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Scoping review of current challenges and circumstances impacting Indigenous applications to Canadian medical schools
Examen de la portée des défis actuels et des circonstances ayant un impact sur les candidatures des Autochtones dans les facultés de médecine canadiennes

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Results: Despite formal commitments to reduce barriers, Indigenous applicants to medical school in Canada still face barriers that non-Indigenous applicants do not. Most programs use tools for admission known to disadvantage Indigenous applicants. Indigenous applicants do not have equitable access to medical school seats. Facilitated Indigenous stream processes first ensure Indigenous applicants meet all minimum requirements of Canadian students, and then require further work.

Discussion: Seven years after the Truth and Reconciliation Commission called on Canadian universities and governments to train more Indigenous health care providers, there has been limited progress to reduce the structural disadvantages Indigenous students face when applying to medical school. Based on best practices observed in Canada and coupled with relevant Indigenous-focused literature, recommendations are made for multiple stakeholders.

Conclusions: The study was limited by the data available on numbers of Indigenous applicants and matriculants. Where available, data are not encouraging as to equitable access to medical school for Indigenous populations in Canada. These findings were presented at the International Congress of Academic Medicine 2023 Conference, April 2023, Quebec City, Canada.

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Reviews, Theoretical Papers, and Meta-Analyses

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Abstract

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Résumé

Introduction : Compte tenu des recommandations pertinentes de la Commission de vérité et réconciliation de 2015, cet article examine l'état actuel des processus d'admission des Autochtones dans les facultés de médecine canadiennes et explore les obstacles persistants auxquels sont confrontés les candidats autochtones.

Méthodes : Un résumé de la littérature illustrant les désavantages des outils d'admission actuels pour les candidats autochtones est présenté. Une recherche de la littérature grise a été effectuée sur les exigences d'admission actuelles, les processus d'entrevue et d'autres données pertinentes de chaque faculté de médecine. Des tableaux comparant les différences entre leurs approches sont inclus. Un calcul de l'accès des Autochtones aux places dans les facultés de médecine par rapport à l'ensemble de la population canadienne a été effectué. Les lacunes dans l'exécution sont explorées, aboutissant à un tableau de recommandations.

Résultats : Malgré les engagements officiels visant à réduire les obstacles, les candidats autochtones qui appliquent aux facultés de médecine canadiennes se heurtent encore à des obstacles auxquels les candidats non autochtones ne sont pas confrontés. La plupart des programmes utilisent des outils d'admission connus pour désavantager les candidats autochtones. Les candidats autochtones n'ont pas un accès équitable aux places dans les facultés de médecine. Des processus d'accès facilités pour les autochtones permettent d'abord de s'assurer que les candidats autochtones satisfont à toutes les exigences minimales des étudiants canadiens, puis nécessitent d'autres travaux.

Discussion : Sept ans après que la Commission de vérité et réconciliation ait demandé aux universités et aux gouvernements canadiens de former davantage de prestataires de soins en santé autochtone, les progrès réalisés pour réduire les désavantages structurels auxquels les étudiants autochtones sont confrontés lorsqu'ils posent leur candidature à une faculté de médecine sont limités. Sur la base des meilleures pratiques observées au Canada et de la littérature autochtone pertinente, des recommandations sont formulées à l'intention de multiples parties prenantes.

Conclusions : L'étude est limitée par les données disponibles sur le nombre de candidats et d'étudiants autochtones. Lorsqu'elles sont disponibles, les données ne sont pas encourageantes en ce qui concerne l'accès équitable aux études de médecine pour les populations autochtones au Canada. Ces conclusions ont été présentées lors de l'édition 2023 du Congrès international de médecine universitaire (CIMU) qui s'est déroulé en avril 2023 dans la ville de Québec, au Canada.

Introduction

Colonial policies have had a devastating impact on Indigenous peoples in Canada. The continued promotion of colonialist beliefs through anti-Indigenous racism in health care has been in the spotlight recently; the stories of Brian Sinclair[1] and Joyce Echaquan[2] are high-profile examples of the discriminatory attitudes and practices Indigenous peoples may encounter if they seek care in the settler health system. An Indigenous patient presenting to a tertiary care setting may encounter health care providers who assume an Indigenous person is an addict or alcoholic, or that they are pretending to be sick to abuse medicine.[3,4] Stereotypical assumptions by health care providers continue to send messages that Indigenous ways of knowing are primitive, and not to be valued or permitted in the existing health care system. Indigenous ceremony and healing practices are not widely accepted, and patients may even be forced to perform cultural customs including smudging outside.[5] The presence of anti-Indigenous racism and lack of cultural awareness demonstrated by health care providers can impact the use of health care services by Indigenous people.

Past literature has illustrated that patients respond better to those health care providers with whom they share a cultural connection.[6] One strategy to achieve these goals is to increase the number of Indigenous health professionals, particularly in medicine. Virtually all students accepted to medical schools in Canada will go on to become licensed physicians,[7] meaning that Canadian medical schools have a huge part to play in determining the future of Canada's physician workforce. They therefore have a duty to prioritize the training of Indigenous and other minority group members to correct current underrepresentation in health care program admissions and subsequent training opportunities. All 17 Canadian medical schools have developed programs designed to increase admission of Indigenous students.

Medical school admission in Canada is extremely competitive[7] and structural disadvantages related to generations of systemic colonial oppression have made it difficult for Indigenous students to present competitive applications with the admissions tools currently in use.[8] In recognition of this, the Indigenous Physicians Association of Canada and the Association of Faculties of Medicine of Canada (AFMC) created the Joint Commitment to Action on Indigenous Health (JCAIH) in 2019.[8] Endorsed by 17 Deans of Medicine, this report served as a roadmap for Canadian Schools of Medicine to fulfill their social accountability mandates for Indigenous Health. Prepared by an Indigenous Working Group on behalf of the AFMC, this report included 10 recommendations, with recommendation eight addressing the student admissions processes to increase the recruitment and retention of Indigenous medical students.[9]

The JCIAH report (2019) encouraged Canadian medical schools to consider broader strategies that will help identify the qualifications of Indigenous students, which previously had not been adequately assessed by Canadian Medical Schools with current mechanisms:

> *Medical schools will work towards admitting a school specific minimum number of First Nations, Métis and Inuit students each year by employing distinctions-based approaches and practicing holistic file reviews. Robust data collection with appropriate data stewardship agreements will allow for review of progress towards goals at the individual school, provincial and national level.*[8]

They agreed to collect data to assist with monitoring progress, but detailed data is often not made publicly available.[10]

Recognising that medical schools are taking action to mitigate the product of their own application systems, it is important to examine the root causes of why more Indigenous students do not apply, and how the applications of those who do are evaluated. It is important to examine barriers for admission to medical school of Indigenous applicants and review the current application process for Indigenous applicants to Canadian medical schools. In summarizing through a thematic analysis approach, the current process and supportive literature, further recommendations can be made to stakeholders and those involved in Canadian Medical School Admissions for Indigenous applicants.

Methods

Following the methodological framework for conducting a scoping study by Arksey and O'Malley (2007), a structured approach was applied to this research project.[11]

Stage 1 - Defining the research objective

The objective of this scoping review is to assess and summarize current standards and admission process requirements for Indigenous medical student applicants used by Canadian medical schools. It is important to

identify if any changes in application metrics and processes have occurred since the 2019 JCIAH recommendations.

Stage 2 - Conducting the literature search

A grey literature search of our current admission requirements, interview processes, and other relevant data from each medical school was performed. Data from each medical school's admissions home page was reviewed and confirmed to be up to date. A literature survey was conducted for qualitative studies examining relevant academic metrics as biases for Indigenous applicants or marginalized populations. There is little empirical research on the admission process for Indigenous applicants to Canadian Medical Schools[12] and the role of medical school admissions in overcoming barriers for Indigenous applicants.[13]

Stage 3 - Study selection

The requirements for Indigenous applications to each medical school were reviewed and compared. The tools for academic metrics utilized by these institutions were examined for literature and research studies indicating bias or disadvantages for Indigenous candidates. Using a thematic synthesis approach to combine the medical school application processes for Indigenous students at the 17 Canadian medical institutions, key themes were identified to explore as barriers to admissions for Indigenous students. Descriptive themes of inferred barriers to Indigenous applicants from the identified reference literature were also included in the thematic synthesis.

Stage 4 - Mapping the data

Tables demonstrating the following categories were constructed: The minimum application requirements for each school (Table 1), additional requirements for Indigenous applicants (Table 2), and potential distribution of Indigenous students in a scenario with equitable seat allocation for Indigenous populations (Table 3) and adjustments to the regular admission evaluation process for Indigenous students (Table 4).

Stage 5 - Summarize, synthesize, and report the results

The requirements for Indigenous applicants and the presence of facilitated Indigenous Admission Programs (FIAP) of each medical school were reviewed and compared. The tools for academic metrics utilized by these institutions were examined for literature and research studies indicating bias or disadvantages for Indigenous candidates. Relevant and data identified was then categorized as academic metrics and non-academic metrics requirements of impact on admission for Indigenous students to Canadian Medical Schools. Academic requirements vary with minimum cumulative grade point averages (GPA), three or four years of an undergraduate degree, and writing one or more sections of the Medical College Admission Test (MCAT). Other requirements might include prerequisite courses, a situational judgment test (SJT), or full-time student status for a certain number of terms or years. An interview is often required as part of the medical school admission process. Non-academic metrics included proof of ancestry, time, and money.

Stage 6 - Consultation

Expert consultation and feedback from several McMaster Indigenous Faculty, Indigenous and non-Indigenous students, Admissions Committee and Undergraduate Deans of Medicine was sought out throughout the review process. Findings were presented for review, feedback and engagement at the International Congress of Medicine Conference, Quebec City, April 15, 2023. Attendees of the oral presentation session encouraged distribution to those involved in the Canadian Medical Education realm and Admission Committees at Canadian Medical Schools.

Results

Review of current admission practices and metrics associated with Indigenous applications to Canadian medical schools demonstrated heterogeneity of the application process for Indigenous students. Identified barriers were categorized into academic and non-academic barriers for Indigenous students. All Canadian medical schools require Indigenous applicants to meet varied minimum academic criteria compared to non-Indigenous applicants for various admissions tools. Requirements vary with minimum cumulative grade point averages (GPA), three or four years of an undergraduate degree, and writing one or more sections of the Medical College Admission Test (MCAT). Other requirements might include prerequisite courses, a situational judgment test (SJT), or full-time student status for a certain number of terms or years. The study examined different Indigenous streams for admission including facilitated Indigenous admission processes for each institution.

Table 1. Minimum academic requirements for Indigenous applicants

	In-province status for all applicants	GPA	MCAT	SJT	Prerequisite courses	Full-time status
Memorial[81,82]	No	No minimum	Yes - no minimum	Casper	No	No
Dalhousie[83,84]	No	3.7/4.0	Total score 500-503 based on GPA	Casper	No	No (as of 2021-2022)
Quebec First Nations and Inuit Faculties of Medicine Program[77,85]	Only available to Quebec residents	Cote R 28 or 3.2/4.0	Not required	Casper	School-dependent	School-dependent
Ottawa[86]	N/A*	3.5/4.0	Not required	Casper	Yes	Yes, 3 years
Queen's[87,88]	N/A*	3.0/4.0	120 in each section	Casper	No	No
Toronto[89,90]	N/A*	3.6/4.0	125 in each section with allowance of 124 in one section	No	Yes	Yes**
McMaster[91]	N/A*	3.0/4.0	123 in the CARS section only#	Casper	No	No
Western[92,93]	N/A*	3.3/4.0	50th percentile	No	No	Yes, 2 years
NOSM[76]	N/A*	3.0/4.0	Not required	No	No^	No
Manitoba[94]	Yes	3.3/4.5	Yes - no minimum	Casper	No	No
Saskatchewan[74]	Yes	75%	Cohort-dependent@	Casper	No	Degree must be completed in ≤ 5 years
Alberta[95]	No	IP: 3.3/4.0 OP: 3.5/4.0	IP: 124 in each section OP: 128 in CARS and 124 in each other section	Casper	No	Yes, 1 year
Calgary[96]	Yes	3.2/4.0	Yes - no minimum	No	No	Yes, 2 years+
UBC[75]	Yes	75%	124 in each section	No	Yes	No

**No distinction based on residency status.*
***Part-time courses are counted towards meeting the prerequisite and degree requirements, but they are not included in the GPA calculation.*
 # In order to reduce barriers for Indigenous applicants, provision of MCAT scores may be deferred beyond the application deadline…after invitations to interview are sent out in early February.
^It is expected that applicants with majors in science complete at least two (2) full course equivalents in arts, social sciences and/or humanities, and that applicants pursuing majors in arts, social sciences and/or humanities complete at least two (2) full course equivalents* in science.*
@The Admissions Committee reviews all of the applicant pool MCAT scores and sets the minimum overall MCAT and section scores for the current cycle. In the last two cycles, a total MCAT score of 492 and minimum section scores of BBFL 123; CARS 122; CPBS 123; PSBB 123 were set as cut scores by the Admissions Committee. Similar cut scores are likely to be used again in the upcoming cycle, therefore applicants with MCAT scores under these previous cut score thresholds are encouraged to retake the MCAT.
+Potential applicants may petition this requirement if barriers prevented FT studies.

Indigenous stream specific requirements

All applicants to Canadian Medical Schools must meet specified criteria for admission. There are differences in the admission criteria however for Indigenous applicants. All Canadian medical schools require students applying under an Indigenous stream to submit additional documentation. (Table 2). Documentation requirements can include proof of ancestry, a focused personal letter, and written endorsement of support from home Indigenous communities. The requirements of each school may differ and is available on each medical school's institution admissions web page. One exception is Dalhousie University, in which the admission requirements for Indigenous applicants are not made public.

Applicants must submit proof of Indigenous ancestry. This typically means a copy of an Indian status card, Métis citizenship card from a provincial branch of the Métis National Council, or Inuit enrolment card. Some schools are more flexible with the type of documents they accept, including written confirmation from a band council or from the Department of Indian Affairs. Other schools may require specific confirmation of Indigenous ancestry, reviewed by an Indigenous Admission Panel for validity.

A personal letter is a requirement for most applications. Schools usually request that this letter discusses motivation to study medicine, personal history and identity, and connection to Indigenous communities. It is usually used as part of a holistic file review. All but two schools require the personal letter: it is an optional submission for Calgary, and not requested for Saskatchewan.

A letter of support from a member of the applicant's Indigenous community is frequently requested. Like the personal letter, the support letter helps situate an applicant in their community and underpins Indigenous identity.

Minimum academic requirements specific to Indigenous students

An overview of minimum requirements for Indigenous applicants to apply to Canadian medical schools is observed in Table 1. Requirements are variable, which can pose a challenge for applicants wishing to apply to multiple schools. Several medical schools no longer require prerequisite courses, which improves access for non-traditional applicants.

Table 2. Additional requirements for Indigenous admission stream

	Formal documentation	Letter of support from community
Memorial[82]	Yes	Yes
Dalhousie[84]	Not published	Not published
Quebec First Nations and Inuit Faculties of Medicine Program[77]	Yes - accepts only First Nations and Inuit students	No
Ottawa[97]	Yes	Yes
Queen's[87]	Yes	Yes
Toronto[73]	Yes	No
McMaster[98]	Yes	Yes
Western[92]	Yes	Yes
NOSM[76]	Yes	Yes
Manitoba[94]	Yes	No
Saskatchewan[74]	Yes	No
Alberta[99]	Yes, notarized	Optional
Calgary[96]	Yes	No
UBC[100]	Yes	Yes

Minimum requirements are often different for all applicants based on their residency inside or outside the home province of the medical school. For example, the minimum academic average required for residents of British Columbia is 75%, while out-of-province applicants must achieve a minimum of 85% for consideration.[14] Most schools assign in-province minimum requirements to Indigenous applicants regardless of their residency status. The Maritime schools and the Quebec pathway are the only ones who do not, to increase recruitment from local Indigenous populations. Ontario is the only province that does not make a distinction between in- and out-of-province applicants, although the Northern Ontario School of Medicine (NOSM) considers Northern Ontario residency in their algorithm.[15]

Facilitated Indigenous admissions program strategies

In addition to creating specific streams for admission, some medical schools have developed strategies for optimising evaluation of their Indigenous applicants. These include provincial programs, seat quotas reflective of local demographics (Table 3), holistic file reviews to contextualize academic results, adjustment of the algorithm used to calculate a file score, and interviews for Indigenous applicants conducted with Indigenous faculty, students, and community members.[16,8,13] A simple step taken by some schools is to invite all Indigenous applicants who meet minimum requirements to interview.[17]

Table 3. Potential distribution of Indigenous students in a scenario with equitable seat allocation for Indigenous populations

	Total provincial medical school seats[2]	Population[3]	Population /seat	Indigenous population[4]	Equivalent seats for Indigenous students[5]	Institution	Medical school class size, 2019[1]	Current distribution of total provincial seats[6]	Equivalent distribution of Indigenous seats[7]
NL	80	473,991	5,925	45,725	8	Memorial	80	100%	8
NS	125	872,103	6,977	51,495	7	Dalhousie	125	100%	7
QC	943	7,981,471	8,464	182,890	22	Sherbrooke	214	23%	5
						McGill	203	22%	5
						Laval	225	24%	5
						Montreal	301	32%	7
ON	985	13,074,099	13,273	374,395	28	Ottawa	167	17%	5
						Queens	109	11%	3
						McMaster	203	21%	6
						Western	171	17%	5
						Toronto	269	27%	8
						NOSM	66	7%	2
MB	110	1,055,055	9,591	223,310	23	Manitoba	110	100%	23
SK	100	923,337	9,233	175,015	19	Saskatchewan	100	100%	19
AB	338	3,808,535	11,268	258,640	23	Calgary	170	50%	12
						Alberta	168	50%	11
BC	288	4,377,470	15,200	270,585	18	BC	288	100%	18
					136	Totals	2969		

1) Source: CMES. 2019 is the last year for which there are data publicly available; 2) Not included: The territories, PEI and NB. At time of data collection, PEI distributed its seats to MUN and Dalhousie. NB distributed its seats to MUN, Dalhousie and Sherbrooke. It is unclear how those university programs distributed seats for Indigenous students living in those provinces; 3) Total population minus Indigenous population. Statistics Canada 2016 Census, last year for which data are available. Source https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/hlt-fst/pd-pl/Table.cfm?Lang=Eng&T=101&S=50&O=A; 4) Statistics Canada 2016 Census, last year for which data are available. Source: https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/hlt-fst/abo-aut/Table.cfm?Lang=Eng&T=101&S=99&O=A); 5) Calculated as the provincial ratio of seats to population, applied to the Indigenous population. Note, this column does not include equitable seats, but equivalent; 6) Calculated as all provincial seats divided by the proportion of each school's seats; 7) Calculated as the provincial ratio of seats to population, applied to the Indigenous population, for each school's distribution of seats. Note, this column does not include equitable seats, but equivalent.

Table 4. Adjustments to regular admission evaluation process for Indigenous students.

	Seat quota	Adjusted final score calculation	Holistic file review	Indigenous interviewers
Memorial[25,82]	3 for NL residents	No	Yes	Yes
Dalhousie[25,84,101]	None	No	Yes	Yes
Quebec First Nations and Inuit Faculties of Medicine Program[25,77]	Maximum of 6 for Quebec residents	Yes	Yes	Yes
Ottawa[25,97]	Maximum of 7	No	No	Yes
Queen's[25,87]	Maximum of 4	No	Yes	Yes
Toronto[25,73]	None	No	No	Yes
McMaster[25,98]	None	No	Yes	No
Western [25,92]	Maximum of 5	No	Yes	Yes
NOSM[25,76]	Minimum of 4	Yes	No	No
Manitoba[25,94]	None	Yes	Yes	Yes
Saskatchewan[25,74]	Maximum of 10	No*	Yes	No
Alberta[25]	None**	No	No	Yes
Calgary[96]	None	No	Yes^	No
UBC[25,102]	5% of the class	No	Yes	Yes

**Indigenous applicants are assessed as part of a separate stream. Calculation used is the same as for applicants to the regular pool, but the pool of Indigenous applicants is smaller.*
***All Indigenous applicants who meet the application requirements and who are successful in the Indigenous admissions process will be recommended by the Indigenous Admissions Subcommittee to the MD Admissions Committee for admission.*
^A member of the Indigenous community will participate in the file review process.

***Provincial program*.** Quebecois schools employ a province-wide approach to the admission of Indigenous students. The Quebec First Nations and Inuit Faculties of Medicine Program is an agreement between the four Quebec medical schools and the provincial government to admit First Nations and Inuit students with Quebec residency. It does not accept applications from Métis students or Indigenous students from other provinces. Students may choose which schools they would like to apply to, and all interviews are conducted at McGill. The program offers a total of six seats across the province.[10,18,19] This number has not increased in a significant manner for years, though the government believes the program is a "success" and is "reducing Indigenous health inequalities in Quebec."[20]

***Seat quotas*.** Outside of Quebec, seven medical schools use seat quotas. It is unclear how most schools arrive at their quotas, although UBC (University of British Columbia) and NOSM, choose a number based on the demographics of the area they serve. NOSM's quota of four seats is a minimum, whereas all the other schools with quotas specify a maximum; it is unclear whether they fill these seats most years. Criticisms of quotas include that they fail to reflect the diversity of Indigenous peoples and that this approach ignores structural barriers and the influence of intergenerational trauma in home environments which can limit the academic opportunities for Indigenous students to fulfill the necessary requirements for medical school admission.[17]

Another issue with the current quotas in place is that they are not high enough to meet the current demographic need, let alone correct Indigenous underrepresentation in medicine (Table 3). It would take many years of overrepresentation of disadvantaged applicants to redress the current shortage of Indigenous medical students.[12,21] Even after multiple calls over the last several years to increase the number of Indigenous medical students, Canadian universities are not keeping pace. If the number of medical school seats per population was the same for Indigenous students as it is for non-Indigenous students, every province in the country would need to add multiple seats to make up the current deficit. The province of Quebec, which currently has six seats earmarked for Indigenous students, would have twenty-two seats to truly reflect the seat quotas necessary to support Indigenous students at the same rate as non-Indigenous students.

***Score adjustments*.** Another approach for medical schools suggested by the JCIAH, is adjusting the way that an applicant's file score is calculated. This has been used extensively by NOSM, as it adjusts the calculation of an Indigenous applicant's "context score" to increase the number of matriculated Indigenous students to meet their targets.[12] The context score is based on several criteria, including rurality, years lived in Northern Ontario, and Francophone or Indigenous identity.[15] Similarly, the University of Calgary uses a z-score based on a historic pool of Indigenous applicants to evaluate scores on the GPA, MCAT and MMI.[18]

***Holistic file review*.** Holistic file review varies significantly from school to school. It typically means that a file is reviewed in its entirety, taking GPA, MCAT scores, and other elements such as work and volunteer experience into consideration in the context of a student's life experience and circumstances. This is in contrast with a standard review, which might just include academic and interview scores without context. Indigenous reviewers often conduct these evaluations to ensure they are culturally appropriate and grounded in Indigenous worldviews. (Table 4)

Interview. The interview is the final hurdle for applicants to medical school. Schools take various approaches when attempting to mitigate structural barriers for Indigenous applicants during the interview process. Some medical schools have either an Indigenous interviewer present for an applicant's interview or offer an additional panel interview with Indigenous interviewers. (Table 5)

Table 5. Interview processes for Indigenous students

	MMI or Panel	Interview Preparation Program
Memorial[102]	30 min panel, 6 MMI stations	No
Dalhousie[84]	MMI	Yes
Quebec First Nations and Inuit Faculties of Medicine Program[77]	MMI	No
Ottawa[25,97]	Panel including Indigenous Program Director and community member	No
Queen's[97]	MMI, then panel offered to applicants successful in the MMI	No
Toronto[103]	MPI (4x12min stations)	Yes, through Community of Support
McMaster[25]	MMI	Yes, MSEI
Western[92]	Panel	No
NOSM[104]	MMI	No
Manitoba[94]	MMI and additional Indigenous panel interview	Yes, MSEI
Saskatchewan[74]	MMI	No
Alberta[25,95]	Traditional and MMI-style questions, additional Indigenous panel interview	No
Calgary[96]	MMI	Yes
UBC[100]	MMI and additional Indigenous panel interview	No

The interview is a subjective measure of a student's potential. However, traditional medical school interviews have been shown to disadvantage some racial groups.[223] While many studies have shown much-improved or even neutral diversity impacts of multiple mini-interviews (MMIs),[23-27] others contend candidate differences do affect evaluation outcomes, such as culture, language, maturity, past experience, and personality types.[28] Canadian work has also shown MMI scores correlate negatively with Indigenous ["Aboriginal"] status; these students may also be affected by a more general bias against small and rural communities.[29] One study showed having more Indigenous interviewers did not change MMI scores, but did recommend MMI stations be vetted by culturally-sensitive experts.[301] A review suggested careful monitoring of the impact of the MMI and other policies on the admissions of Indigenous students, and suggested enhancing other admissions policies as a result.[31]

Support programs that prepare applicants for the interview exist at some medical schools. The Medical School Entrance Interview preparation program, developed by the Indigenous Physicians Association of Canada[32] and offered at the University of Manitoba and McMaster, is a three-day program designed to help Indigenous applicants develop answers to common interview questions, with a mock interview for practice. Other schools offer less formal support. For example, the University of Calgary pairs applicants with a current medical student who helps guide the applicant through the admissions and interview process.[10]

Interviews are typically either structured as a traditional panel or an MMI. UBC, the University of Alberta and the University of Manitoba all require applicants to attend the typical MMI interview and an additional panel style interview with Indigenous interviewers. Some schools offer support for Indigenous applicants during the interview process, including space to smudge and access to Elders.

Barriers for Indigenous applicants – academic metrics

The medical school admissions process presents intended and unintended barriers to all potential applicants. Intended barriers include academic requirements, such as maintaining a high school average that allows an applicant entrance to a university, partially or fully completed undergraduate degree with a grade point average (GPA) above the minimum required by medical schools and completing the Medical College Admission Test (MCAT).

The difference between minimum criteria and competitive application criteria. Given the competition, meeting minimum requirements in the traditional stream is not enough for admission. There is a notable difference between the minimum scores and competitive scores required for admission for all applicants. For example, McMaster University's class of 2023 statistics shows the mean GPA of entrants was 3.89/4, while the minimum GPA to apply is 3.00/4.[33,34] Similarly, the mean MCAT Critical Analysis and Reasoning Score was 129, while the minimum to apply is 123.

Use of admissions tools which may disadvantage Indigenous applicants. Most Canadian universities use the MCAT, GPA, SJT, and interviews as minimum requirements, and then use those scores to rank applicants. It is argued that use of these tools only perpetuates the recruitment of

eventual doctors who want to work in high-demand specialties in affluent, urban locations. A recent review of Black and Indigenous applications to Dalhousie University indicated the MCAT was the most common component to render an applicant ineligible for interview invite.[37]

MCAT. The use of the MCAT by some Canadian universities disadvantages Indigenous students. In the US, Black and Latino students score lower on the pre-2015 MCAT than white students.[28-30] Persistently lower scores from minority groups have led some to advocate that admissions processes which use the MCAT are prejudicial to minority students,[31-32] and some schools have already applied modifiers for underrepresented students.[33,34] Some believe requiring the MCAT at all is a barrier to entry for disadvantaged groups,[22,35] particularly Indigenous students.[36] Using the MCAT at all is also questionable for Indigenous applicants, as the MCAT is not as useful for predicting performance for minority students as it is for majority group students[37] It may also have varying degrees of predictive validity across ethnic groups, so a systematic bias against non-whites cannot be assumed.[38.39] Further, the use of the MCAT may not even be a helpful predictive tool; evidence from previous and new versions of the MCAT exam reveals that students with a broad range of scores are capable of progressing through medical school on time, graduating in four or five years, and passing their licensure exams on the first attempt.[40,41] Medical students with scores in the middle of the score scale perform at nearly identical levels as students with scores in the upper third of the scale.[31]

***GPA*.** GPA scores are known to strongly depend on socioeconomic class of the student.[42] Underrepresented groups have significantly lower GPAs,[21, 43] and this has also been shown specifically in the Indigenous context.[24] Many factors may contribute to lower academic metrics among underrepresented minority students (URMs) vs. non-URMs and those with socio-economic difficulty, including decreased access to educational resources from an early age, lower quality schools, greater employment demands during college, and lack of financial means for test preparation classes or materials.[12]

Situational Judgement Tests (SJT). Billed as a "diversity-neutral" tool, the situational judgment test is not without problems. Multiple studies have shown whites do better than non-whites on SJTs, especially Black or African American applicants.[44-46] Other studies suggest White test-takers perform better on SJTs than Black, Hispanic, and Asian candidates.[47,48] It is unclear why ethnicity appears to impact SJT performance, but one can hypothesize how it could be linked to life-long differences in education and opportunity.[37]

Barriers other than academic metrics

***Time and money*.** Situation and circumstances can affect academic outcomes. Indigenous applicants are more likely to come from a disadvantaged background with underfunded schools and lack of access to educational resources.[8] They may have needed to work during high school and while pursuing an undergraduate degree and may not have been able to afford preparation classes for tests such as the MCAT.[17,21] Some simply may have grown up in a household that did not assign value to Western education. Many Indigenous communities are distant from post-secondary institutions and potential students may be reluctant to leave their support systems.[37] Indigenous applicants are more likely to be non-traditional and may be older with work experience or lacking a science background. These factors make it difficult for an Indigenous person to qualify to apply to medical school, let alone present a competitive application.

Some schools also require students to maintain a full course load during part of their degree, to demonstrate that applicants can manage the rigours of medical school. This can be a significant barrier for students who worked during their post-secondary studies, who were caring for family members or who had other pressing demands on their time.

Even the cost of applying to medical school can be enormous. Writing the MCAT currently costs $325 USD;[38] there is a fee assistance program which reduces the cost to $130 USD. Medical school application fees range from $70 at Dalhousie[39] to $230 at Memorial.[40] Prior to Covid-19, medical school interviews were in-person, requiring an applicant to fund travel to each school where they were interviewing, and which may require taking time off work. It is unclear if in-person interviews will return in the future. Applying to several schools could cost upwards of $1,000 in fees, plus the cost to travel for interviews.

***Proof of ancestry*.** Confirming Indigenous status with formal documentation is not always straightforward. For Métis applicants, most schools accept only citizenship cards issued by one of the five provincial branches of the Métis National Council. Citizenship typically requires providing genealogical proof of a Métis or "halfbreed" ancestor, ideally with a primary source document such as a scrip[41] Applicants unable to pay an agency to assist with

genealogical research, or whose lineage is not from a place covered by an agency, need to do the research themselves.

Barriers faced by First Nations applicants needing a status card include the time needed to review the request, which can take up to two years.[42] The process can also be complicated by adoption status, an incomplete birth certificate, and sex-based inequities.

For Inuit applicants requesting enrolment to one of the four Inuit land claim regions, application procedures and information required vary widely. Some require extensive genealogy, a percentage of Inuit ancestry for each relative in the family tree, and narrative explanation of connection to the lands.

Some schools acknowledge the difficulty of obtaining formal documentation. The University of Toronto is flexible with the types of documentation it accepts. It also offers support from the Indigenous Student Application Program staff for applicants having difficulty supplying formal documentation of identity.[43] Saskatchewan offers assistance with obtaining acceptable proof of identity through its admissions office.[44]

Finally, most schools require a letter of support from a community member confirming Indigenous identity. This is used as confirmation that the applicant is engaged with their community but can be a barrier if colonial policies have distanced the person from their ancestral community.

Discussion

In December 2015, the Truth and Reconciliation Commission of Canada published 94 Calls to Action designed to support reconciliation efforts and begin reparations for the legacy of residential schools.[45] Call to Action 23 underlined the need to increase representation of Indigenous people in the healthcare field, to work on improving retention of Indigenous health care professionals for Indigenous communities, and to require all health care professionals to undergo cultural competency training.[45] It would also contribute towards meeting Article 23 of the United Nations Declaration of the Rights of Indigenous Peoples, which states that "…Indigenous peoples have the right to be actively involved in developing and determining health…programmes affecting them, and as far as possible, to administer such programmes through their own institutions,"[46] allowing communities to control their own health services as much as possible.[16]

Training more Indigenous physicians would increase the number of doctors able to provide culturally appropriate care. Indigenous physicians are more likely to care for Indigenous patients.[47] A physician's race and ethnicity are strong predictors of specialty choice and care of under-resourced populations.[13,21,47,48,22,48,49] Research shows minority patients tend to seek care from minority physicians and report greater satisfaction in these encounters.[49] Increasing the number of Indigenous physicians in the workforce would help to bridge the gap in appropriately trained health care providers for rural and remote regions, as well as provide culturally-competent physicians capable of using a two-eyed seeing approach[50] for both urban and rural Indigenous patients.[16] A two-eyed seeing is an approach of curiosity, inquiry and solution development in which people come together to view the world through an Indigenous lens with one eye (perspective), while the other eye sees through a Western lens.[50]

Despite the goals of the Future of Medical Education in Canada 2020 project to increase diversity across admissions and student affairs, no serious progress has been made to date.[52] Indigenous people continue to be underrepresented in the medical profession. The 2016 census identified that approximately 0.8% of Canada's physicians were Indigenous, while more than 4.5% of the population identifies as Indigenous.[37] The disparate ratio of Indigenous physician care providers is heavily influenced by the number of Indigenous students accepted to medical schools. A survey of four Canadian medical schools in 2009-2011 reported 0.9% of students self-identified as Indigenous; this has changed little from a 2001 study which reported 0.7% of medical student respondents self-identified as Indigenous.[8,16] Without the presence of Indigenous people as medical students and physicians, lack of role models and mentors can influence future generations to choose medicine as a profession.

The lack of a role model in healthcare can influence the career choices of Indigenous children or adolescents. Indigenous students may not feel like they are capable of meeting academic entrance requirements, or that they are not "what [medical schools] would be looking for."[66] During pursuit of an undergraduate degree, some students encounter discrimination from their classmates and may feel "less worthy"[18] of a place in a medical school. Admission pathways designed to mitigate structural bias may result in stereotyping, and Indigenous students may hear messaging from their peers that they receive unfair

advantage. These experiences may encourage Indigenous undergraduate students to keep their identity a secret to help them fit in, or it may discourage their application entirely.[8,17]

The sequencing and weighting of various admissions tools

Data suggest relying on GPA and MCAT up-front, as minimum requirements, limits diversity. Their common use as "gatekeeping" admissions tools also limits the functional ability of other, diversity-neutral options more often used as "fine-tuning" admissions tools.[13,54,55] Subsequently altering the weighting of admission tools later in the process to reduce their disadvantage to underrepresented groups misses the plot;[13] by using minimum admission requirements, a large number of applicants have self-selected out of the running by the time diversity-promoting (or even diversity-neutral) measures are applied.[37, 55] There is concern that intervening in the admissions process may increase the competitiveness of Indigenous candidates, but does not necessarily increase the candidate pool.[13] Reducing or removing academic requirements can reduce this impact,[55] and could further illuminate the reasons for the low numbers of applications from Indigenous students seen in Canada.[21,56]

To summarize the academic barriers as above, a history of structural oppression and reliance on admissions tools with known biases against Indigenous students means equitable evaluation based on those tools may be a challenge. The existing development of strategies to mitigate this gap acknowledges that there is not a significant difference between the ability of the average Indigenous applicant and the average non-Indigenous applicant to succeed in medical school; rather, the gap in performance on standard admissions tools reflects historical privilege and systemic bias.[17]

If minimum requirements are seen as essential, most commentators on the use of GPA scores suggest setting a reasonable minimum threshold, but not using them to rank applicants. By taking this approach, admissions standards would not be compromised, and diversity could be increased.[13] Another approach includes using medical school mission statements to choose candidates who best fit with the institution's values.[57] A greater focus on institutional mission is more likely to produce more diverse students.

The Northern Ontario School of Medicine (NOSM) has expended considerable effort to meet their socially accountable mandate; the school reviewed their admissions data and found that the admissions rate of Indigenous students from 2006-2015 was below their admission target of 12% of the class—approximately eight seats—based on the demographics of Northern Ontario. They adjusted their context scoring to increase representation of Indigenous students, resulting in meeting their target in 2016 and 2018, with seven seats filled in 2017.[21]

Examining the current application process to Canadian medical schools, barriers were identified which may limit successful enrollment in medical school physician training programs for Indigenous applicants. Progress has been made since the inception of the JCAIH action statements, but required adaptations and actions remain heterogeneous. Medical schools have variously reported increased numbers of seats, added support staff, and data collection. There are no current attempts to assess or provide an update for the progress medical schools have been making since the JCAIH in their actions to increase recruitment and retention of Indigenous medical students.

Recommendations - need to summarize

In 2015, the Truth and Reconciliation Commission clearly laid out the moral obligation of health professional training institutions to respond to the needs of modern Indigenous peoples in Canada. Recommendation 23 calls for more Indigenous health professionals, better retention of those professionals in Indigenous communities, and cultural competency training for all health professionals—Indigenous or not. Canada's universities have not met that obligation, but there is a path to reducing barriers to Indigenous applicants and improving their number.

We suggest that the current model in Canada of each institution admitting Indigenous applicants in similar but separate ways, maintaining additional barriers for Indigenous applicants, and measuring and reporting on their success with different methods is not helpful to achievement of the goal. To establish best practices associated with meeting the obligations of the Truth and Reconciliation Commission's Recommendation 23, we have prepared a summary table of recommendations. (Table 6)

Similarly, and outside the scope of this text, there are opportunities for action targeted to non-Indigenous medical school stakeholders. An inclusive environment with appropriate cultural support and training for non-Indigenous students and faculty is also needed for an Indigenous candidate to succeed.

Table 6. Recommendations to address Call to Action 23.

Stakeholder	Challenges	Recommendations
Executive Committees/ Admission Committees	1. Lack of diversity in current medical school students 2. Lack of cultural support for students from marginalized populations	1. Review commitment plan and activities to date which address Call to Action 23 and the FMEC 2020 vision. 2. Examine their local Facilitated Indigenous Admission Process in light of these recommendations.
Admission Committee	1. Disproportional numbers of Indigenous Medical School applicants and Indigenous Medical Students to representative population ratio.	1. Examine feasibility for pipeline program. 2. Waive application fees for Indigenous Medical Students 3. Establish mentorship program for Indigenous Medical School applicants with promotion/listing of Indigenous Faculty on University application websites
Admission Committee/ Quality Reform Committee/ Evaluation Committee	1. Tools and resources used in application to medical school are barriers for some Indigenous applicants	1. Remove MCAT requirements for Indigenous applications. 2. Set a minimum GPA as an application criterion only, not to be used as a ranking tool. 3. Proof of ancestry for Indigenous applicants should be evaluated by Indigenous community members or committee.
Admission Committee/ Interview Committee	1. Disparity amongst medical schools for differing practices and requirements for admissions and interview process for Indigenous medical applicants.	1. Holistic file review, algorithm score, calculation adjustment, interviews conducted with Indigenous community members. 2. Establish a formal interview support program/interview mentor program.
Executive Committees/ Admission Committees	1. Disproportional numbers of Indigenous Medical Students to representative population ratio	1. Establish a minimum number of Indigenous students and set their proportional share for population parity.
Association of Faculties of Medicine in Canada	1. Lack of data and current statistics on actions regarding Indigenous students	1. Report annually on applicants, strategies to improve applicant numbers and current entrants in a standard format through the Association of Faculties of Medicine in Canada. 2. Survey of all current Indigenous students and applicants. 3. Work towards a standardized process for admission for Indigenous applicants.

Summary

This report builds on the extensive work of others and an examination of current policies, which have been summarised several years after TRC Recommendation 23 was issued. Ideas for accelerating achievement of the Recommendation is summarised in a comprehensive and actionable set of recommendations below.

It is time to recognize the ongoing barriers Indigenous applicants face to enter medical school in Canada. Stakeholders have a role to play to meet the opportunity so clearly articulated for us by the Truth and Reconciliation Commission of Canada. For the health of future generations of Canadians and Indigenous peoples, the opportunity should not go to waste.

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