retrospective cohort study of people who experienced imprisonment in Ontario. *Can Fam Physician* 2019;65:433–442.
5. Tuinema J, Orkin AM, Cheng SY, Fung K, Kouyoumdjian FG. Emergency department use in people who experience imprisonment in Ontario, Canada. *CJEM* 2020;22:232–240.
6. Janssen PA, Korchinski M, Desmarais SL, et al. Factors that support successful transition to the community among women leaving prison in British Columbia: A prospective cohort study using participatory action research. *CMAJ Open* 2017;5:717–723.
7. Kinner SA. The case for improving the health of ex-prisoners. *Am J Public Health* 2014;104:1352–1355.
8. McCann LJ, Peden J, Phipps E, et al. Developing gender-specific evidence-based standards to improve the health and wellbeing of women in prison in England: A literature review and modified eDelphi survey. *Int J Prison Health* 2019;16:17–28.
9. Tyler N, Miles HL, Karadag B, et al. An updated picture of the mental health needs of male and female prisoners in the UK: Prevalence, comorbidity, and gender differences. *Soc Psychiatry Psychiatr Epidemiol* 2019;54:1143–1152.
10. Teplin LA, Abram KM, McClelland GM. Prevalence of psychiatric disorders among incarcerated women. I. Pre-trial jail detainees. *Arch Gen Psychiatry* 1996;53:505–512.
11. Staton-Tindall M, Duvall JL, Leukefeld C, et al. Health, mental health, substance use, and service utilization among rural and urban incarcerated women. *Womens Health Issues* 2007;17:183–192.
12. Statistics Canada. Adult correctional statistics in Canada, 2010/2011, 2012.
13. Government of Ontario. Get coverage for prescription drugs 2016 [updated January 17, 2019. Available at: <https://www.ontario.ca/page/get-coverage-prescription-drugs> Accessed January 21 2019.
14. Kouyoumdjian FG, Cheng SY, Fung K, et al. The health care utilization of people in prison and after prison release: A population-based cohort study in Ontario, Canada. *PLoS One* 2018;13:e0201592.
15. Hux JE, Ivis F, Flintoft V, et al. Diabetes in Ontario: Determination of prevalence and incidence using a validated administrative data algorithm. *Diabetes Care* 2002;25:512–516.
16. Tu K, Campbell NR, Chen Z-L, et al. Accuracy of administrative databases in identifying patients with hypertension. *Open Med* 2007;1:e18–e26.
17. Gershon AS, Wang C, Guan J, et al. Identifying patients with physician-diagnosed asthma in health administrative databases. *Can Respir J* 2009;16:183–188.
18. Gershon AS, Wang C, Guan J, et al. Identifying individuals with physician diagnosed COPD in health administrative databases. *COPD* 2009;6:388–394.
19. Antoniou T, Zagorski B, Loutfy MR, et al. Validation of case-finding algorithms derived from administrative data for identifying adults living with human immunodeficiency virus infection. *PLoS One* 2011;6:e21748.
20. Mental Health and Addictions Scorecard and Evaluation Framework Research Team. Mental health and addictions system performance in Ontario. A baseline scorecard. Technical appendix 2018. Toronto OI.
21. Ahmed R, Angel C, Martel R, et al. Access to healthcare services during incarceration among female inmates. *Int J Prison Health* 2016;12:204–215.
22. The Johns Hopkins ACG System [website]. Baltimore. Available at: <https://www.hopkinsacg.org/> Accessed March 19, 2021.
23. Austin PC, van Walraven C, Wodchis WP, et al. Using the Johns Hopkins Aggregated Diagnosis Groups (ADGs) to predict mortality in a general adult population cohort in Ontario, Canada. *Med Care* 2011;49:932–939.
24. Cohen J. Statistical power analysis for the behavioral sciences, 2nd ed. Hillsdale, NJ.: Lawrence Erlbaum Associates, Publishers, 1988.
25. Austin P. Using the standardized difference to compare the prevalence of a binary variable between two groups in observational research. *Commun Stat Simul Comput* 2009;38:1228–1234.
26. Roland M Jones, Kiran Patel, Alexandar IF Simpson. Assessment of need for inpatient treatment for mental disorder among female prisoners: A cross-sectional study of provincially detained women in Ontario. *BMC Psychiatry* 2019;19:98.
27. Bartlett A, Hollins S. Challenges and mental health needs of women in prison. *Br J Psychiatry* 2018;212:134–136.

28. Davies M, Rolewicz L, Schlepper L, Fagunwa F. Locked out? Prisoners' user of hospital care. Nuffield Trust, 2020. Available at: <https://www.nuffieldtrust.org.uk/research/locked-out-prisoners-use-of-hospital-care> Accessed March 19, 2021.
29. Kouyoumdjian FG, Lee JY, Orkin AM, et al. Thirty-day readmission after medical-surgical hospitalization for people who experience imprisonment in Ontario, Canada: A retrospective cohort study. *PLoS One* 2020;15: e0227588.
30. Edge C, Stockley MR, Swabey ML, et al. Secondary care clinicians and staff have a key role in delivering equivalence of care for prisoners: A qualitative study of prisoners' experiences. *EClinicalMedicine* 2020;24: 100416.
31. Kouyoumdjian F, Kim M, Kiran T, et al. Attachment to primary care and team-based primary care: Retrospective cohort study of people who experienced imprisonment in Ontario. *Can Fam Physician* 2019;65:e433–e442.
32. Ahmed RA, Angel C, Martell R, et al. The impact of homelessness and incarceration on women's health. *J Correct Health Care* 2016;22:62–74.
33. Smith SA, Mays GP, Collins TC, et al. The role of the community health delivery system in the health and well-being of justice-involved women: A narrative review. *Health Justice* 2019;7:12.
34. Hu C, Jurgutis J, Edwards D, et al. "When you first walk out the gates...where do [you] go?": Barriers and opportunities to achieving continuity of health care at the time of release from a provincial jail in Ontario. *PLoS One* 2020; 15:e0231211–e11.
35. Fahmy N, Kouyoumdjian FG, Berkowitz J, et al. Access to primary care for persons recently released from prison. *Ann Fam Med* 2018;16:549–551.
36. Kouyoumdjian FG, Orkin AM. Improving health and healthcare access for people who experience imprisonment in Ontario. *Healthc Q* 2020;23:6–9.
37. Wang EA, Hong CS, Shavit S, et al. Engaging individuals recently released from prison into primary care: A randomized trial. *Am J Public Health* 2012;102:e22–e29.
38. Wang EA, White MC, Jamison R, et al. Discharge planning and continuity of health care: Findings from the San Francisco County Jail. *Am J Public Health* 2008;98:2182–2184.
39. Eaton NR, Keyes KM, Krueger RF, et al. An invariant dimensional liability model of gender differences in mental disorder prevalence: Evidence from a national sample. *J Abnorm Psychol* 2012;121:282–288.
40. Human Services & Justice Coordinating Committee PHSaJ CCatCMHA, Ontario Division. *Mental Health Courts in Ontario*, 2017.
41. Stewart L, Thompson J, Beaudette JN, et al. The impact of participation in victim-offender mediation sessions on recidivism of serious offenders. *Int J Offender Ther Comp Criminol* 2018;62:3910–3927.
42. Bodkin C, Pivnick L, Bondy SJ, et al. History of childhood abuse in populations incarcerated in Canada: A systematic review and meta-analysis. *Am J Public Health* 2019;109:e1–e11.

Address correspondence to:

Fiona G. Kouyoumdjian, MD, PhD

Department of Family Medicine

McMaster University

David Braley Health Sciences Building, 5th Floor

100 Main Street West

Hamilton L8P 1E6

Canada

E-mail: kouyouf@mcmaster.ca