




Implicit Bias and Health Disparities in the Incarcerated Population: A Review With a Focus on Neurological Care and the Canadian Perspective

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Abstract

Implicit bias held by health care providers can adversely affect the care provided to vulnerable populations and contribute to existing healthcare inequities. Few reports exist on the health of incarcerated individuals. We herein aimed to report how implicit bias affects the care of incarcerated and detained individuals, especially for those experiencing neurological diseases. We frame our review by providing an overview of the organization of the Canadian correctional system and of its population. We highlight the flagrant overrepresentation of Indigenous people and racialized groups in Canadian prisons, which is germane to the healthcare in this population, particularly when viewed through the lens of intersectionality. We also discuss health disparities between incarcerated individuals and the general population, whether it be in terms of neurological, psychiatric, or infectious diseases. Factors other than implicit bias found to affect medical care for these individuals include the perception of safety issues for both healthcare providers and patients in hospital and clinic settings, as well as resource limitations, confounding psychiatric comorbidities and non-organic disorders, and systemic barriers to adequate follow-up in this population. Using illustrative cases from our institution's experience, paired with findings from our review of the literature,

we demonstrate that incarcerated or detained individuals represent a vulnerable group disadvantaged through a series of inequitable policies and actions, which put this group at higher risk of poor general and neurological health. Data specific to neurological diseases in this population are lacking, especially pertaining to long-term healthcare experiences and outcomes. In addition to highlighting literature gaps in this population, we propose ways in which barriers to care can be addressed, such as the development of multidisciplinary care teams to facilitate care and follow-up in these populations. Healthcare providers should make use of opportunities presented to diagnose and treat diseases in this population. Follow-up by specializing nursing and physician teams, as well as care during incarceration by medical and rehabilitation team members including occupational and physiotherapists may help build bridges between healthcare and carceral institutions. Education to raise awareness of implicit bias and mitigation strategies amongst health care providers is another way in which care provided to incarcerated individuals can be improved.

Keywords: Health equity; Neurology; Neurosurgery; First Nations; Prisoners; Underserved populations

Introduction

Implicit bias held by health care providers adversely affects the quality of care provided to underrepresented minorities [1-5], as it alters our perceptions, thereby disrupting interactions with patients and decision-making [4, 6]. Recognizing and aiming to mitigate implicit bias is an essential strategy for addressing healthcare inequities [6, 7]. While there exist a multitude of reports on implicit and explicit bias due to race [2, 3, 8-10], obese individuals [11], elderly individuals [12, 13], and women [14, 15], fewer reports focus on how implicit bias affects the care of incarcerated and detained individuals, especially for those experiencing neurological diseases. There is also very little data on the health of incarcerated individuals in Canada in particular. In an effort to educate about implicit bias and health equity, our Clinical Neurosciences Department launched "Health Equity Rounds (HERs)" based on the model proposed by Perdomo et al [16]. This article is derived from the work and discussion from our first rounds, in which we aimed to review implicit bias directed against incarcerated and

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detained individuals and to provide a perspective on how neurological care is affected by implicit bias directed toward them. We herein provide our institution's model for our departmental HERs, and further provide historical context for incarceration in Canada and describe how both historical teaching in Canada and media can affect our perception of incarcerated individuals. We will review the health of incarcerated populations, which merits special attention, as carceral institutions have been shown to put individuals at higher health risks for chronic health conditions compared to the general population [17].

Methods

This narrative review was written based on the inaugural presentation of HERs in the Department of Clinical Neurosciences (DCNS) at the University of Calgary, on February 12, 2021. The format of the rounds was based on the model of Perdomo and colleagues [16]. The DCNS includes clinicians, clinician-scientists, academics, and fundamental researchers across diverse, interrelated disciplines (neurology, physical medicine and rehabilitation, neurosurgery, and translational neuroscience). Trainees include residents, clinical fellows, graduate students, and post-doctoral researchers. Allied health members from the department also take part in these rounds.

The presentation was prepared and delivered by two of the authors (CV and AG) with consultation from the other listed authors and the HER committee (see Acknowledgements). The HER committee was asked to provide illustrative cases to demonstrate themes relevant to health equity. We synthesized knowledge for this presentation and eventual narrative review using sources identified by searching MEDLINE-listed publications. Supporting information was obtained by reviewing bibliographies of relevant articles, additional internet-based searches, and from personal bibliographies of the authors. We informally and anonymously captured additional points that were brought up during the discussion period of the presentation.

Narrative Review

The Canadian correctional system

As both our case vignettes (presented later in this article) involve patients incarcerated in the Canadian correctional system, understanding the context of this system is foundational. The Canadian correctional system relies on both federal and provincial or territorial governments for its administration. Individuals over 18 years old sentenced to greater than 2 years of prison fall under the federal administration, named the Correctional Service of Canada. Adult offenders in the community under paroled release are also under the federal administration. Healthcare is provided by the Canadian correctional system in federal prisons. Provincial and territorial service programs oversee adults serving sentences that are less than 2 years, individuals held in remand or awaiting their sentence, and those under probation serving community sentences. These regional programs are also responsible for youth correctional services

[18]. Healthcare in provincial prisons can be provided through the governmental authority responsible for health in the rest of the province, the correctional authority, or a contract with a private company. This inconsistent "ownership" of prison healthcare is similar to that of the USA, where healthcare can vary widely depending on policies, budget, and staff across the federal, state, and local jurisdictions [19]. In contrast, Finland, France, and the UK have opted for prison healthcare to be governed by the ministry of health, while other countries such as Spain and Denmark share this responsibility between the ministry of health and another ministry, typically the ministry of justice [20].

Whom do we incarcerate in Canada?

The Canadian incarceration rate was 127 per 100,000 people in 2017 - 2018 [21]. The provinces with the highest incarceration rates include Alberta, Manitoba, and Saskatchewan, with 108, 201 and 215 per 100,000, respectively. The three territories, Yukon, Northwest Territories, and Nunavut have the highest incarceration rates in the country, with 206, 534 and 667 per 100,000, respectively.

When treating incarcerated patients, physicians should be reminded that while incarceration carries with it a perception of criminality, miscarriages of justice and inequitable policing practices of various populations are common. Indeed, historically, incarceration has been influenced by political and socio-cultural forces beyond the principles of criminal justice. During World War I, Canada detained German-origin citizens in internment camps on behalf of the British Empire purely because of their original nationality [22]. During World War II, Canadians of Japanese origin were subject to internment based on their ethnicity, as were some Canadians of Italian origin [22]. The War Measures Act allowed authorities to subject any Canadians of Japanese descent, including women and children, to an internment camp. Their assets could also be seized, and some would be repatriated to Japan. Non-Japanese women held during World War II, were detained at the women's prison in Kingston, Ontario [22]. More recently, Tamil refugees from the Sri Lankan Civil War were interned after seeking asylum in Canada. At the time, the media claimed that these refugees were part of terrorist groups, making internment more acceptable to the eye of Canadians [23]. The media used terms such as "illegal migrants" or "human traffickers" to describe them [23-25]. Having been painted as "illegals migrants", many were detained in old buildings or prisons, separated from family members and detained for months and often denied the legal rights of asylum seekers [23-26]. When looking more closely at racial distribution in the currently incarcerated Canadian population, there is a flagrant overrepresentation of Indigenous people [27], who have historically been overpoliced and controlled through policy and legislation that made even social participation illegal. Indigenous men are incarcerated at a rate eight times greater than white men [28]. Over 40% of incarcerated women in Canada were of Indigenous ancestry in 2018 [27, 29, 30]. In 2020, the Correctional Investigator of Canada stated that there was "Indigenization" of the Canadian correctional system. In-

deed, while Canada's crime rates are hitting all-time lows, the incarceration rates for Indigenous individuals continue to climb significantly. These data suggest that incarceration today remains a well-disguised and societally accepted system of racial control and dissimulated assimilation [31, 32].

While the overrepresentation of certain races is an issue in Canada's prison system, it is also an issue in other countries, including in the USA and Australia [33, 34]. Similar to Canada, there is Indigenization of the carceral system in Australia, where the Indigenous Aboriginal and Torres Strait Islanders represent 27% of the incarcerated population while they compose 2% of the general population. It has been widely demonstrated that the risk of imprisonment for non-White individuals is increased compared to their White counterparts, including for the same crime [35-37], and can be as high as 57% in Black men who do not have high school education. Nearly half of Black women had a family or extended family member imprisoned, compared to only 12% of white women [38]. Although there is likely also an overrepresentation of certain races in European prisons, the literature and research on this topic remain limited [39].

The overrepresentation of certain races in the incarcerated population is germane to the healthcare of this population, particularly when viewed through the lens of intersectionality. Intersectionality is defined as the interconnection between social categorization, including race, gender, nationality, disability, socioeconomic class, and sexuality [40-42]. This concept recognizes that independent yet overlapping systems have a compounding effect in creating and leading to disadvantage or discrimination. This concept aims to recognize many things can marginalize one individual [40-42]. In other words, health inequity experienced by an incarcerated patient can be compounded by other aspects of their identity that are also vulnerable to healthcare discrimination such as race, obesity, older age, and female sex [2, 3, 8-13]. Indeed, if Indigenous people are more likely to be incarcerated, they are also more likely to be mistreated in these institutions, although data regarding disparities within the incarcerated population are lacking. Further, they are more likely to be placed in maximum security institutions, are overrepresented in the use of force, and are more likely to be placed and held in solitary confinement units [29]. They also serve longer sentences before being granted parole compared to their white counterparts, which is not surprising as time in solitary confinement or incidents with guards make them less likely to get parole thereafter. While incarceration is widely racialized in North America, it is worth noting that homeless or unemployed individuals were also disproportionately not granted bail and incarcerated on remand [43]. Homelessness and unemployment disproportionately affect racialized groups, including Indigenous people [44]. As an example, during the coronavirus disease 2019 (COVID-19) pandemic, unemployment rates were twice as high amongst Indigenous people compared to non-Indigenous people [45]. Additionally, inmates are paid only a few dollars per day to provide services, such as making furniture that is then sold to the Canadian public [46]. While incarcerated individuals are stripped of their most basic human rights, they also form a highly vulnerable population in terms of their health status. In fact, incarcerated individuals

are disproportionately more vulnerable in terms of their determinants of health [20]. Indeed, incarcerated individuals tend to have a lower income and social status prior to incarceration and are more less likely to have secure employment and working conditions. Race, childhood experiences, social supports, as well access to healthcare are also factors that make incarcerated individuals' health more at risk. Furthermore, discrimination, racism and historical trauma are factors that play into social determinants of health, all of which disproportionately affect certain groups, some of which are overrepresented in prisons [47]. Acknowledging these realities is a first step towards fully "seeing" the incarcerated patients, like the ones presented in our case vignettes.

The health status of the incarcerated

There is a significant health disparity between prisoners and the general population (Table 1) [19, 48-61]. Indeed, prisoners are at increased risk for intravenous drug use or alcohol consumption which in turn increases the risk of infectious diseases, cardiovascular diseases, and cancer [48]. In addition, there is a higher burden of psychiatric and chronic illness amongst the incarcerated population, with suicide being the leading cause of death during custody. Mortality is also very high in their first week after release from prison: men were 29 times more likely to die from all causes in the first week after their release, while women were 69 times more likely [48]. Following release, the most common causes of death were homicide, suicide, and drug overdose [62, 63]. Hence, it is quite clear that inmates are more vulnerable from a healthcare perspective and that access to care remains a barrier to improving health for these individuals, in addition to lack of intervention or attention for specific conditions. Possible explanations for this disparity between incarcerated individuals and the general population include confinement itself, which may increase the risk of infectious disease, as well as poor sanitary condition. It should be noted however that incarcerated populations have higher rates of infectious diseases even prior to incarceration, in part due to lower socioeconomic status, poor access to healthcare and participation in high-risk behaviors [17, 64]. The lack of social support, loss of freedom, interpersonal conflicts which may arise in prison are also stressors that can affect one's mental health and explain the higher rates of psychiatric conditions and chronic diseases exacerbated by stress in this population [17, 64].

In specific reference to neurological disorders, contrary to previous beliefs, there is no difference in the prevalence of epilepsy between the incarcerated population and the general population [65]. However, there is a very high prevalence of traumatic brain injury (TBI) and fetal alcohol spectrum disorder (FAS) in the incarcerated population [66-71]. In fact, two studies found that up to 50% of male inmates had evidence of TBI at some point in life [66, 67]. Previous reports suggest that a small proportion of the incarcerated population is diagnosed with cognitive disorder. In reality, this proportion is likely higher, in part due to the aging inmate population, and because of the lack of screening for cognitive disorders in prison [72, 73]. Cognitive impairment is further associated with adverse

Table 1. General Health Status of the Incarcerated Population

Health status	
Psychiatric diseases	Near 1/7 prisoners have a treatable mental illness [48, 49]. Proportion of individuals with psychiatric disorder is higher amongst incarcerated population compared to the general population [48]. 1/3 of prisoners with a diagnosis of schizophrenia or bipolar disorder were not pharmacologically treated while in prison [50]. Suicide is the leading cause of death in custody [48, 51].
Infectious diseases	Higher rates of HIV compared to the general population [52, 53]. Higher risk of viral hepatitis [52, 54, 55]. High rates of tuberculosis [56, 57]. Higher rates of COVID-19 infection prior to vaccine distribution, with the inability to safely self-isolate [58-60].
Chronic illness	Higher prevalence of hypertension, asthma, arthritis, diabetes [48].
Oncological diagnoses	One-third of illness-related death in US state prisons is due to oncologic illness [19, 61].

HIV: human immunodeficiency virus; COVID-19: coronavirus disease 2019.

health and judicial outcomes, perhaps partly due to inequitable policing of people with cognitive decline or due to the lack of recognition of cognitive decline by the judicial system [74]. Other neurological conditions can increase the risk of incarceration, such as brain tumors, or encephalitides, which may be associated with behavioral symptoms of impulsivity, disinhibition, and emotional lability [75-77]. Thus, accurate diagnosis and careful management of neurological disorders is a key component of caring for incarcerated individuals.

Perspective on the neurological health of the incarcerated population

Incarceration has been considered an opportunity to address healthcare access gaps and to allow bridging between this population with a high disease burden and our healthcare system [20, 78]. However, there are many barriers to the best delivery of care, both in prison and in community settings. We have previously addressed that the basic provision of healthcare in Canada detention facilities is variable based on how it is managed and delivered, whether it is the responsibility of the government or a private entity. However, even when individuals do access care, especially in acute and community care facilities, several other barriers may limit the care provided to these individuals, which will be discussed in context of the case discussions below.

Table 2. Case Vignettes

Case 1	Case 2
A 46-year-old male is brought into the emergency department with a new-onset focal to bilateral generalized tonic-clonic seizure. Neurology is consulted and over the phone, the consultant is told the patient is a violent offender. Over the next 24 - 48 h, investigations are performed and both electroencephalography and magnetic resonance imaging (MRI) of the brain are negative. The patient is started on levetiracetam (a reasonable choice) at the typical target dose but is discharged without any further follow-up.	A 34-year-old man is brought in by prison guards after an altercation reporting some left leg weakness. Neurology is consulted for further workup and management. All investigations, including MRI of the brain and full spine come back negative and physical examination indicates functional overlay with a component of anxiety. The patient is discharged without follow-up with reassurances that he will get better.

Illustrative Cases and Discussion

Here, we share two case vignettes submitted by members of our HERs committee to help readers start their reflection on their own experience with implicit bias towards incarcerated individuals (Table 2).

Our literature review and discussion from attendees at the HER presentation identified several issues that impact medical care for incarcerated individuals, which we have summarized in Table 3.

Discussion points from both cases mentioned the safety concern for physicians when seeing this patient population in the acute setting or follow-up in a clinic setting. Given the recent tragic murder of an Alberta family physician by a patient of the clinic [79], our group discussed ways the workplace could be made safer, including having a third party in the room for increased provider and patient safety, having patients leave their personal items outside the examination rooms, and having distress alarms in clinic rooms. It was felt that safety concerns could represent a barrier to undertaking incarcerated individuals as patients. Individuals from our group also mentioned follow-up was at times limited in this population, given the number of resources required for incarcerated individuals to leave their institution. Most neurological diseases require some level of follow-up for improved outcomes, and this is particularly the case for challenging conditions like epilepsy

Table 3. Factors Affecting Medical Care for Incarcerated Persons

Factors	Explanation
Biases from health care providers	Health care providers may misattribute symptoms to non-organic disorders or substance use disorders given higher prevalence of psychiatric and substance use among incarcerated persons. Additive impact of systemic and interpersonal racism may contribute to variable health outcomes and is important given that most of the incarcerated population in Canada is non-White Lack of education on cultural safety and humility during medical training which perpetrates these biases.
Safety for health care providers and patients	Perception by physicians that following up with patients may not be safe, particularly applicable to community-based clinics that are less likely to have access to security personnel. Patients, particularly Indigenous people, may have had negative experiences with the health care system (lack of cultural safety and humility) and may also have experienced true safety concerns due to previous traumatic experiences. General belief held by healthcare providers that prisoners can be incarcerated for violent crimes and stereotypes held that Indigenous and Black individuals tend to demonstrate unprovoked violence may lead them to believe they are at risk for violence while providing care for incarnated patients.
Resource limitations	High resource requirements and logistical challenges to bring people from facilities to appointments and back, with appropriate supervision/security.
Communication	Reduced ability for to communicate changes in health status (medication side effects or worsening condition) to health providers. However, continuous surveillance in incarceration can sometimes be advantageous in identifying changes in health status.
Neurologic or psychiatric comorbidities	Individuals have higher prevalence of traumatic brain injuries and mental health disorders which impact medical care.
Non-organic disorders	Malingering and other non-organic presentations may be more prevalent and are associated with the above-mentioned mental health disorders.
Incomplete examinations	Restraints requirement may limit portions of the neurological examination and make reaching the correct diagnosis more challenging.

and functional neurological disorders, as in our case vignettes. It was felt that follow-up remained a challenge both when individuals were incarcerated and upon release [80]. This appears to be a problem that has been reported in the literature although research including this population is lacking [80].

A major theme with both cases was regarding clinical follow-up. Here safety (as discussed above) was a factor, but also concerns about the logistical challenges in organizing subsequent care [81]. Overall, mechanisms do exist to provide follow-up appointments, and factors within the carceral system (surveillance, medication compliance, trained personnel) make it possible to provide such care to patients' benefit [81]. Follow-up care can be complex for chronic neurologic disorders and can be an even greater challenge for neurosurgical conditions. There was a concern for poor surgical outcomes or a complicated postoperative course in this population. Neurosurgical outcome data with a focus on this population are lacking. There is evidence that individuals who are incarcerated have a similar burden of emergency general surgical needs, but that they tend to present with high rates of complications on presentation and low rates of surgical intervention [82]. There exist multiple reasons for this, including a delay in presentation, or presentation with such severe disease that surgical management has become futile. There is also a concern that these patients may not have the best surgical outcome because of poor adherence to follow-up or postoperative care.

However, some surgeons at our center reported positive experiences with the incarcerated population, with a satisfactory postoperative course and outcomes. A possible explanation for this was the adherence of carceral institutions to follow-up appointments as recommended by the neurosurgeons. Special considerations for this population should still be given in certain circumstances, including after hemicraniectomy. Indeed, hemicraniectomy is a procedure where the bone is removed from over the brain typically for a 3-month period. During this time, a large portion of the brain is no longer protected by bone. In patients where the risk of brain injury is higher, such as incarcerated individuals who are at higher risk of experiencing violence, cranioplasty should at times be considered earlier given the higher risk of brain injury. Indeed, while cranioplasty done earlier in the course may be associated with higher risk of infection [83], the risk of injury to the brain no longer protected by bone may be more significant in this population. More research is needed to understand better the neurosurgical needs of this population and their outcomes.

When researching this topic, it was clear that evidence is lacking to understand the burden of neurological disease among incarcerated populations. There is historically limited participation of incarcerated persons in research, with recent calls to engage them more in health research and advocacy [84]. There is some evidence indicating that certain neurological conditions have prevalences similar to what is seen in the

general community [85, 86]. However, some neurological conditions have a high burden in the incarcerated population, one of them being traumatic brain injury [70, 71]. While there is an association between traumatic brain injuries and the risk of incarceration in one individual, it is unclear how the two variables interact, and the interaction is likely complex and bidirectional. Incarceration remains an opportunity to address traumatic brain injury and its consequences. Indeed, screening for traumatic brain injury and offering multidisciplinary care with the help of occupational therapists, and specialized nursing teams, has been shown to decrease recidivism and favor reintegration [87]. In addition, given this association, we hypothesize that primary and secondary preventive measures for traumatic brain injuries may be beneficial, especially in areas with lower socioeconomic status. This should be done in conjunction with multidisciplinary teams at acute care facilities to establish relationships between these high-risk populations and healthcare workers.

Lastly, it has become clear that the incarcerated population represents a group made vulnerable through a series of inequitable policies and actions, which is highly racialized, and is at higher risk of poor general and neurological health. Although data specific to neurological diseases are lacking, there continue to be gaps that can be addressed at a local and regional level to improve the care provided to these individuals. More research about surgical outcomes in these individuals is warranted, and more data on follow-up during incarceration and after release are needed. Indeed, we were able to see in our two case vignettes that lack of follow-up could lead to an increased risk of complications from the diagnosed neurological diseases. Barriers to follow-up include absence of bridge between healthcare institutions and carceral institutions, lack of guaranteed safety for both physicians and patients, especially in an outpatient setting, and the potential loss to follow-up with release. As previously discussed, there are several ways in which these barriers can be addressed. We additionally proposed the development of multidisciplinary teams including specialized nurses, occupational therapists, social workers and pharmacists to facilitate the bridge between incarcerated institutions and healthcare institutions. Our institutional experience showed that positive outcomes could be achieved in incarcerated patients with adequate follow-up. This suggests that follow-up is an important variable in improving neurological and general health in this population. In addition, while evidence is still lacking, we hypothesize implicit bias awareness and mitigation is likely tied to patient outcome, and we suggest developing frameworks to discuss health equity within departments to address disparities in the care provided to different populations of patients.

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Conflict of Interest

The authors have no conflict of interest to declare.

Author Contributions

Catherine Veilleux (MD MSc) drafted original manuscript, conducted literature review, and responsible for editing process. Pamela Roach (PhD) provided substantial critical review of important intellectual content. Lara J. Cooke (MD MSc FRCPC) provided substantial critical review of important intellectual content. Gerald Pfeffer (MD PhD FRCPC) provided substantial critical review of important intellectual content, designed the tables, and contributed to the original idea. Nicole A. Johnson (MD FRCPC) provided substantial critical review of important intellectual content. Aravind Ganesh (MD FRCPC) provided substantial critical review of important intellectual content, contributed to the original idea and provided supervision.

Data Availability

Any inquiries regarding supporting data availability of this study should be directed to the corresponding author.

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