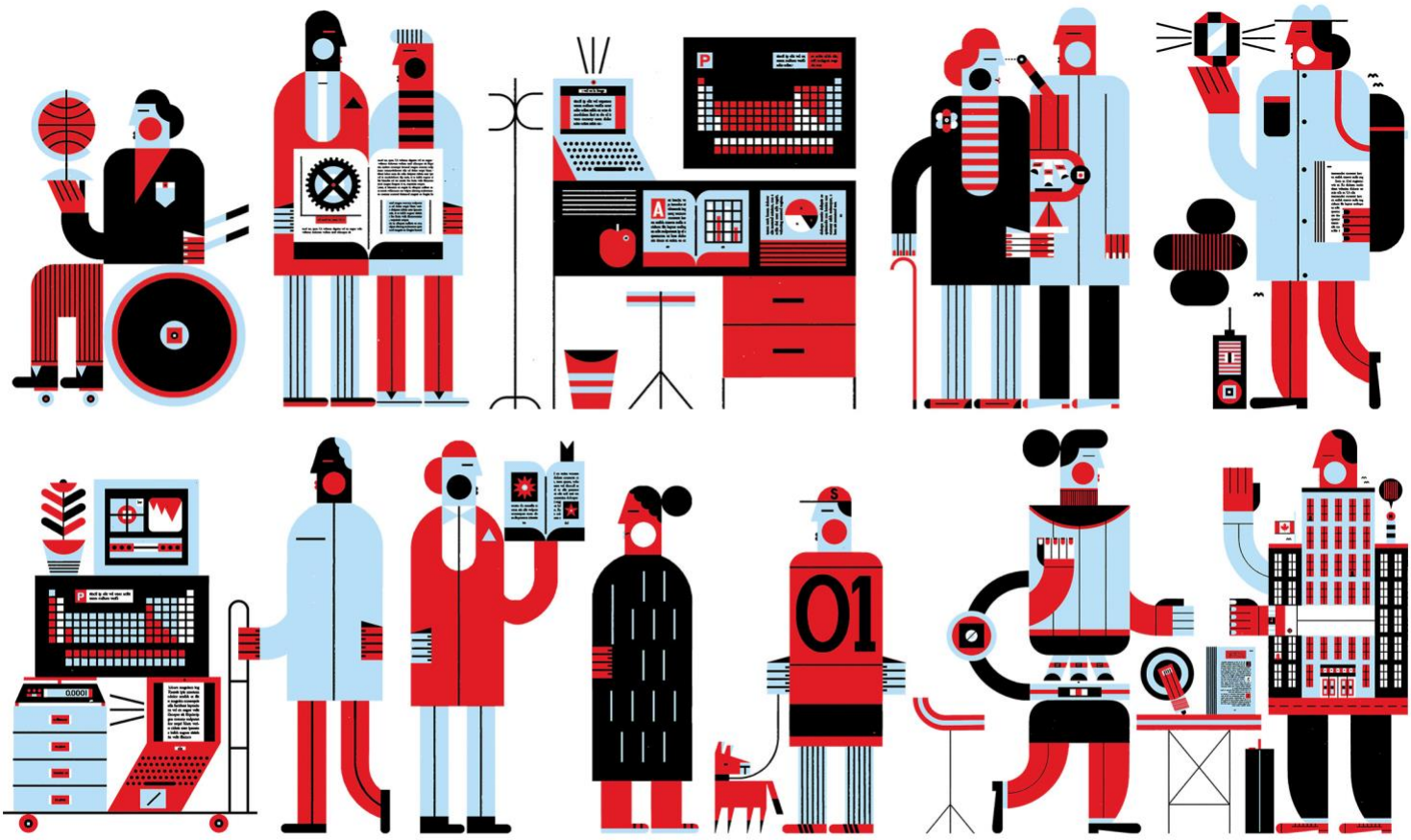
Gender Based Analysis Plus in NSERC Programs

Summary Report 2024



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Introduction

GBA Plus in the Government of Canada

Gender Based Analysis Plus is an analytical process used by the Government of Canada to assess how diverse groups of individuals may experience policies, programs and initiatives. The "Plus" recognizes that GBA goes beyond biological (sex) and socio cultural (gender) differences. We all have multiple identity factors that intersect to make us who we are; GBA Plus considers many other identity factors, like race, ethnicity, religion, age and mental or physical disability. Following GBA Plus methodology, as recommended by Women and Gender Equality Canada (WAGE), GBA Plus is an ongoing process and should be applied at all stages of an initiative's life cycle from design and development to implementation, monitoring and evaluation (WAGE 2022).

GBA Plus at NSERC

Guided by the Tri-Agency EDI Action plan, which seeks to provide equitable and inclusive access to funding opportunities and to influence the achievement of an inclusive post-secondary research system and culture in Canada, the Natural Sciences and Engineering Research Council of Canada (NSERC) is committed to critically analyzing its programs, policies and processes. As part of the strategies used to achieve this goal, NSERC uses GBA Plus to conduct intersectional analyses within its funding opportunities to consider the ways in which these are experienced by people from diverse groups within the natural sciences and engineering (NSE) research communities in Canada.

GBA Plus of NSERC's funding opportunities comprise quantitative analyses, including self-identification data and competition results; analyses of non-quantitative aspects of the programs such as program literature; qualitative analyses, which consider data resulting from surveys, consultations and stakeholder engagement; and reviews of the relevant literature from primary

and secondary sources. The results of GBA Plus work for programs at NSERC allow for the identification of persistent barriers to applicants and awardees, including those from rights-holding and equity-deserving groups[1], and lead to the proposal of recommendations to minimize or eliminate these barriers.

NSERC GBA Plus Summary Report: Methodological considerations

Between 2019 and June of 2022, NSERC conducted GBA Plus on fourteen of its funding opportunities[2] (Table 1). In this report, we summarize the main findings from the GBA Plus conducted for these funding opportunities and identify the main themes that arise from the recommendations proposed following each of these GBA Plus processes. The fourteen funding opportunities and the corresponding data from these analyses that were considered in this summary report are listed in Table 1.

Table 1. Information on NSERC funding opportunities for which a GBA Plus had been completed as of June 2022, including the stage relevant to the program's life cycle at the time that the GBA Plus was conducted, the data from each analysis that is considered in the current report, and the year that the GBA Plus was completed.

	Funding opportunity	Program stage	Data considered in this report	Year of GBA Plus
Discovery	Discovery Grants (DG)	Monitoring	• Competition results (2019 – 2022) • Program design and literature • Survey results	2022
	Research Tools and Instruments (RTI)	Monitoring	• Competition results (2019 – 2022) • Program design and literature • Stakeholder consultations	2021
	Discovery Institutes Support (DIS)	Development	• Program design and literature • Stakeholder consultations	2022
	Emerging Infectious Disease Modeling (EIDM)	Development	• Program design and literature	2020

	Funding opportunity	Program stage	Data considered in this report	Year of GBA Plus
Recognizing talent	E.W.R. Steacie Memorial Fellowships (Steacie) [3]	Monitoring	• Competition results (2009 – 2018) [4] • Stakeholder consultations • Program design and literature	2019
	Undergraduate Student Research Awards (USRA)	Monitoring	• Program design and literature	2020
	Donna Strickland Prize for Societal Impact of Natural Sciences and Engineering Research (DSP)	Development	• Program design and literature • Internal consultations	2022
	Brockhouse Canada Prize for Interdisciplinary Research in Science and Engineering (Brockhouse prize) [5]	Monitoring	• Program design and literature	2022
	Gerhard Herzberg Canada Gold Medal for Science and Engineering (Herzberg medal) [5]	Monitoring	• Program design and literature	2022
	John C. Polanyi award (Polanyi award) [5]	Monitoring	• Program design and literature	2022
	Post-doctoral Fellowships (PDF)	Monitoring	• Competition results (2019-2022) • Program design and literature	2022
	Synergy Awards for Innovation (Synergy)	Monitoring	• Program design and literature	2022
Promotion	Science Communication Skills (pilot)	Development	• Program design and literature	2019
	Encouraging Vaccine Confidence in Canada	Development	• Program design and literature	2022

The types of analyses conducted vary for each program. Much of the variation between analyses can be attributed to the stage in the programs' life cycle at which the GBA Plus was conducted, which determined the type of data that was available and the type of analyses that were possible. For instance, in the case of programs in early development stages, competition data may not be available and therefore these analyses focus on analysing the program literature being developed and other data types including qualitative data from consultations and/or data from other programs.

Despite variation between GBA Plus analyses, all fourteen funding opportunities investigated the impacts of different program aspects on diverse groups of individuals using reviews of current literature, quantitative and qualitative data when available, and/or non-quantitative aspects of the programs (e.g., program literature, program policies, etc.). Further, all analyses considered at least four equity-deserving and rights-holding groups: women, visible minorities[6], Indigenous Peoples, and persons with disabilities. Most analyses also considered other factors including, but not limited to, language of application, applicants' institutions' size and region, applicants' age and career stage at time of the application, and whenever possible, applicants' self-identification with other population groups. Note that at the time when GBA Plus were conducted for the programs under consideration, data on gender diverse groups (gender-fluid, non-binary, and Two-Spirit) were too limited to draw meaningful conclusions from statistical analyses and data on members of LGBTQI+ communities were unavailable. Therefore, one limitation of the analyses under consideration was that a thorough analysis of these groups was not possible at the time of writing this report. NSERC recognizes that existing literature points to the underrepresentation of these groups in STEM [Fisher 2021]. Accordingly, the self-identification questionnaire was updated in 2021 to better monitor these groups in future GBA Plus work at NSERC.

When available, analyses employing GBA Plus methodology use data from self-identification questionnaires and from competition results to calculate application rates (APR) and award rates (AWR) for diverse groups of applicants[7]. Specifically, APRs indicate the proportion of individuals from a given group who applied to the program out of all applications received, while AWRs indicate the proportion of awardees from a given group out of all awarded individuals. These values are calculated as shown below:

$$\frac{\text{Total \# of applications from Group A}}{\text{Total \# of applications}} = \text{Application rate for Group A}$$

$$\frac{\text{Total \# of awardees from Group A}}{\text{Total \# of awards}} = \text{Award rate for Group A}$$

APRs and AWRs are used in GBA Plus as an indication of whether the process of assessing applications is fair and to monitor the participation of different groups in NSERC programs. Monitoring the APR of different groups against the larger Canadian population[8] (Statistics Canada 2021 Census) and the population of persons eligible to apply to NSERC's funding opportunities (Table 2, SPFR 2019) serve as a measure of fair access to programs, while monitoring the APR-AWR differentials year-over-year serves as a proxy to evaluate fair assessment of applications.

Table 2. List of programs for which quantitative data on competition results was available at the time when their GBA Plus was conducted and the corresponding populations of researchers from the natural science and engineering (NSE) disciplines who are eligible to apply for these NSERC programs (SPFR 2019).

NSERC program	Eligible population
Discovery Grants (DG)	NSE Post-secondary faculty in Canada
Research Tools and Instruments (RTI)	NSE Post-secondary faculty in Canada
E.W.R. Steacie Memorial Fellowship (Steacie)	NSE Post-secondary faculty in Canada

NSERC program	Eligible population
Postdoctoral Fellowships (PDF)	NSE PhD students in Canada[9] NSE Postdoctoral fellows in Canada

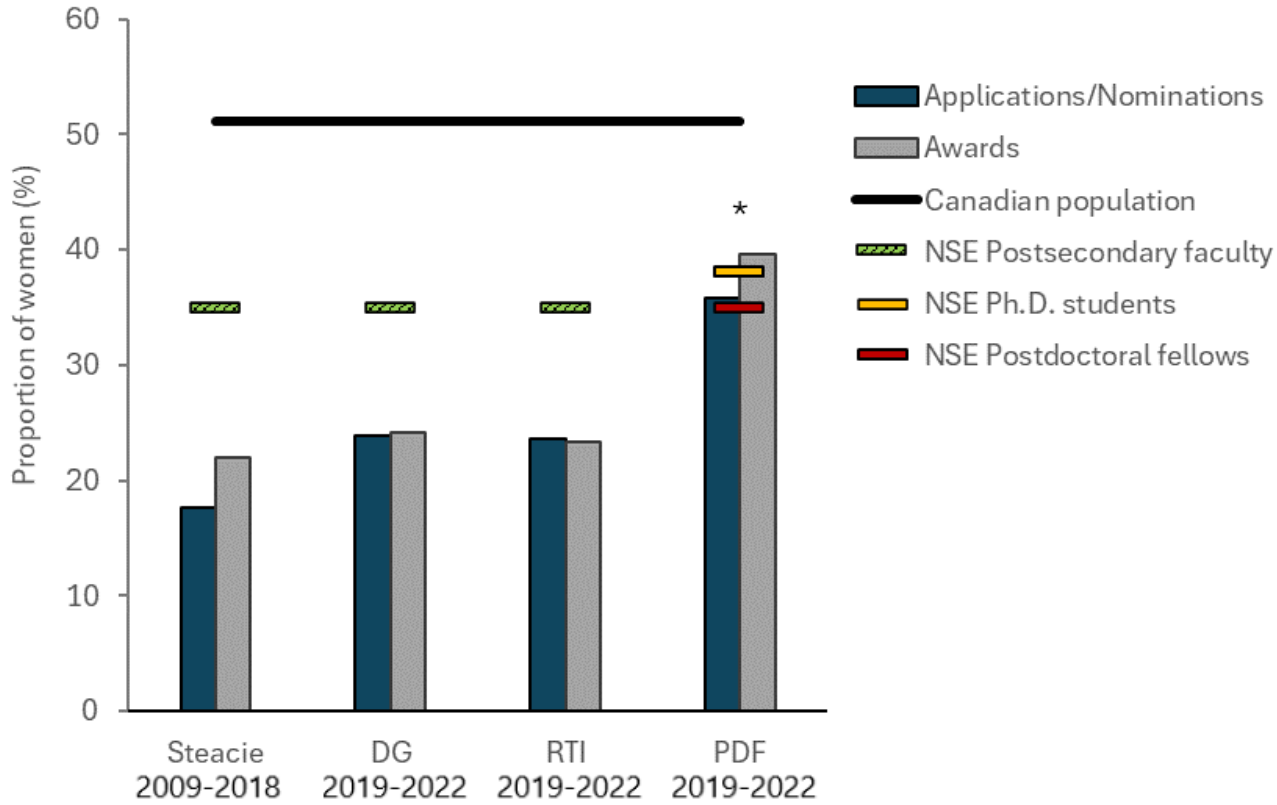
Table 2 provides information on the eligible population used for the different funding opportunities. The populations eligible to apply to a given funding opportunity vary according to each program's eligibility requirements. Data on eligible populations were gathered from the Survey of Postsecondary Faculty and Researchers (2019).

Summary of GBA Plus findings by group

Gender[10]

Competition results disaggregated by gender revealed an underrepresentation of women being awarded and applying or being nominated[11] for NSERC programs as compared to the representation of women over the age of 15 in the Canadian population (51.1%) as reported by the 2021 Statistics Canada census (Figure 1), and in the Canadian labour force as of December 2022 (47%) (Statistics Canada 2023b).

Figure 1: Proportion of applications and awards for persons self-identifying as women for four NSERC programs



▼ Text description of figure 1

Program	Applications/Nominations (%)	Awards (%)	Canadian population (%)	NSE Postsecondary faculty (%)	NSE Ph.D. students (%)	NSE Postdoctoral fellows (%)
Steacie 2009-18	17.6	22	51.1	35	-	-
DG 2019-22	23.9	24.1	51.1	35	-	-
RTI 2019-22	23.6	23.3	51.1	35	-	-
PDF 2019-22	35.8	39.6	51.1	-	38	35

▼ Explanation of figure 1

Proportion (%) of persons self-identifying as women in applications/nominations (blue) and awards (grey) for four NSERC programs (Steacie, Discovery Grants (DG), Research Tools and Instruments (RTI), and Postdoctoral Fellowships (PDF); Program competition data) as compared to the corresponding proportion of women in the Canadian population (solid black line; Statistics Canada 2021) and the populations eligible to apply to each program (SPFR 2019): NSE Postsecondary faculty for the Steacie, DG and RTI programs (striped green lines); NSE Ph.D. students (yellow line) and NSE Postdoctoral fellows (red line) for the PDF program. Asterisk (*) represents statistically significant differences between application rates and award rates (P<0.05). Application rates were found to be significantly lower than award rates for persons identifying as women for the Postdoctoral Fellowships program.

Further, although the proportion of women in the NSE who are eligible to apply to NSERC programs is relatively similar between the PDF (35% of post doctoral fellows and 38% of PhD students) and DG, RTI, and Steacie programs (35% of postsecondary faculty), the proportion of women applying to and being awarded to NSERC programs drops by over 10% from the PDF program to the DG, RTI and Steacie programs. Therefore, while in the PDF program the proportion of women applying to and being awarded is closely similar to the proportion of women eligible to apply to the program, this is not the case for the DG, RTI and Steacie programs; where women, who are in later career stages, seem to be underrepresented in applications and awards in relation to the comparable eligible populations.

Despite the observed underrepresentation of women, no significant differences were found between application and award rates for the Steacie (N=604, X^2=0.964, df=1, p =0.326), DG (N=10569, X^2=1.354, df=1, p =0.244) and RTI (N=3189, X^2=0.004, df=1, p =0.947) funding opportunities. One exception is seen in the case of the PDF program where, for women, the award rate was significantly higher than their application rate[12] (N=2261, X^2=4.325, df=1, p =0.037).

In addition to the quantitative analyses displayed above, GBA Plus of NSERC programs considered possible barriers for persons of all genders to access funding opportunities while considering the effect of various intersecting factors whenever possible. In this section, some of the most salient intersections for which significant impacts were identified are highlighted.

Early career researchers identifying as women received lower scores.

Analyses from different programs identified gender-related effects. This was observed in the first GBA Plus conducted for programs at NSERC for the Steacie Fellowships in 2018. This analysis found gendered language in program literature and criteria which posed barriers for nominations of early career researchers (ECRs). These findings, combined with the lower rate of nominations for women by certain institutions led to recommendations to remove gendered language from program literature and to modify restrictive criteria. Further, the GBA Plus for the DG program found that women who were ECRs were more likely to receive lower scores from the review committee, especially on the “Excellence of the Researcher” criterion, than men at a similar career stage. Strategies were proposed to identify and eliminate potential sources of unconscious bias such as reviewing the program literature to ensure inclusive language is used throughout all program literature components. For example, for program literature in French changes were made to ensure the use of inclusive language through the use of “doublets” to rename the criterion of “Excellence du chercheur” (Excellence of the researcher) to “Excellence de la chercheuse ou du chercheur” (Excellence of the woman or man researcher)[13]. In addition, for both the Steacie and the DG programs, it was suggested to review and reframe criteria such as "Excellence of the Researcher" or “Candidate’s stature in the scientific or

engineering community", in a way that more clearly outlines the specific attributes that are sought for the awards. This is in line with current research which notes that the notion of "excellence" is ill-defined and more pointed indicators of what "excellence" entails should be included while avoiding descriptions that may be biased, vague, or outdated (Jong et al. 2021, O'Connor et al. 2020). Accordingly, GBA Plus recommendations for adjustments to the "Excellence of the Researcher" criterion included eliminating potential gender-based biases and ensuring that it includes appropriate indicators of research excellence. For instance, studies have found that certain terms, such as "leadership", are often associated with masculine characteristics" (Koenig et al. 2011, Blake-Beard et al. 2020). According to Koenig et al. (2011), this may be due to role incongruency where "female stereotypes do not match expectations for leaders" and can impact women's ability to progress to leadership roles as well as their own self-identification as leaders. When taking this into consideration for the review process, the PDF program recommended that terms that are known to be more closely linked to masculine characteristics, including "leadership", should be replaced with indicators that are more inclusive and less vague[14]. Since the presentation of these recommendations, new training and guidance materials for reviewers, such as the Guidelines on the assessment of contributions to research, training and mentoring, have been developed by NSERC and are being implemented into programs.

Women's age was a significant factor predicting leaves and delays.

Women of all ages were found to be more likely than other applicants to include statements within the "special circumstances" section of applications or to report leaves and delays according to analyses for the DG and PDF programs correspondingly. For instance, the PDF program found that younger postdoctoral fellows identifying as women under the age of forty were more likely to report leaves and delays relating to family and care-related responsibilities, and women over the age of forty were more likely to have had non-linear career paths which negatively impacted traditional measures of research productivity. Further, the DG analysis showed that although women were found to be more likely to report leaves and delays on all years considered, women of all ages, along with persons with disabilities, saw a bigger increase than other groups in reported leaves and delays as a result of the COVID-19 pandemic. This impact of the pandemic was highlighted following the analyses of several programs (DG, Encouraging Vaccine Confidence in Canada, Brockhouse award, Polanyi award, Herzberg medal, and EIDM). Accordingly, and in consideration of these barriers experienced by women and persons with family and care responsibilities, recommendations regarding flexibility on eligibility criteria to programs and adjustments to selection criteria that focus on a broader range of contributions to research and achievements and better align with the recommendations included in the San Francisco Declaration on Research Assessment were proposed. In addition, since completion of these GBA Plus, other strategies have been implemented as well such as providing dedicated space in applications to explain delays in research and providing additional guidance for reviewers regarding the best ways to consider reported leaves and delays during assessment of applications.

Women's representation in natural sciences and engineering fields varies according to discipline.

A more nuanced look at data from the GBA Plus results reveals that representation of women in the NSE varies depending on intersecting factors beyond identity dimensions such as the specific disciplines being considered. According to the DG GBA Plus, representation of women is lowest in certain fields such as mathematics, statistics, physical sciences, engineering, and computer sciences. Discipline-specific differences were also noted in the Steacie program's analysis which identified an underrepresentation of women engineers in review committees and a lower award rate in 2018 for applicants who are engineers identifying as women.

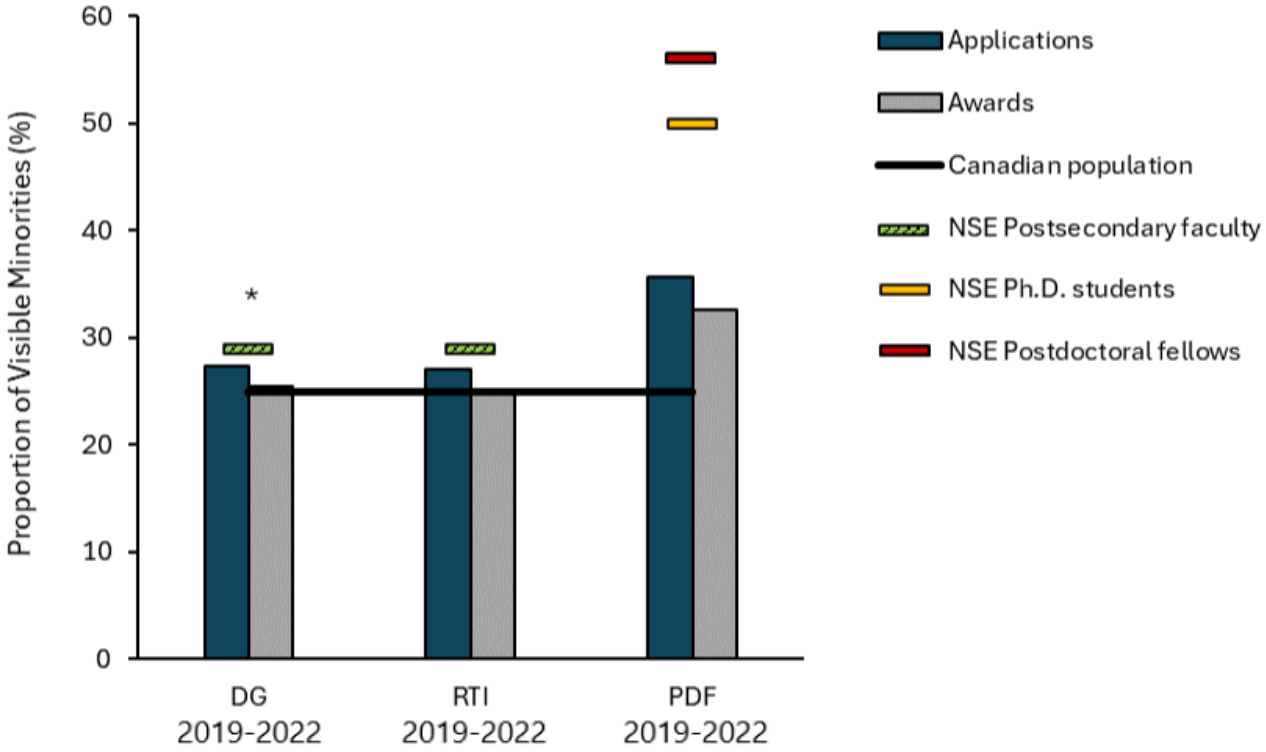
The analyses showed important effects of factors intersecting with gender such as age, career stage, and different NSE disciplines, particularly for mathematics, statistics, and engineering. This highlights the need to continue to gather data for monitoring purposes and to consider multiple intersecting factors to gain an accurate understanding of the representation of women in the NSE.

Visible minorities[6]/Racialized minorities[15]

Quantitative data from the 2019 – 2022 competitions for three funding opportunities (DG, RTI and PDF) showed that, in general, visible minorities are well represented when compared with the proportion (24.9%) of visible/racialized minorities over the age of 15 in the Canadian population (2021 Census). That being said, when compared against the populations within the NSE fields eligible to apply to programs, visible minorities are underrepresented[16] in applications and awards for NSERC programs (Figure 2).

In general, although award rates were lower than application rates for persons self-identifying as visible minorities for each program, no significant differences were found between application and award rates for the PDF (N=2206, X^2=3.571, df=1, p=0.058) and RTI (N=3096, X^2=2.624, df=1, p=0.105) funding opportunities. In contrast, in the DG program, the award rate for visible minorities was significantly lower than the application rate (N=10257, X^2=38.430, df=1, p <0.01; Figure 2).

Figure 2. Proportion of applications and awards for persons self-identifying as visible minorities for three NSERC programs



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Program	Applications (%)	Awards (%)	Canadian population (%)	NSE Postsecondary faculty (%)	NSE Ph.D. students (%)	NSE Postdoctoral fellows (%)
DG 2019-22	27.3	25.4	24.9	29	-	-
RTI 2019-22	27.1	25.0	24.9	29	-	-
PDF 2019-22	35.6	32.6	24.9	-	50	56

▼ Explanation of figure 2

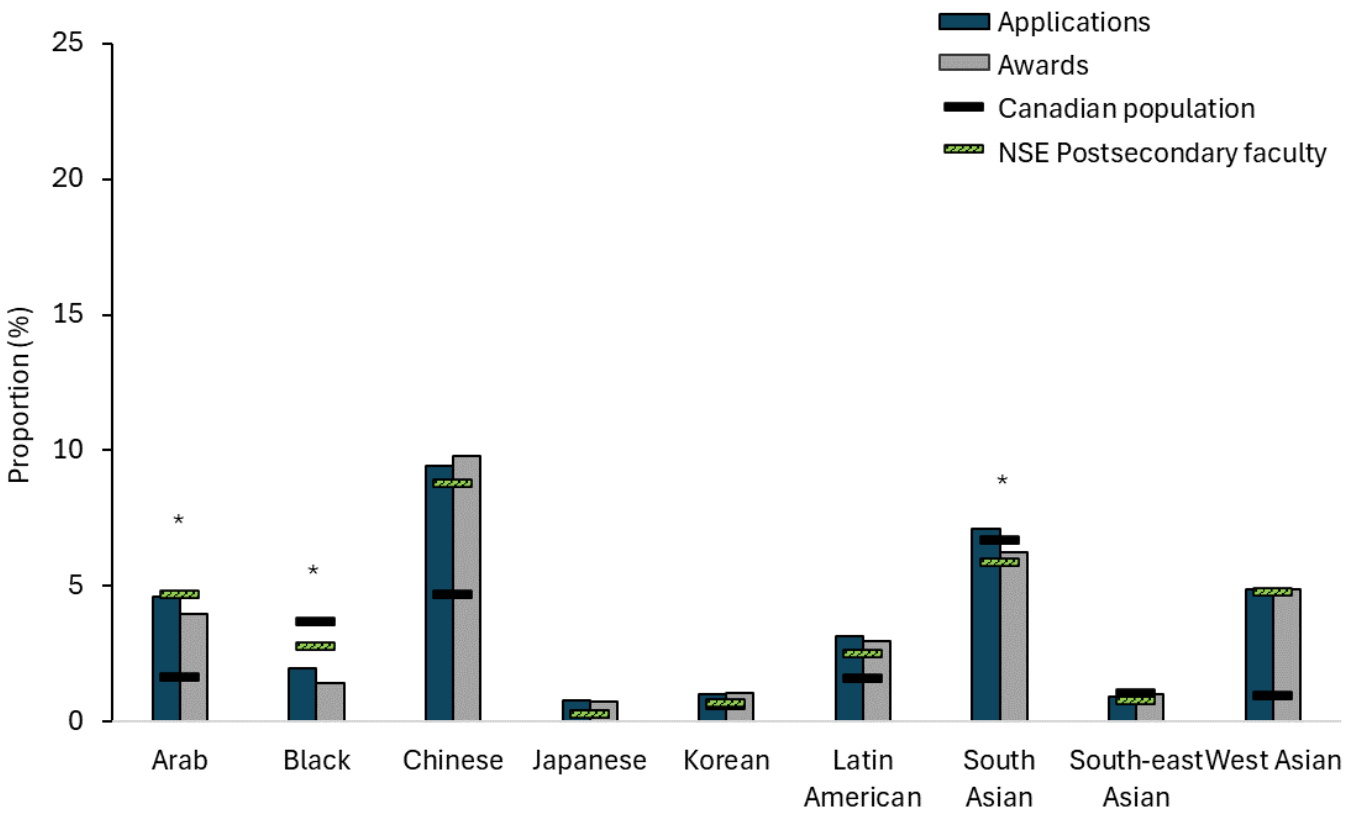
Figure 2. Proportion (%) of persons self-identifying as visible minorities in applications (blue) and awards (grey) for three NSERC programs (Discovery Grants (DG), Research Tools and Instruments (RTI), and Postdoctoral Fellowships (PDF); Program competition data) as compared to the corresponding proportion of visible minorities in the Canadian population (solid black line; Statistics Canada 2021) and the populations eligible to apply to each program (SPFR 2019): NSE Postsecondary faculty for the DG and RTI programs (striped green lines); NSE Ph.D. students (yellow line) and NSE

Postdoctoral fellows (red line) for the PDF program. Asterisk (*) represents statistically significant differences between application rates and award rates (P<0.01). Award rates were found to be significantly lower than application rates for persons identifying as visible minorities for the Discovery Grants program.

Despite these results, it is important to note that visible/racialized minorities are not a homogenous grouping and considering the data for all population groups commonly included within this category can fail at identifying more detailed patterns and the different experiences and barriers faced by separate population groups. Accordingly, NSERC GBA Plus recognizes these important differences and takes a more nuanced look at the different population subgroups of visible/racialized minorities wherever possible.

When considering specific population subgroups, data from the 2022 competition results for the DG program shows that the proportions of applicants and awardees who self-identify as Black are below the proportion of persons from these groups in the larger Canadian population over the age of fifteen (Statistics Canada 2021 Census). Further, Black applicants and awardees are also underrepresented when compared to the proportion of eligible Black NSE researchers (Figure 2b).

Figure 2b. Proportion of applications and awards for persons self-identifying as members of nine population subgroups in the 2022 DG competition.



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Population subgroup	Applications (%)	Awards (%)	Canadian population (%)	NSE Postsecondary faculty (%)
Arab	4.6	3.9	1.65	4.7
Black	1.9	1.4	3.7	2.8
Chinese	9.4	9.8	4.7	8.8
Japanese	0.8	0.8	0.3	0.3

Population subgroup	Applications (%)	Awards (%)	Canadian population (%)	NSE Postsecondary faculty (%)
Korean	1.0	1.0	0.6	0.7
Latin American	3.1	2.9	1.6	2.5
South Asian	7.1	6.2	6.7	5.9
South-east Asian	0.9	1.0	1.0	0.8
West Asian	4.9	4.9	1.0	4.8

▼ Explanation of figure 2b

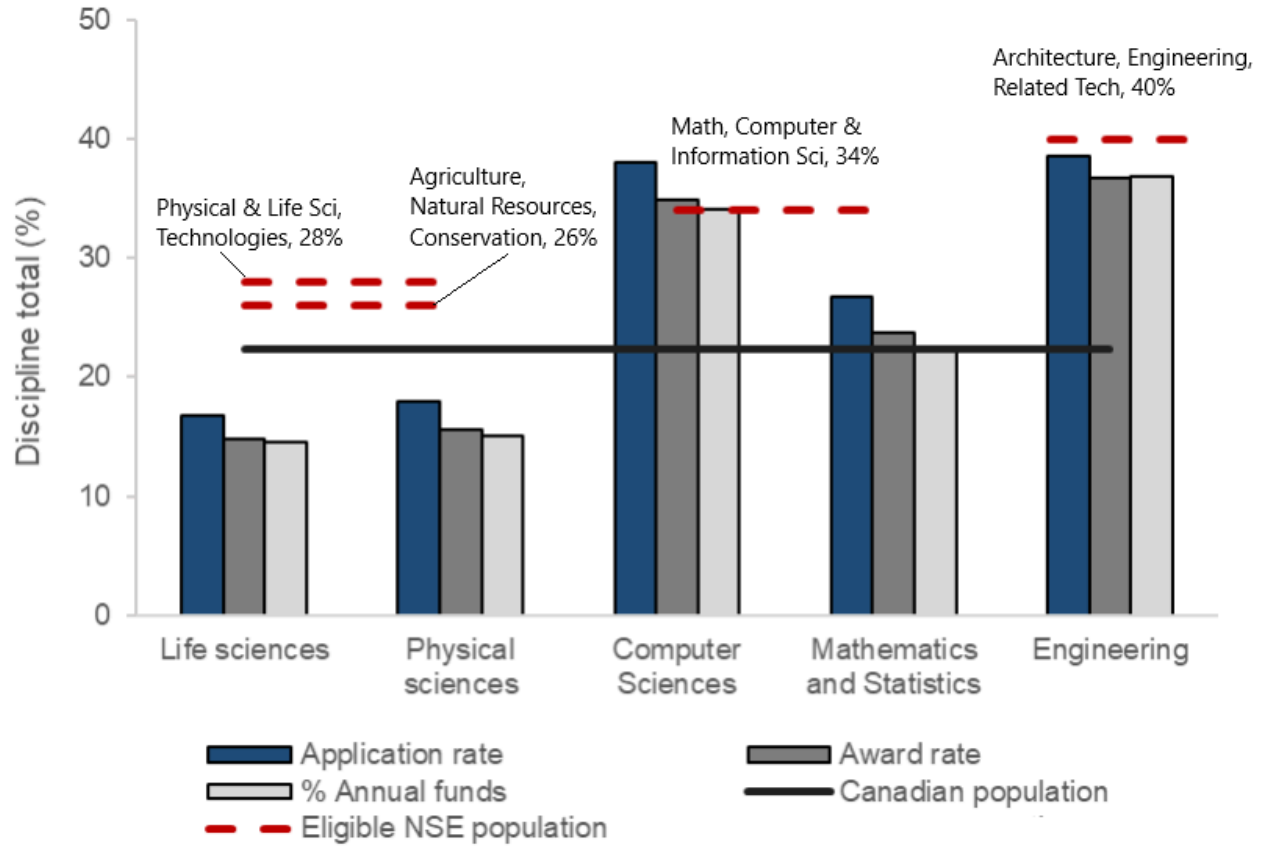
Proportion (%) of persons who self-identify as belonging to each of 9 different minority subgroups that applied to (blue) and were awarded (grey) by NSERC's Discovery Grants program in 2022 in contrast to the proportion of the Canadian population (black lines; Statistics Canada 2021 Census) and the proportion of university faculty and researchers (striped green lines; SPFR 2019) who self-identify as belonging to each of these 9 population subgroups. Asterisks (*) in the figure represent statistically significant differences between application rates and award rates ($P<0.05$). Award rates were found to be significantly lower than application rates for persons identifying as Arab, Black and South Asian.

APRs and AWRs were contrasted in this analysis for each population group and significant differences were found for persons self-identifying as Arab, Black, and South Asian. The data suggests that these groups are less likely to be awarded after applying. Possible barriers that impact these groups' success rates in competitions will need to be investigated and addressed.

Representation of visible/racialized minority groups varies according to disciplines.

DG program's GBA Plus showed that the proportion of persons identifying as visible minorities applying to and being awarded by the program varied according to the NSE disciplines considered (Figure 2c). Persons identifying as visible minorities were underrepresented in the physical sciences, mathematics and statistics and in the life sciences when compared to eligible population of NSE postsecondary faculty.

Figure 2c: Proportion of applications, awards and percent annual funds awarded to persons self-identifying as visible minorities in five DG discipline groupings.



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DG discipline grouping	Applications (%)	Awards (%)	% Annual funds	Canadian population (%)	NSE postsecondary faculty (% by discipline group)			
					Physical and life sciences and technologies	Agriculture, natural resources and conservation	Math, computer and information sciences	Architecture, engineering, related tech.
Life sciences	16.8	14.8	14.5	22.3	28	26	-	-
Physical sciences	17.9	15.6	15	22.3	28	26	-	-
Computer sciences	38.1	34.9	34.1	22.3	-	-	34	-
Mathematics and statistics	26.8	23.7	22.4	22.3	-	-	34	-
Engineering	38.5	36.7	36.8	22.3	-	-	-	40

▼ Explanation of figure 2c

Application rates (blue), award rates (grey) and percent annual funds awarded (white) to persons self-identifying as visible minorities according to five DG discipline groupings (life sciences, physical sciences, computer sciences, mathematics and statistics, and engineering) for the DG program (2019 – 2021 competition data) as compared to the

Canadian population (black line; Statistics Canada 2017) and the population of NSE postsecondary faculty in Canada for four corresponding discipline groupings in the 2019 SPFR (red dashed lines): physical and life sciences and technologies; agriculture, natural resources and conservation; math, computer and information sciences; and architecture, engineering and related tech.

Further, when compared against the proportion of visible minorities in the larger Canadian population (22.3%), the available data shows that persons who self-identify as members of visible minority groups are also underrepresented in the Life Sciences and in the Physical Sciences.

Success rates for visible minorities are negatively correlated with age and citizenship status.

In general, the DG GBA Plus found that applicants identifying as visible minorities received lower scores in all selection criteria during the review process. Similarly, according to the PDF program's GBA Plus, data showed that persons identifying as visible minorities over forty years of age had a lower success rate than persons of the same age not identifying as visible minorities, thus suggesting an effect of the intersecting factors of age and self-identification as a visible minority. Further, for the PDF program, persons identifying as visible minorities who were not Canadian citizens at the time of applying also had lower success rates. Although the reasons for these observed differences related to immigration status are not clear, results from a survey of applicants to the DG program conducted between 2012 and 2017 highlighted possible impacts of possibly related factors including language-related barriers and barriers encountered by newcomers to Canada.

The findings of the GBA Plus work led to recommendations to modify various elements related to the application and review processes of NSERC programs. Specifically, some recommendations included changes to selection criteria to ensure the inclusion of appropriate indicators of excellence, additional guidance for reviewers on unconscious bias and fair assessment of research contributions, and increasing awareness within the research community of the observed patterns of underrepresentation and barriers for certain groups. These changes may positively impact participation rates of visible minorities as well as other equity-deserving and rights-holding groups in programs since the recommended changes to the selection criteria include a wider range of academic accomplishments which better reflect excellence in research without emphasizing traditional markers used in peer review. Traditional markers, based for example on number of publications and previous awards, tend to favour certain groups of applicants such as those who have followed a linear career path, and those who have been in Canada for longer, while failing to recognize other types of valuable achievements such as mentoring, participation in science communication/promotion, achievements in education, contributions to research made abroad, among others. De-emphasizing the markers traditionally used in peer review, including the focus on quantitative measures of achievements, and shifting towards the recognition of a broader variety of academic accomplishments allows for a fair evaluation and is in line with recommendations outlined in the San Francisco Declaration for Research Assessment (DORA). These recommendations are being integrated into several programs at NSERC. Further, additional initiatives have been launched to support researchers from visible minority groups and increase their representation, such as the Black Scholars' initiative which allocates additional funding to support Black students and researchers.

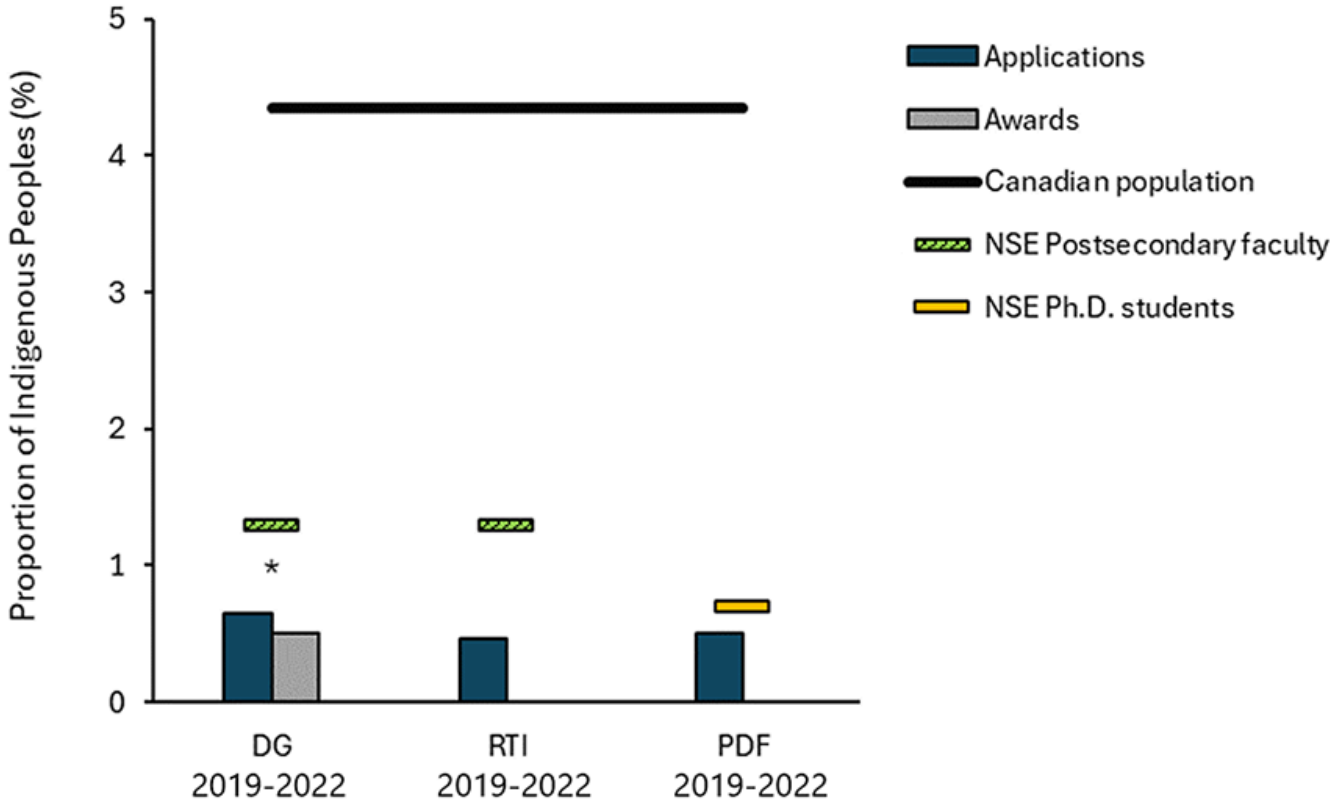
Indigenous Peoples

Competition results showed an underrepresentation of Indigenous applicants in NSERC's funding opportunities. The proportion of Indigenous researchers applying to and receiving funds from the DG, RTI and PDF programs are lower than the proportion of researchers identifying as Indigenous in the NSE faculty population eligible to apply to the DG program (1.3%) and well below the proportion of persons self-identifying as Indigenous in the Canadian population over the age of 15 (4.3%) (2021 Census; Figure 3) and in the Canadian labour force (4.0%). Further, the DG program also revealed statistically significant differences between the application and award rates for Indigenous researchers (N=10556, X^2= 6.846, df=1, p=0.008). Note that due to small numbers[17], the awardee data for the PDF and the RTI programs cannot be presented.

Lack of representation led to unavailability of sufficient data for further analyses.

Despite the necessary data omissions[18] and the inability to draw meaningful conclusions from intersectional analyses due to limited data availability, these issues themselves show a serious underrepresentation of Indigenous researchers in NSERC funding opportunities and in the NSE postsecondary system, highlighting the importance of identifying and eliminating barriers for Indigenous participation in research.

Figure 3. Proportion of applications and awards for persons self-identifying as Indigenous for three NSERC programs.



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Program	Applications (%)	Awards (%)	Canadian population (%)	NSE Postsecondary faculty (%)	NSE Ph.D. students (%)	NSE Postdoctoral fellows (%)
DG 2019-22	0.65	0.5	4.35	1.3	-	-
RTI 2019-22	0.47	-	4.35	1.3	-	-
PDF 2019-22	0.5	-	4.35	-	0.7	-

▼ Explanation of figure 3

Proportion (%) of Indigenous Peoples applying (blue) and being awarded (grey) in three NSERC programs (Discovery Grants (DG), Research Tools and Instruments (RTI), and Postdoctoral Fellowships (PDF); Competition data from 2019 – 2022) as compared to the corresponding proportion of Indigenous Peoples in the Canadian population (solid black line; Statistics Canada 2021 Census) and the populations eligible to apply to each program (SPFR 2019): NSE Postsecondary faculty for the DG and RTI programs (striped green lines); NSE Ph.D. students (yellow line) for the PDF program. Note that some data have been redacted due to small numbers. Asterisk (*) in figure represents statistically significant differences between application rates and award rates ($P<0.05$). Award rates were significantly lower than application rates for persons identifying as Indigenous in the DG program.

NSERC's programs' GBA Plus explored the possible barriers for Indigenous applicants. These analyses identified concerns related to policies which may be too restrictive, limiting eligibility of Indigenous community partners and collaborators, and to a lack of representation in academia of persons self-identifying as Indigenous in faculty positions. In response to these concerns, programs recommended added flexibility and expansion of certain policies regarding program requirements and eligibility criteria. These changes could also facilitate collaboration with Indigenous communities and with Indigenous researchers outside of the NSE for multidisciplinary research and provide more opportunities for outreach, knowledge transfer, co-production of knowledge, and Indigenous-led research.

Some programs also highlighted the need to consider barriers that applicants may be experiencing earlier on in their academic career. For instance, the results of the GBA Plus for the RTI program highlighted the low representation of persons self-identifying as Indigenous among the group of researchers who are eligible to apply to the RTI program[19]. Considering that applicants to the RTI program must hold a NSERC award in order to apply, it was noted that barriers researchers face earlier on, such as experienced in other programs or in their overall career progression, may be having an impact on their representation in the RTI pool of eligible applicants. Although NSERC has limited influence on possible barriers at individual institutions or in academia in general, one strategy proposed was to promote other existing NSERC programs to equity-deserving and rights-holder groups, including Indigenous researchers, to incentivize increased participation of these groups as younger researchers progress in their academic careers. On this, it is important to highlight that although there is still work to be done to support longer term career trajectories for Indigenous researchers, there are efforts at NSERC which already promote participation of equity-deserving and rights-holding groups in programs from early career stages. Notably, the USRA program, the Canada Graduate Scholarships – Masters program, the Canada Graduate Scholarships – Doctoral program, and the Postgraduate Scholarship – Doctoral program supports participation of Indigenous researchers by allowing institutions to submit applications from Indigenous students above the institution's quota.

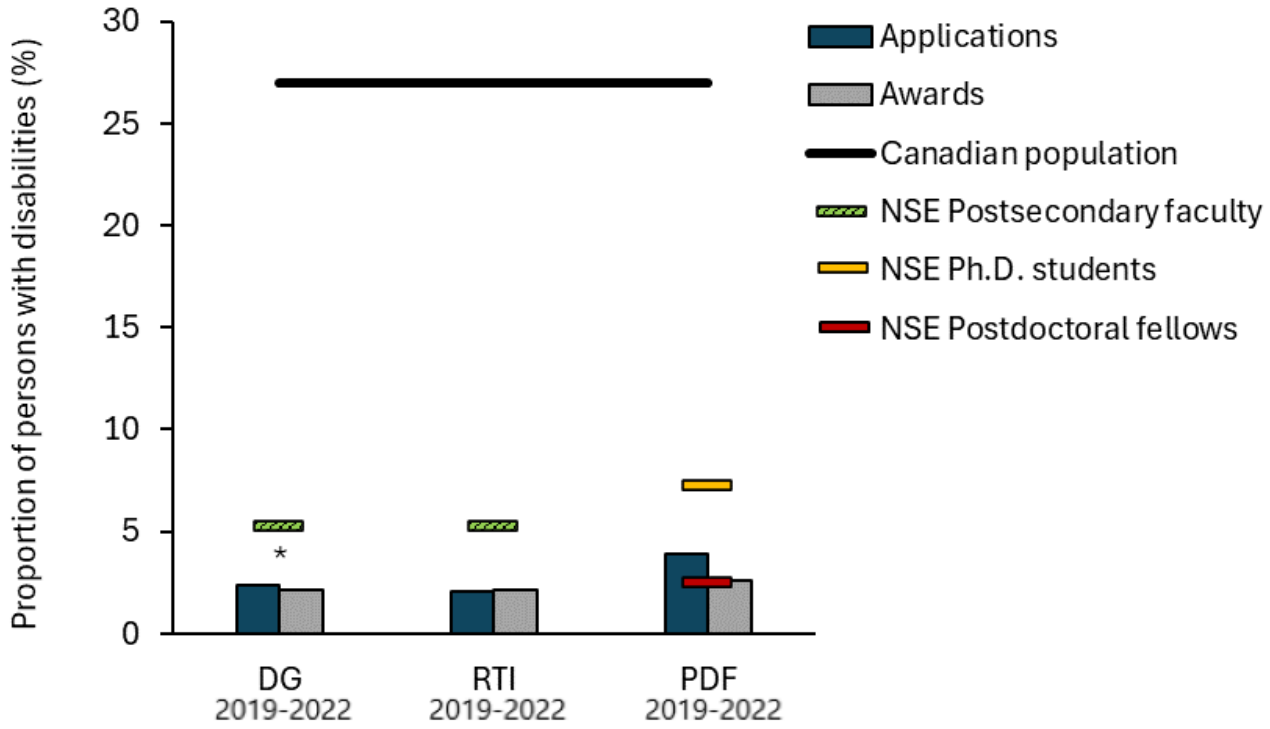
It is important to note that Indigenous applicants may also be impacted by intersecting factors such as institution region and size and socioeconomic status among other factors. These factors will be investigated further as more data become available in order to identify barriers to participation and possible solutions.

Further, in parallel to GBA Plus analysis of programs, several efforts to support Indigenous research and researchers at NSERC are currently being co-developed with Indigenous leaders as per the strategic plan for the Strengthening Indigenous Research Capacity initiative: Setting new directions to support Indigenous research and research training in Canada. The work towards the implementation of this strategic plan is ongoing and as indicated in the Canada Research Coordinating Committee's Progress Report, Vision to Action: 2018-23 (2023), Canada's funding agencies have already advanced foundational work for the implementation of the plan through the formation of the Tri-agency Indigenous Funding Opportunities Working Group, the Tri-agency Working Group Focused on Administrative Barriers to Indigenous Community-led Research, the Reference Group for the Appropriate Review of Indigenous Research, and the Indigenous Leadership Circle in Research.

Persons with disabilities

NSERC's funding opportunities' GBA Plus also considered data regarding persons with disabilities and their participation in NSERC programs. Competition data showed that NSERC programs' application and award rates for persons with disabilities are lower than the proportion of persons with disabilities in the larger Canadian population (27%) (Figure 4). Compared with the proportion of the Canadian population who identifies as having a disability in the labour force (9.1%) and the eligible NSE faculty population for this group (5.3%), persons with disabilities were underrepresented in the DG and RTI programs (Census 2016, SPFR 2019). In the case of the PDF program, the proportions of applicants (3.9%) and awardees (2.6%) self-identifying as person with disabilities were higher than or similar to the proportion of persons with disabilities in postdoctoral positions in Canada (2.5%), but these proportions were smaller than the proportion of persons with disabilities in PhD programs (7.3%) (Figure 4).

Figure 4. Proportion of applications and awards for persons with disabilities for three NSERC programs.



▼ Text description of figure 4

Program	Applications (%)	Awards (%)	Canadian population (%)	NSE Postsecondary faculty (%)	NSE Ph.D. students (%)	NSE Postdoctoral fellows (%)
DG 2019-22	2.4	2.2	27	5.3	-	-
RTI 2019-22	2.0	2.1	27	5.3	-	-
PDF 2019-22	3.9	2.6	27	-	7.3	2.5

▼ Explanation of figure 4

Proportion (%) of persons with disabilities applying (blue) and being awarded (grey) in three NSERC programs (Discovery Grants (DG), Research Tools and Instruments (RTI), and Postdoctoral Fellowships (RTI); Competition data from 2019 – 2022) as compared to the corresponding proportion of persons with disabilities over the age of 15 in the Canadian population (solid black line; Statistics Canada 2021 Census) and the populations eligible to apply to each program (SPFR 2019): NSE Postsecondary faculty for the DG and RTI programs (striped green lines); NSE Ph.D. students (yellow line) and NSE Postdoctoral fellows (red line) for the PDF program. Asterisk (*) in figure represents statistically significant differences between application rates and award rates ($P<0.05$). Award rates were significantly lower than application rates for persons with disabilities in the DG program.

When considering the application and award rates for each program, the difference between APR and AWR was also not statistically significant for the RTI (N=3164, X^2=0.0006, df=1, p=0.980) program. In the case of the PDF program, award rates were lower than application rates for persons with disabilities in the PDF program but the difference did not reach statistical significance (N=2239, X^2=3.024, df=1, p=0.08). In contrast, in the DG program the award rate (2.2%) was significantly lower than the application rate (2.4%) (N=10383, X^2=3.884, df=1, p=0.048).

Further, despite the observed underrepresentation, some programs reported an increase in the number of applicants who self-identified as persons with disabilities between 2019 and 2021. Nevertheless, data remains very limited, and this impeded the ability to draw meaningful conclusions.

Accessibility concerns regarding program literature.

Some NSERC programs' GBA Plus identified issues with program literature posted on NSERC's website. For instance, the RTI program identified that information on options for persons who are deaf or hard of hearing to contact NSERC was missing from application instructions or the links were broken. Further, the RTI and Encouraging Vaccine Confidence in Canada GBA Plus recommended reviewing program literature text for plain language accessibility in English and in French to increase accessibility for persons with certain disabilities which impact vision and reading abilities. Overall GBA Plus recommendations advocated for clearer and more accessible information which could include the use of plain language, closed captioning on guidance videos for applicants, and additional options for communication with NSERC staff. It is important to note that since the completion of these analyses, NSERC has developed and published the NSERC Accessibility Plan which aims to remove and prevent barriers to accessing NSERC's funding. Efforts across the council are ongoing to address these issues.

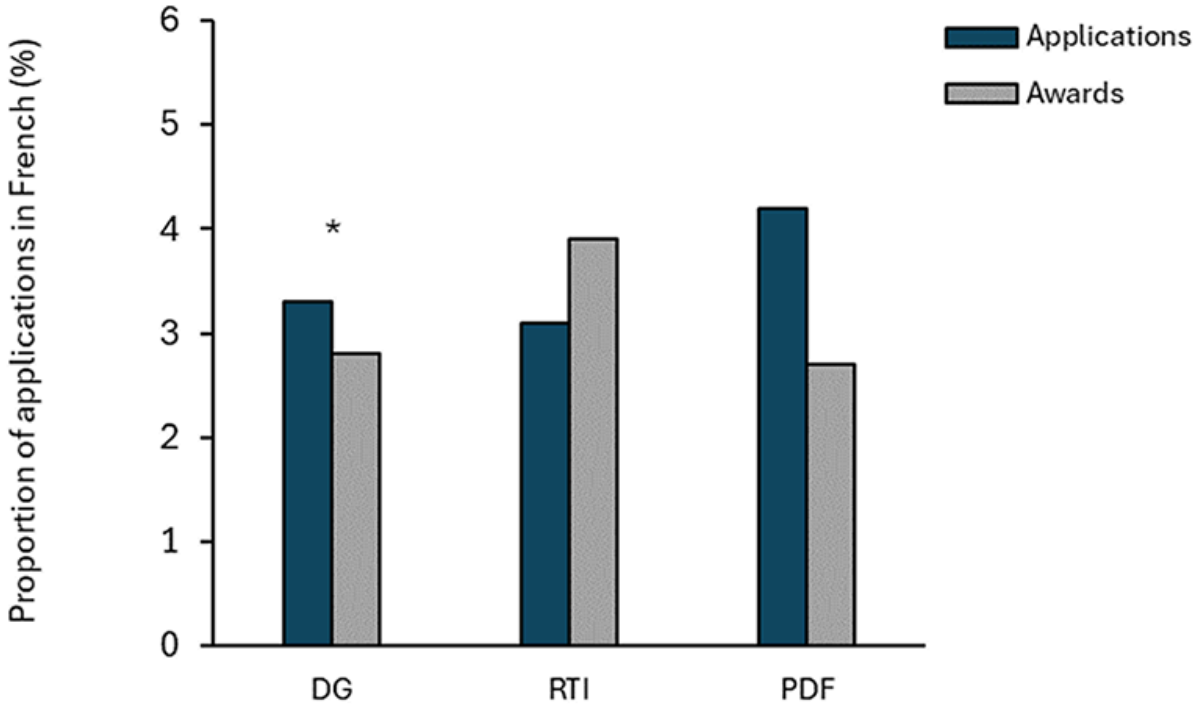
Persons with disabilities are more likely to report leaves and delays.

In addition to accessibility concerns it is also important to highlight that persons with disabilities are more likely to experience delays and to require leaves than applicants without a disability. In the case of persons with disabilities, this may lead to ableist biases when assessing the excellence of the researcher criterion, specifically around the construct of research "productivity." This was of particular importance during the COVID-19 pandemic when programs reported an increase on leaves and delays for all applicants. While the number of delays reported nearly doubled for all applicants, delays heavily impacted groups that had a higher number of delays before the pandemic such as researchers identifying as women and persons with disabilities. For example, the DG GBA Plus noted that the proportion of persons with disabilities reporting delays increased from 28% in pre-pandemic years to 49% in 2021. As a result of these findings, some programs including DG recommended improving guidance on appropriate consideration of leaves and delays in the review of applications. Further, recommendations were also made to reconsider the methods used to collect information on applicants' leaves and delays. For instance, following the Steacie program's GBA Plus, it was noted that space to report leaves and delays was only available in nomination letters and no space was provided for nominees to elaborate. Changes to the program were recommended to provide space and opportunity for nominees to elaborate on leaves and delays themselves. Similar recommendations were also made for the DG program which proposed making the process for applicants to report leaves and delays clearer and more efficient, while improving the mechanism to extend the 6-year window for contributions to research and training, making it more intuitive and simpler for persons with eligible delays.

Francophone populations and French-language applications

An important consideration for all NSERC programs is the use of both of Canada's official languages and equal access to funding for Anglophone and Francophone applicants. Therefore, all funding opportunities' GBA plus considered the use of Canada's official languages. Overall, the proportion of applications submitted in French was below 4.5% for all programs under investigation for which data was available. When considering the APRs and AWRs for French submissions (Figure 5), a statistically significant difference was found for the DG program,(N=8784, X^2 =172.87, df=1, p<0.001), but not for the PDF program, (N=2140, X^2 =1.948, df=1, p=0.162). Further, meaningful statistical analysis was not possible for the RTI programs due to the small number of French applications.

Figure 5. Proportion of applications and awards for applications submitted in French for three NSERC programs.



▼ Text description of figure 5

Program	Applications (%)	Awards (%)
DG 2019-22	3.3	2.8
RTI 2019-22	3.1	3.9
PDF 2019-22	4.2	2.7

▼ Explanation of figure 5

Proportion (%) of applications in French that were submitted (blue) and awarded (grey) in three NSERC programs (Discovery Grants (DG), Research Tools and Instruments (RTI), and Postdoctoral Fellowships (PDF); Competition data from 2019 – 2022). Asterisk (*) in figure represents statistically significant differences between application rates and award rates (P<0.05). Award rates were significantly lower than application rates for French applications in the DG program.

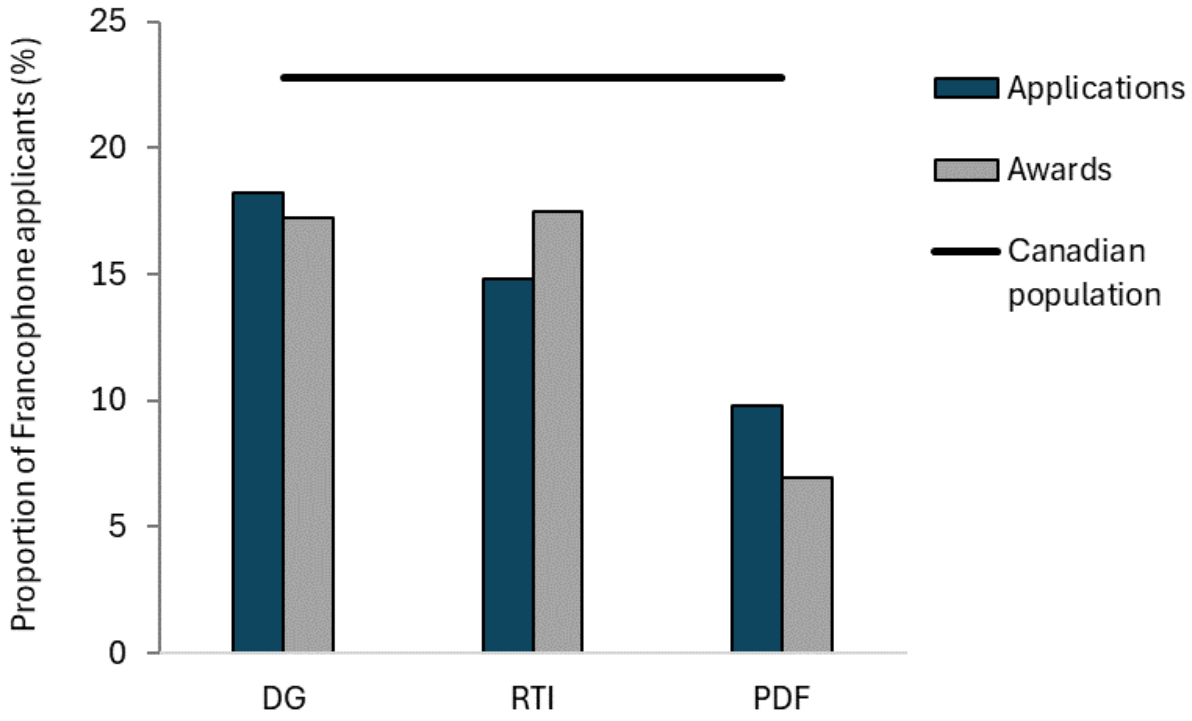
Instead of considering the language of application as a proxy of participation of Anglophone and Francophone researchers, other programs used the researchers' indicated language of preference. Notably, the Steacie program considered the nominees' official language of preference in their analysis. Their findings also show low numbers of nominees' whose preferred official language is indicated to be French, but due to the low data availability no meaningful statistical analysis was possible.

There is a preference to submit applications in English despite applicants' language background.

The proportion of French applications submitted to NSERC's programs is well below the Canadian population for whom French is their first official language[20] (22.8%). However, data on applicants' first language and home language were not available until after the launch of a new self-identification questionnaire in 2021, and evidence from analyses of NSERC programs shows that the proportion of applications who submitted their application in French is not an accurate measure of the proportion of

Francophone applicants[21]. For instance, while the proportion of applications submitted in French falls below 5% for the DG, RTI and PDF programs (Figure 5), an analysis considering the latest available 2022 data for DG, RTI and PDF programs shows that applications from Francophone populations are higher than this might indicate (Figure 5b).

Figure 5b. Proportion of applications and awards for Francophone persons for three NSERC programs.



▼ Text description of figure 5b

Program	Applications (%)	Awards (%)	Canadian population (%)
DG 2019-22	18.2	17.2	22.8
RTI 2019-22	14.8	17.5	22.8
PDF 2019-22	9.8	6.9	22.8

▼ Explanation of figure 5b

Proportion (%) of applications (blue) and awards (grey) from Francophone persons for three NSERC programs (Discovery Grants (DG), Research Tools and Instruments (RTI), and Postdoctoral Fellowships (PDF); 2022 Competition data) as compared to the corresponding proportion of Francophone persons in the Canadian population (solid black line; Statistics Canada 2021 Census).

When considering the application and award rates for Francophone[18] applicants, the results still show an underrepresentation of this group when compared to the Francophone population in Canada. Further, award rates were lower than application rates for Francophone applicants in the DG (N=2298, X^2=2.848, df=1, p=0.091) and PDF (N=614, X^2=1.706, p=0.191) programs. In contrast, for the RTI (N=642, X^2=1.506, df=1, p=0.219) program, award rates were higher than application rates. However, in all cases the differences were not statistically significant.

Further, a preliminary analysis of the DG Program's 2022 self-identification data revealed that the majority (82%) of Francophone applicants submitted their applications in English and that more than half of Francophone applicants (56.1%) selected their preferred language of communication to be English. For Francophone applicants who indicated that their preferred language of correspondence was French, 28.7% still submitted their application in English. Overall, these numbers indicate that a large proportion of Francophone applicants opt for submitting their applications in English regardless of their first language or preferred language of communication. This is in line with the results of the PDF GBA Plus which indicated that while in 2022 only 2.3% of applications were submitted in French, 8% of applicants indicated speaking French as their first language. These results highlight the need for future analyses to consider language data more carefully to gauge the participation of Francophone applicants accurately. In addition, the preference to submit applications in English should be explored further.

Applications submitted in French by early career researchers were less likely to be successful.

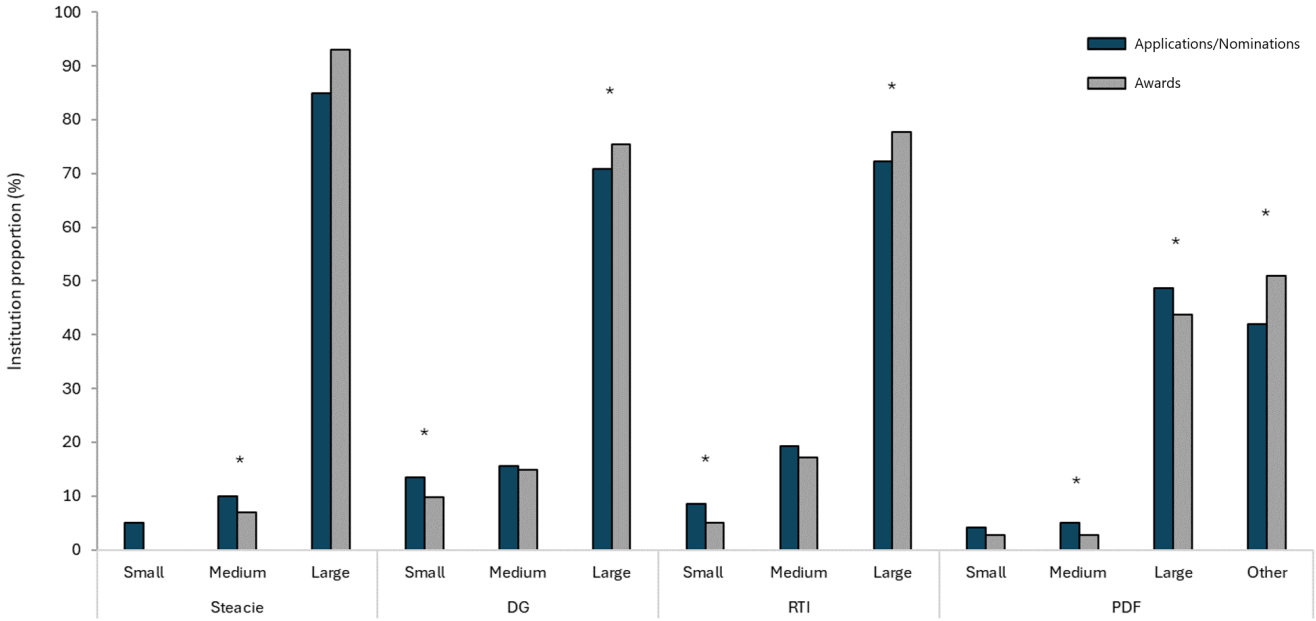
Results from the DG program's GBA Plus showed that applications submitted in French were less likely to be awarded compared to those submitted in English, and when awarded, received a lower funding amount. Further analysis showed that this effect seemed to be driven primarily by the intersecting factor of career stage, where applications submitted in French by ECRs were more likely to be rated lower on all selection criteria and thus were less likely to be awarded.

In response to results from these analyses, some items for improvement to application materials and the review process were identified to remove potential barriers for Francophone applicants and applications submitted in French. For instance, a number of programs' GBA Plus identified a need for additional space in applications submitted in French to accommodate for language-specific differences. However, the low number of applications submitted in French seems to be part of a larger issue within the international research ecosystem due to the hegemony of English for science communication and dissemination of research. For example, the majority of research journals, especially the most well-known research journals are in English, providing very few options to publish and widely disseminate research in French journals or in French [ACFAS 2021]. The issues regarding preference to publish and submit applications in English thus requires further investigation and monitoring, including additional data collection and increased collaboration with stakeholders, to continue to work to support Francophone research and researchers in Canada.

Institution size and region

Another factor that was considered in NSERC funding opportunities' GBA Plus was institution size (Figure 6). The quantitative comparisons of application and award rates for programs according to institution size showed some areas for improvement. For example, from 2019 – 2021 the proportion of awards given to small institutions was found to be significantly lower than the proportion of applications received from small institutions for the DG (N=8784, X^2 =61.04, df=1, p<0.001) and RTI (N=2708, X^2 =10.157, df=1, p=0.001) programs. In contrast, the opposite pattern can be seen for large institutions, where the proportion of awards received is significantly higher than the proportion of applications submitted by these institutions to the DG (N=8784, X^2 =54.16, df=1, p<0.001) and RTI (N=2708, X^2 =9.811, df=1, p=0.001) programs. It is important to note that this pattern is also observed in the case of the Steacie program, but it did not reach statistical significance. This, however, could be due to small numbers in the data. In the case of the PDF program, a different pattern emerges where medium and large institutions receive a smaller proportion of awards than would be expected according to the proportion of applications submitted. However, the results for this program are more difficult to interpret for a variety of factors. Specifically, for the PDF program the institution associated with an individual researcher represents the institution where the awardee holds the award rather than the institution with which they were associated at the time of submission of their application. This is in contrast with data from other programs where the institution associated with the researcher represents the researcher's affiliation at the time of application.For this reason, a large proportion of applications and awards for the PDF program are associated with institutions that are categorized differently and can include foreign institutions or research institutes. This also presents a challenge when associating PDF awards with one specific institution.

Figure 6. Proportion of applications/nominations and awards for four NSERC programs according to institution size



▼ Text description of figure 6

Program	Institution size	Applications/Nominations (%)	Awards (%)
Steacie 2009-18	Small	5	-
	Medium	10	7
	Large	85	93
DG 2019-22	Small	13.5	9.7
	Medium	15.6	14.9
	Large	72.2	75.4
RTI 2019-22	Small	8.5	5.0
	Medium	19.2	17.2
	Large	72.2	77.7
PDF 2019-22	Small	4.1	2.8
	Medium	5.1	2.7
	Large	48.8	43.8
	Other	42.0	51

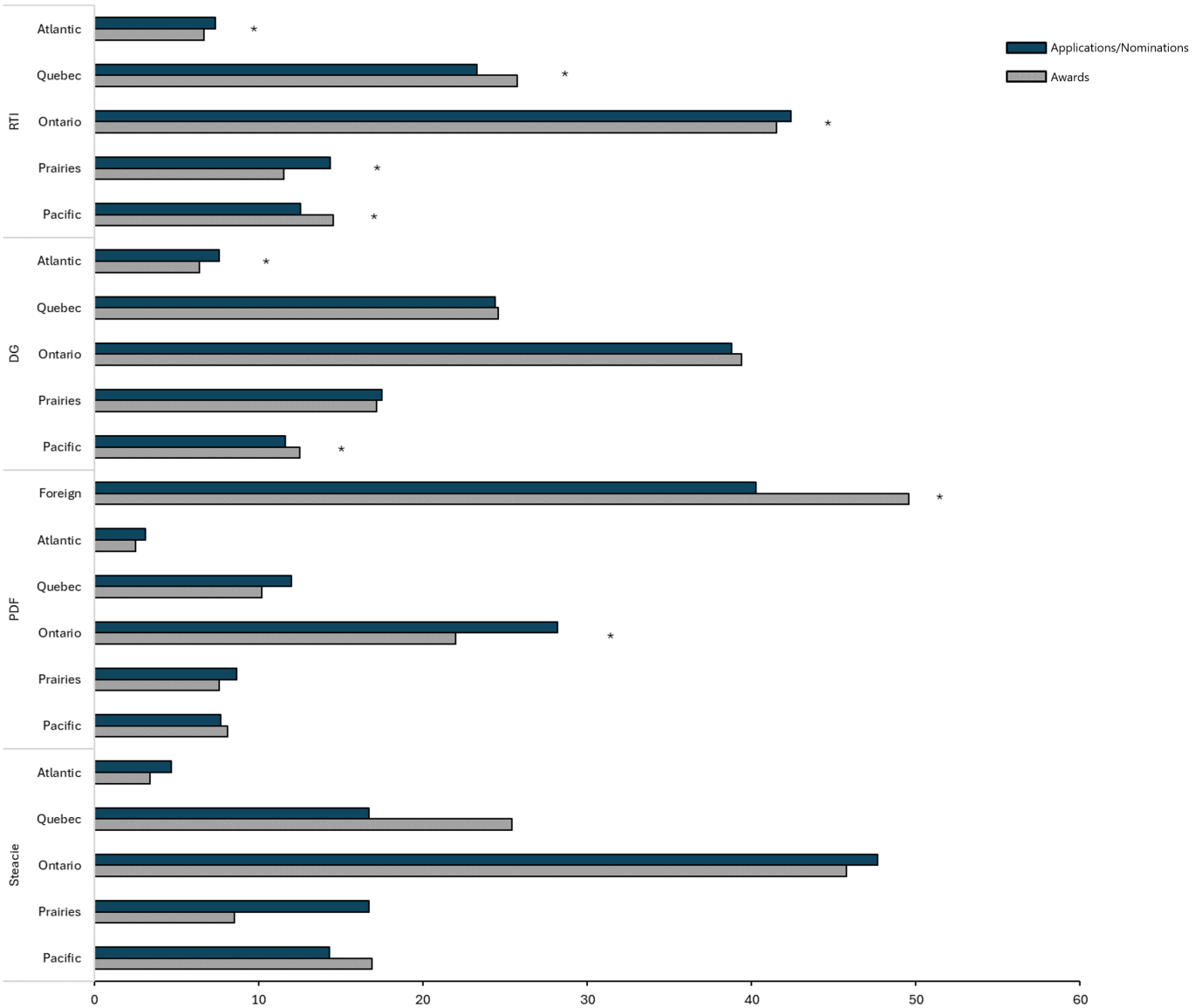
▼ Explanation of figure 6

Proportion (%) of applications/nominations (blue) and awards (grey) received from and awarded to applicants at small, medium and large institutions for four NSERC funding opportunities (Steacie Fellowships, Discovery Grants (DG), Research Tools and Instruments (RTI), and Postdoctoral Fellowships (PDF); Data from the 2019 – 2022 competition years for DG, RTI and PDF programs, and data from the 2009 – 2018 competition years for the Steacie Fellowships program). Asterisks (*) in figure represent statistically significant differences between application rates and award rates ($P<0.05$). Award rates were found to be significantly lower than application rates for small institutions in the DG and RTI programs, medium institutions in the Steacie Fellowships program, and medium and large institutions in the PDF program. Award rates were found to be significantly higher than application rates for large institutions in the DG and RTI programs and for the “other” category of institution size in the PDF program.

Following quantitative analysis, the DG and RTI funding opportunities highlighted possible barriers for smaller institutions and smaller teams seeking funding, including unintentional biases in traditional selection criteria. For instance, the large volume of program literature that needs to be reviewed and the materials that need to be prepared for applications can present a barrier for applicants from institutions with limited resources for researchers. In addition, many small institutions have no graduate programs or very small ones which may affect their capacity to demonstrate their contributions to the training of HQP, which is a selection criterion assessed in the DG program.In response to these observations, recommendations were made to adjust the application process by increasing clarity and reducing the volume of literature and application materials needed. Recommendations were also made to provide additional guidance regarding assessment of applications to ensure reviewers assess the quality and impact of training for HQPs, rather than the number or level of trainees. It is also important to note that NSERC further supports research at small institutions through the Discovery Development Grants (DDG) program, a program complementary to DG, which aims to provide resources to researchers at small institutions to support their research programs.

Institutions' regions were also considered in the funding opportunities' GBA Plus (Figure 6b).

Figure 6b. Proportion of applications/nominations and awards for four NSERC programs according to institution region



▼ Text description of figure 6b

Program	Institution region	Applications/Nominations (%)	Awards (%)
Steacie 2009-18	Atlantic	4.7	3.4
	Quebec	16.7	25.4
	Ontario	47.7	45.8
	Prairies	16.7	8.5
	Pacific	14.3	16.9
DG 2019-22	Atlantic	7.6	6.4
	Quebec	24.4	24.6
	Ontario	38.8	39.4
	Prairies	17.5	17.2
	Pacific	11.6	12.5
RTI 2019-22	Atlantic	7.38	6.7
	Quebec	23.3	25.8
	Ontario	42.4	41.5
	Prairies	14.4	11.5
	Pacific	12.6	14.5
PDF 2019-22	Atlantic	3.12	2.5
	Quebec	12	10.2
	Ontario	28.2	22
	Prairies	8.65	7.6
	Pacific	7.7	8.1
	Foreign	40.3	49.6

▼ Explanation of figure 6b

Proportion (%) of applications/nominations (grey) and awards (blue) received from and awarded to applicants at institutions in five different regions of Canada and internationally (Atlantic, Quebec, Ontario, Prairies, Pacific, and Foreign) for four NSERC programs (Steacie Fellowships, Discovery Grants (DG), Research Tools and Instruments (RTI), and Postdoctoral Fellowships (PDF); 2019 – 2022 competition data for DG, RTI and PDF programs, and 2009 – 2018 competition data for the Steacie Fellowships program). Asterisks (*) in figure represent statistically significant differences between application rates and award rates ($P<0.05$). Award rates were significantly lower than application rates for institutions in the Atlantic in the DG and RTI programs, for institutions in Ontario in the RTI and PDF programs and for institutions in the Prairies in the RTI program. Award rates were significantly higher than application rates for institutions in Quebec in the RTI program and for institutions in the Pacific region in the DG and RTI programs, as well as for foreign institutions in the Postdoctoral Fellowships program.

The analyses considered applicants' institutions according to the region where they are located including the provinces of Ontario and Quebec, and the provinces in the Pacific (British Columbia), Prairies (Alberta, Manitoba and Saskatchewan), and Atlantic (Newfoundland and Labrador, PEI, New Brunswick, and Nova Scotia) regions of Canada. In this case, data shows that institutions in the provinces of Ontario and Quebec submitted the largest proportion of applications and received the largest proportion of awards for the programs for which quantitative data is considered (Figure 6b).

Table 3. Proportion of Full-time faculty in Canada according to five Canadian regions: Atlantic, Quebec, Ontario, Prairies, and Pacific (Stats Canada 2023a).

Region	Proportion of Full-Time Faculty
Atlantic	9.8%
Quebec	25%
Ontario	36%
Prairies	18%
Pacific	11%

Although the proportion of applications and awards were higher overall for researchers in the provinces of Ontario and Quebec and lower for those in the Atlantic and Pacific provinces, this is not surprising when these numbers are considered along with the proportion of full-time faculty in each region (Table 3).

Other considerations – Data availability for some groups

When considering the participation of equity-deserving and rights-holding groups in NSERC funding opportunities, one primary theme that emerges is the need for more data. This was important for nearly all equity-deserving and rights-holding groups under investigation but especially for analyses of applicants identifying as Indigenous, persons with disabilities, and Two-Spirit, gender-fluid, or non-binary. Competition data on these groups showed that numbers were often too small to report given the need to protect applicants' privacy according to the Privacy Act. This also impeded the ability of programs to draw meaningful conclusions from the data, although the number of applications received seemed to be proportional to the number of awards for these groups. Nevertheless, the data that was available pointed to a trend suggesting consistent underrepresentation of members of these groups in all NSERC programs under analysis as compared to the proportion of persons identifying as members of these groups in the Canadian population and in the NSE populations eligible to apply to NSERC's programs.

In addition to data being limited for some groups, data was mostly unavailable for lesbian, gay, bisexual, transsexual, queer, intersex and asexual groups. Therefore, analyses from competition results for these groups was not possible at the time of writing this report. This being said, NSERC's self-identification questionnaire was modified in 2022 to include more gender-identity response options and to include a new question to gather data on sexual orientation. This data will allow NSERC to better monitor participation in programs according to these identity factors through future intersectional analyses in GBA Plus work. Despite the unavailability of data, it is important to recognize the growing evidence indicating that gender diverse and 2SLGBTQI+ groups are underrepresented in the STEM research ecosystem [Fisher 2021]. In addition, the small numbers gathered through competition data themselves provide valuable information and highlight the need to promote increased participation from persons self-identifying as members of these groups, and the need to continue data collection efforts for continued year-over-year monitoring. It also may indicate a hesitancy to self-identify during the application process and may point to persistent barriers for persons from these groups.

Challenges in acquiring self-identification data due to hesitancy from certain equity-deserving and rights-holding groups has been documented in the literature. For instance, persons identifying as 2SLGBTQI+ and/or as gender diverse are less likely to share their identity in professional settings and thus are less likely to self-identify in surveys [Fisher 2021]. This can lead to difficulties in acquiring an accurate measure of representation for these groups in the STEM research ecosystem in Canada. Similar challenges are identified when considering persons with disabilities and persons identifying as Indigenous. As noted from GBA Plus work of NSERC programs considered in this report, hesitancy to self-identify could be due to fear of stigmatization, to lack of information on how self-identification data is used or who may be able to access the data, and/or to self-identification being perceived as "bragging about oneself" which may be unacceptable in some cultural contexts. In

accordance with these observations, the thematic analysis of GBA Plus recommendations (Section 2) identified a need for more data for monitoring processes. In order to support this goal, another main recommendation was the need for additional clarity and communication with research communities regarding the reasons for the collection of self-identification data and on the way it is used. Further, it is important to note that while programs identified a need for more quantitative data for a number of equity-deserving and rights-holding groups, it was also highlighted that there is a need for more qualitative data through engagement with members of these groups to better understand and identify any persistent barriers.

Thematic analysis of GBA Plus Recommendations

As part of GBA Plus processes, program staff at NSERC consider quantitative and qualitative data, along with up-to date primary and secondary sources, to identify possible barriers to equity-deserving and rights-holding groups. Following these analyses, programs propose recommendations for evidence-based approaches that can contribute to mitigation and elimination of barriers for impacted groups.

For the current analysis, the recommendations resulting from fourteen funding opportunities' GBA Plus processes were compiled and coded, and the main themes within the recommendations were identified. In this section, we present the main themes identified following an inductive thematic analysis[22] of the recommendations for these fourteen funding opportunities (Table 4).

Table 4. Main themes and subthemes identified through an inductive thematic analysis of recommendations proposed following completion of GBA Plus work for fourteen funding opportunities at NSERC.

Theme 1 - Improve communication and guidance	
Subthemes	**Selected examples**
1. Ensure all program information is clear and accessible.	• Recommendations to improve clarity, to add and update details on programs, and/or to explore different application platform tools and alternate forms of communication to improve accessibility for equity-deserving groups, including persons with disabilities.
2. Ensure use of inclusive language in program literature in English and French.	• Recommendation to review program literature documents to ensure the use of inclusive language that permits an inclusive French translation. • Recommendations for additional guidance on the use of non-gendered, inclusive language in reference letters and during selection processes. • Avoid focus on prizes' namesakes to avoid unintentional focus on a specific gender, or other identity attributes for potential awardees.
3. Improve EDI training and guidance for applicants, reviewers and nominators.	• Recommendations to provide guidance and training to reviewers and committee members on the importance of EDI considerations and on guarding against bias in peer review. • Recommendations to implement and provide training on the Guidelines on the assessment of contributions to research, training and mentoring to strengthen the assessment of research excellence.
Theme 2 – Strengthen application and review processes to ensure fair assessment	

Subthemes	Selected examples
1. Emphasize the importance of diverse representation in selection committees.	• Recommendations to maintain and strengthen processes to ensure highly diverse committees with the capacity to review applications from diverse groups, for interdisciplinary projects (as needed), and in both official languages.
2. Broaden the range of contributions to research considered in selection processes.	• Explore mechanisms to ensure applicants describe, and members consider, a broad range of contributions and achievements.
3. Adjust application requirements to ensure fair assessment.	• Recommendations to adjust application requirements (e.g., through the use of narrative CVs instead of CCVs) and to modify selection criteria to more accurately reflect measures of excellence (e.g., break down Excellence of the Researcher criteria into subcategories that more clearly address the intended criteria).
Theme 3 – Ensure fair access to funding opportunities through program policies	
Subthemes	**Selected examples**
1. Modify eligibility criteria that may present barriers to participation.	• Adjust eligibility criteria to aid in increasing participation from community partners, Indigenous communities, and applicants with non-linear career paths, among others.
2. Expand and adjust program policies - including on eligible leaves and delays.	• Expand list of eligible leaves and delays in alignment with EDI best practices to remove barriers to groups that are most heavily impacted by leaves and delays.
Theme 4 – Improve data collection to monitor progress	
Subthemes	**Selected examples**
Increase data collection efforts to gain access to more data on equity-deserving and rights-holding groups.	• Recommendation to increase data collection efforts, especially from Indigenous groups, persons with disabilities and gender-diverse persons for whom data was very limited and impeded thorough analysis for monitoring purposes.

The following subsections briefly discuss each identified theme and most relevant subthemes in more detail, taking into consideration the type of recommendations proposed and the population groups impacted by the recommendations.

Theme 1: Improve communication and guidance

Ensure all program information is clear and accessible

One primary theme that emerged from the thematic analysis of the recommendations proposed for programs included language-related adjustments to communication strategies, including program literature, such as increased clarity and improved accessibility.

Clarity of program literature to facilitate access to information regarding funding opportunities was identified as an important consideration. For instance, to ensure that participation is not impacted by misunderstanding regarding eligibility criteria, the EIDM program highlighted the need to clearly state that interdisciplinary collaboration is encouraged and researchers outside of the mathematical and NSE communities are eligible to participate as collaborators. Interdisciplinary research has been noted to be an important element to addressing the many issues facing Canada and the world and it was a recurring topic discussed in the What We Heard report: Consulting on the development of the NSERC 2030 strategic plan. Interdisciplinary research can also contribute to increasing participation of equity-deserving and rights-holding groups since many populations of researchers who are currently underrepresented in NSERC programs and disciplines have higher enrollment and participation in other disciplines. For instance, according to the 2019 SPFR data, while only 0.7% of PhD students in the natural sciences and engineering disciplines identified as Indigenous, the proportion of individuals identifying as Indigenous was of 2.7% in the social sciences and humanities. This trend is also seen for persons with disabilities and across different career stages. For this reason, ensuring that the eligibility of groups outside of the NSE and mathematical communities is clear can be an essential strategy to remove a barrier and to strengthen research and increase participation of different groups.

Another strategy to remove barriers to access funding opportunities identified by programs following GBA Plus is to improve outreach to ensure that program information is available to all eligible populations. For instance, the Steacie and Strickland funding opportunities noted that awareness of these NSERC programs was uneven across different research communities and recommended wider outreach efforts to increase awareness for all eligible and potential candidates. This can be especially important with communities outside of academia, such as those in industry, and for smaller and rural institutions. Other recommendations to improve access to funding opportunities focused on addressing accessibility concerns. For instance, four programs identified a need to ensure that program information is made more accessible to all potential applicants, including persons with disabilities, which could include, among others, the use of plain language formats, closed captioning in videos, and implementation of new tools as needed.

Ensure use of inclusive language in program literature in English and French

The incorporation of inclusive, non-gendered language throughout all program literature in both official languages was also a common recommendation. In total, seven funding opportunities highlighted items within the program's literature where gendered language should be replaced while considering inclusive language practices. For instance, it was noted that special consideration is needed to identify gender-neutral forms in French for terms that are gender neutral in English but not in French such as "researcher" (*chercheur/chercheuse*). French language program literature was especially highlighted for careful review to ensure that inclusive language is used in both official languages.

Recommendations for the use of inclusive language also included recommendations to improve guidance on the use of non-gendered, inclusive language for reviewers and for individuals providing reference letters for applicants in order to help to minimize potential bias during the peer review process [Correll et al. 2020, Formanowicz and Hansen 2022, Sato et al. 2021, Henry et al. 2017]. Further, the NSERC Joint Prizes analysis, revealed a need to minimize focus on the prizes' namesakes which may be restricting the group of nominated persons. Evidence has shown that the use of gendered language can influence the application and nomination pools for individuals (Gaucher et al. 2011, Bazner et al. 2021), and therefore, it is possible that nominators unconsciously select candidates whose identity factors (e.g., sex/gender) mirror those of the prize's namesake or biographical descriptions. This could restrict the diversity of the nominee pool.

Improve training and guidance for applicants and reviewers

A central theme among recommendations for funding opportunities was improving guidance for the communities served by NSERC (including, but not limited to: reviewers, nominators, applicants and co-applicants, and collaborators), especially on EDI considerations and EDI best practices. Some specific recommendations included guidance for reviewers on the consideration of a wider range of achievements in peer review and the need for more diverse selection criteria, and the importance of effective training to minimize effects of unconscious bias in peer review. For instance, the DIS program highlighted that many committee members are not in Canada and may not be familiar with NSERC's initiatives or approaches relating to EDI. Therefore, the DIS program proposed providing additional background information for international members to improve clarity regarding EDI considerations within a Canadian context.

To support the implementation of EDI considerations as an application requirement, some recommendations for NSERC programs, including the DG, RTI, Encouraging Vaccine Confidence, EIDM and DIS funding opportunities, highlighted the need to provide guidance to applicants on *why* and *how* to integrate EDI considerations in their applications. Specifically, NSERC programs recommended clarity in guidance pertaining to the incorporation of EDI considerations in the research process and for building and maintaining diverse research teams and inclusive environments. For instance, the DIS, EIDM and RTI programs recommended adding instructions to assist applicants in demonstrating the plans for practices and policies that they will employ to support an equitable, diverse and inclusive team environment and to address potential barriers to foster diverse and inclusive participation in their teams. Progress towards these recommendations has already begun with the recent publication of the NSERC Guide on Integrating equity, diversity and inclusion consideration in research which provides clearer and more precise guidance for reviewers than previously offered.

Theme 2: Strengthen application and review processes for fair assessment

Emphasize the importance of diverse representation in selection committees

The most common recommendations presented regarding the application and review processes included suggestions for the composition of review committees and for the requirements and responsibilities of committee members.

The results of analyses for several funding opportunities highlighted the importance of continuing to ensure broad representation in committees, providing a wide range of expertise and perspectives, which support the assessment of interdisciplinary research and of applications in both official languages. Although NSERC programs already adhere to the Guidelines Governing Membership of NSERC's Peer Review Committees, which aim to ensure representation in committees of different groups including women, Francophone populations, and members of visible minority[6]/racialized[14] groups, among others, the recommendations following GBA Plus emphasized the importance of diversity in review committees and some programs notably the RTI program, also recommended going further by setting additional targets for review committee composition, and to continue efforts to increase representation for members from smaller institutions and at different career stages. An increase in participation in review committees by members of equity-deserving and rights-holding groups, however, must also take into consideration the time demands that this service imposes on individuals. As stated in the 2021 report of the Council of Canadian Academies, caution must be exercised to ensure that service workloads do not interfere with these individuals' primary research and teaching responsibilities. In addition, it is important to provide training on equity, diversity and inclusion considerations in research and support to all committee members to ensure that the responsibility does not exclusively fall on committee members from equity-deserving and rights-holding groups.

Further, to improve current processes for the monitoring of diversity in committees, several analyses highlighted the need for additional data from those serving as reviewers for NSERC competitions, including external reviewers. For instance, one common recommendation was to make it mandatory to complete a self-identification questionnaire for data collection and analysis (while still allowing for the option to select "prefer not to answer"). It is important to note that at the time of writing this report, these recommendations have been implemented at NSERC for selection committee members, and plans are underway to extend the mandatory self-identification requirement to external reviewers.

Broaden the range of contributions to research considered in selection processes

Recommendations for changes to selection criteria were frequently proposed to ensure a more comprehensive assessment of research excellence, one that allows for a wider recognition of contributions to research and recognizes EDI as an essential component of excellence in research.

Nine out of the fourteen funding opportunities considered in this review (DG, RTI, Synergy, Strickland, Herzberg, Polanyi, Brockhouse, DIS, and PDF) presented recommendations to adjust or introduce selection criteria to strengthen the assessment of research excellence. Recommendations within this subtheme were in line with changes implemented by other national and international funding agencies and with current literature on EDI best practices and on the responsible assessment of research and contributions to research (DORA, Global Research Council 2023, Curry et al. 2020). Some recommendations included the reframing of research excellence by prioritizing achievements rather than status of applicants in their field, removal of elements of the review process that are influenced by the status or reputation of researchers and referees, and modifications to selection criteria to remove potential sources of bias. For instance, the analysis of the Herzberg Prize included a recommendation to move away from assessing nominees in comparison to their "international peers and other recognized stars in the field", while instead reframing the criteria to focus on how broadly impactful their achievements are in the context of the selection criteria

for the prize. Further, in light of the fact that ECRs tend to have lower success rates than more established researchers, the RTI program proposed adjusting selection criteria to eliminate possible bias against ECRs. Following GBA Plus investigations and consultations, it was identified that ECRs may be disadvantaged due to their lower level of experience working with certain equipment, and it was recommended to add dedicated space in the application form to allow ECR applicants to elaborate on how they will gain the needed training and skills rather than focusing solely on previous experience with the equipment. Similarly, the PDF program recognized a need to reduce unconscious bias in peer review and suggested adjusting the evaluation scale by dividing the primary review criteria, "Researcher Ability and Potential", into two or more criteria which are more clearly defined to reflect the targeted areas of evaluation.

Adjust application requirements to enable fair assessment

In line with recommendations to broaden the range of contributions to research in the selection process, changes to application requirements can contribute to the fair assessment of applications. One common adjustment that was recommended for five funding opportunities (DG, PDF, Brockhouse prize, Polanyi award, and Herzberg medal) was to move away from the use of the Canadian Common CV (CCVs) and to explore adopting the use of hybrid or narrative CVs. Although still being reviewed, narrative CVs are a promising option which have been shown to make comparisons between applications on qualitative criteria easier for reviewers, and to benefit applicants who are ECRs or who have followed a non-linear career path [Hatch and Curry 2020]. The use of narrative CVs has also been shown to increase diversity by reducing potential bias in peer review since it minimizes focus on gaps in productivity due to periods of leave and emphasizes applicants' most relevant and important contributions rather than focusing on quantity of contributions [Gossink-Melenhorst 2019]. To minimize sources of unconscious bias, other recommendations included removing the requirement for reference letters, which often include gendered language and are a source of potential bias and removing applicants' names from materials provided to reviewers to reduce unconscious biases based on applicants' names. This practice is supported by research that shows that bias can be introduced when the person's name suggests information about a person's ethnic or cultural background [Henry et al. 2017]. Although some issues were also highlighted in the 2021 report of the Council of Canadian Academies where it was noted that anonymization of applications for research funding can be ineffective as applicants may be identified from their publications which leads to additional biases and concerns.

Other recommendations included adjustments to application materials to help keep a focus on achievements and to minimize the influence of researchers' status in applications. Notably, the NSERC Joint Prizes analysis recommended the removal of the requirement to submit a paragraph on the nominator's background since this can introduce bias based on the status of the nominator.

Results of GBA Plus for NSERC funding opportunities also highlighted the importance of integrating EDI considerations in research. Evidence has shown that research is strengthened when EDI considerations are integrated where relevant in all aspects of research including in the building and maintenance of research teams and throughout the research process [Koning et al. 2021, Hofstra et al. 2020, Vandenberghe 2021]. Recommendations to incorporate requirements for the consideration of EDI at all stages of research were therefore proposed frequently for NSERC funding opportunities. For instance, the DG program proposed the introduction of a new module within the application to provide additional space for applicants to elaborate on how EDI considerations were accounted for in their research plans or, in cases where EDI considerations are not relevant, to indicate why they were not applicable.

Theme 3: Modify program design and policies to support fair access

Modify eligibility criteria that may cause barriers

Another common set of recommendations was to modify eligibility criteria to help mitigate barriers and make programs more accessible to eligible individuals. Ten out of the fourteen analyses considered, namely, the Steacie program, Synergy awards, RTI, NSERC Joint Prizes, PDF, Encouraging Vaccine Confidence in Canada, EIDM and DIS, proposed recommendations to broaden or remove eligibility criteria that impact participation of equity-deserving and rights-holding groups. For instance, some funding opportunities, including EIDM, DIS and Synergy, found that the eligibility criteria for application to their program was restrictive and unintentionally resulted in barriers for collaboration with Indigenous groups and community organizations who were not in NSE fields or in academia. Similarly, other programs, including the PDF, Brockhouse prize, Polanyi award and Herzberg medal, found that some eligibility criteria could present barriers for applicants experiencing delays and applicants following non-traditional career paths. These programs recommended revising eligibility criteria to allow a wider pool of applicants, co-applicants and collaborators to participate in NSERC programs.

Expand and adjust program policies

One common theme identified was the need for increased flexibility of policies that were deemed to pose barriers to specific groups. Funding opportunities such as Synergy, USRA, and PDF recommended increased flexibility for different program policies or requirements such as: flexible work terms for USRAs; reduced restrictions on eligible locations of tenure for PDF awards; and reduced restrictions on eligible expenses for awards like RTI and EIDM. In addition, the DG, and Steacie funding opportunities proposed expanding eligibility for delays in research. For example, the DG program analysis showed that the types of eligible leaves and delays in research could be expanded to align with those from other Canadian and international funding agencies. Restrictions regarding the type of eligible leaves and delays can have a disproportionate impact and present barriers for applicants from certain groups such as women, individuals with family responsibilities, and persons with disabilities including those experiencing mental health challenges. Further, the DG program GBA Plus notes that including a wider list of eligible delays such as international relocation, delays due to non-research related employment and part-time positions can help reduce barriers for ECRs.

Adjust program design to facilitate fair access

Another important theme that emerged through the thematic analysis was the need to review application and review processes to ensure clarity and ease of access to information. For instance, programs such as DG, noted that the volume of program literature, resources and guidance that applicants need to read and consider prior to applying could be a barrier to some applicants, especially those at smaller institutions or receiving less institutional support. A recommendation was, therefore, to review the program literature for opportunities to consolidate and clarify the information presented. In addition, the simplification of the application process may address the need to increase accessibility to NSERC programs. For instance, the GBA Plus of the RTI program highlighted that the online platform provided limited options for persons with disabilities to apply to and to communicate with NSERC. It was therefore recommended that more accessible application platform tools and different forms of communication be explored to improve accessibility.

Theme 4: Improve data collection and monitor progress

Increase data collection efforts to gain access to more data on equity-deserving and rights-holding groups

Data collection is a central theme when considering recommendations for three specific groups: Indigenous Peoples, persons with disabilities, and gender-diverse persons. In this section, the main themes related to monitoring and data collection that emerged from the recommendations proposed are briefly reported.

A thematic analysis of the recommendations resulting from GBA Plus identified that data was a common concern for all programs for which data from competition results were available. Namely, many NSERC programs (DG, EIDM, DIS, PDF, and RTI) noted that numbers were too small for meaningful statistical analysis especially for some equity and rights-holding groups including Indigenous Peoples, persons with disabilities, and gender diverse persons applying to NSERC and serving on NSERC review committees. In response to the identified data concerns, programs such as EIDM recommended that completing the self-identification questionnaire be made a mandatory requirement for applicants and reviewers (while still providing the response option “I prefer not to answer” for each question). Further, the USRA program identified the need to develop a process to collect data on applicants to the program through collaboration with universities since currently the USRA program does not have complete access to applicant data. It is important to highlight that following these recommendations, it is now mandatory for applicants to complete a self-identification questionnaire when applying for funding from NSERC programs where relevant. Data remains unavailable, however, for the USRA program for which applicants do not submit applications to NSERC directly since the review process is devolved to the universities.

The need for more data was also relevant for Francophone applicants. The DG program highlighted a need for greater availability of language-related data as it applied to applicants’ preferences and not just language of application. Since applicants may submit their application in the official language of their choice, it is unclear by considering language of application alone whether an applicant’s preferred language or first language is English or French. Therefore, in order to better monitor participation of Francophone applicants in NSERC programs, collecting additional data was considered an important suggestion. That being said, the new self-identification survey launched in 2021 includes questions that request information on

applicants' first official language and the language they most commonly use at home. These new questions will help to better monitor the participation of Francophone applicants in NSERC programs regardless of the language of application or the preferred language of communication.

It is also important to highlight that in addition to the need for more quantitative data for certain groups, the GBA Plus of NSERC programs also identified a need for more qualitative data. Recommendations included increasing engagement with applicants and stakeholders to collect data regarding the experiences of applicants as it applies to NSERC programs in order to better understand the barriers that members from the NSE research community may be experiencing.

In close relation with the theme of data collection, programs such as DIS and RTI indicated that more information should be provided to applicants and review committee members on the purpose and use of self-identification data, as well as the measures in place to ensure confidentiality of information and privacy. This strategy is intended to reduce the rate of individuals who may be choosing to not self-identify, which is a concern primarily for populations such as Indigenous Peoples, persons with disabilities, and persons self-identifying as members of 2SLGBTQI+ groups who may prefer to not self-identify due to perceptions that this may have a negative impact on their application.

Conclusion

In line with the Tri-Agency EDI Action Plan, NSERC is committed to continuing to work towards ensuring fair access to funding opportunities and fair assessment of applications to contribute to a more equitable postsecondary research ecosystem in Canada. As part of this effort, NSERC applies GBA Plus to take a critical look at its funding opportunities to identify and address barriers that limit access to programs and funding.

Key findings

When considering the available quantitative data for the programs included in this report, results show that application rates are similar to award rates for women and Francophone applicants. These results suggest that NSERC's review processes do not present major barriers for these equity-deserving groups. However, GBA Plus results also revealed that, despite small count numbers and limited availability of data for several groups, award rates were lower than application rates for some groups including persons with disabilities, persons identifying as Indigenous and for members of some visible minority groups, indicating that important barriers persist and highlighting the need for continued efforts to address and eliminate these barriers.

GBA Plus results also revealed underrepresentation of some groups which also points to the persistence of barriers to participation. Specifically, analyses showed that persons self-identifying as women, Indigenous, Black and persons with disabilities are underrepresented in applications to NSERC programs when compared to the representation of these groups in the Canadian population and in the populations of eligible NSE researchers. In addition, when considering participation of Francophone populations, although data numbers were small, a preliminary analysis with newly available language data from 2022 for the DG, RTI and PDF programs revealed that Francophone applicants may also be underrepresented in comparison to their representation in the larger Canadian population. The analyses for Francophone populations also showed a preference to submit applications in English despite the applicants' expressed preferred language for communication, first language or language most spoken at home. Participation by Francophone communities and the willingness of researchers to participate in French will require careful monitoring in the future as more data becomes available.

To better understand the barriers faced by equity-seeking and rights-holding groups, gaps in both quantitative and qualitative data need to be addressed. Specifically, more data, including data from additional competition years, are needed for some groups to allow for meaningful statistical analysis and monitoring of year-over-year progress. This is especially important to monitor participation of groups for which data limitations were more severe including researchers identifying as Indigenous, persons with disabilities and as members of 2SLGBTQI+ groups. Further, NSERC recognizes the need to collect more qualitative data, through the means of surveys, questionnaires, and consultations with internal and external stakeholders to gain a more thorough understanding of the specific barriers impacting different groups of researchers and the best ways to continue to work towards the elimination of barriers to fair access and fair assessment.

NSERC Actions

NSERC is committed to achieving fair access to funding opportunities and to continuing to improve assessment processes in alignment with evidence-based best practices to provide fair and responsible assessment to reward excellence in research. In line with these efforts, recommendations have been proposed to address barriers and gaps as identified through the analyses conducted using GBA Plus methodology at NSERC. These recommendations have resulted in many changes, new initiatives and new funding opportunities that aim to address, mitigate and eliminate barriers to fair access to NSERC programs and to fair assessment. Some examples include: the development of strategic plans such as the Setting new directions to support Indigenous research and research training in Canada strategic plan, the NSERC accessibility plan, and the Tri-agency EDI action plan; the creation of publicly accessible Interactive data dashboards to continue to monitor participation of all equity-deserving and rights-holding groups in NSERC programs; focused program initiatives including the Black Scholars' funding initiative, the NSERC Indigenous Student Ambassadors program, the Chairs for Women/Inclusion in Science and Engineering programs and the PromoScience program; the development of policies and guidelines such as the NSERC Guide on integrating equity, diversity and inclusion considerations in research, the Guidelines on the assessment of contributions to research, training and mentoring; and through the establishment of advisory groups such as the Reference Group for the Appropriate Review of Indigenous Research which are intended to strengthen NSERC review processes.

Findings and recommendations from GBA Plus processes are considered and integrated when making changes to existing programs and policies and when developing new programs, policies and initiatives to support NSE research and researchers in Canada. Through this process, NSERC aims to continue to support excellence in research through the continued development of a more diverse, equitable, inclusive, and accessible research ecosystem in Canada.

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[1] A note on terminology – In this report, the term "rights-holding" refers to persons who self-identify as Indigenous Peoples of Canada. Further, the term "equity-deserving groups" is defined as "a group of people who, because of systemic discrimination, face barriers that prevent them from having the same access to the resources and opportunities that are available to other members of society, and that are necessary for them to attain just outcomes", and is used in this report to refer to groups such as women, persons with disabilities, visible minorities/racialized groups, and members of the 2SLGBTQI+ communities. These terms were selected in alignment with guidance from the Government of Canada's Guide on Equity, Diversity and Inclusion Terminology.

[2] The terms "funding opportunities" and "programs" are used interchangeably throughout this document.

[3] The E.W.R. Steacie Memorial Fellowships were rebranded as the Arthur B. McDonald Fellowships after 2021.

[4] The GBA Plus for the E.W.R. Steacie Memorial Fellowships was conducted before the launch of the tri-agency's self-identification questionnaire. Data availability for analyses improved greatly after 2019.

[5] Note that the Brockhouse prize, the Herzberg medal, and the Polanyi award were analyzed jointly and are referred to as the "NSERC Joint Prizes" analysis in this report. Further, quantitative analyses were still in progress for these programs as of June 2022 and therefore results were not available to be included in this report.

[6] In this section, the terms used to refer to different groups are selected according to the terms that were used at the time of data collection using the self-identification questionnaire. Therefore, although we recognize some terms are outdated in their use, the selected terms are used to align with the data collected from applicants.

[7] When conducting analyses of APR and AWR for specific equity-deserving and rights-holding groups, data from applicants who selected "prefer not to answer" were excluded from the analyses.

[8] This report uses data from the larger Canadian population (2021 Census) to draw comparisons instead of data from the labour force. The values do not differ greatly for most groups, except for the group of persons with disabilities where the proportion of the Canadian population which reports having a disability is 22.3% while the proportion of the Canadian labour force which reports having a disability is of 9.1% (Statistics Canada 2023b).

[9] The pool of researchers eligible to apply for the Postdoctoral Fellowships program is composed of the populations of postdoctoral fellows and a subset of eligible PhD students in the natural sciences and engineering fields. Namely, the group of PhD students who are in their final years and expect to complete their PhD prior to the beginning of their proposed postdoctoral fellowship.

[10] Note that data for gender-diverse individuals and 2SLGBTQI+ communities was too limited at the time of this report to draw meaningful conclusions. As a result, only persons self-identifying as women are included at the time of this analysis.

[11] For the E.W.R. Steacie Memorial Fellowships, awardees were selected from a pool of nominees rather than from applications.

[12] During the 2022 competition year, NSERC employed a process to improve equity in funding decisions in the PDF program. This process aimed to ensure that the proportion of short-listed and funded applications from those who self-identified as women or Indigenous was at least similar to the proportion of applications received from these groups. This rebalancing of proportions was only used as needed, and only for meritorious applications. For more information on this process, please consult the Selection committee guide for Postgraduate Scholarships – Doctoral and Postdoctoral Fellowships programs.

[13] According to the guidelines presented in the web page "Inclusive Writing - Guidelines and Resources" prepared by the Translation Bureau, Public Services and Supply Canada (2022), the use of doublets is considered an appropriate option to ensure that "women have equal visibility with men. Unlike the generic masculine, doublets make the presence of female persons explicit." However, it should also be noted that doublets "are part of a logic of female-male binarity and are not considered perfectly inclusive of non-binary people".

[14] Note that the replacement of terms associated with one specific gender, such as “leadership”, does not entail changing the requirements for the excellence of awardees. Rather, the change recommends that the wording used to describe the selection criteria reflect the specific qualities required while using terminology that is non-gendered, inclusive and specific (For example, employing terms that indicates what it means to be a leader such as supportive mentorship, taking initiative, etc).

[15] A note on terminology: For this report, we adopt the definition of "racialized" as described in the Equity, Diversity and Inclusion Terminology Guide. This term refers to “a person or group of people categorized according to ethnic or racial characteristics and subjected to discrimination on that basis. The use of the term ‘racialized’ acknowledges that race is a social construct that negatively impacts a person's social, political and economic life”.

[16] A note on terminology: The term underrepresented is used in this report to denote lower participation or representation of certain groups in funding opportunities’ applications and awards, as compared to their representation in other reference populations such as the Canadian population or the population of individuals eligible to apply to the given funding opportunity.

[17] In order to maintain privacy of applicants and awardees, and in alignment with best practices for data de-identification, data where cell values are equal to or smaller than 10 are redacted and omitted from publication. [Treasury Board of Canada 2020]

[18] Eligible Indigenous population numbers and award rates for Indigenous researchers for the RTI and PDF programs were too small to be included.

[19] In order to be eligible to apply to the RTI program, applicants must be recipients of a DG award. Therefore, the eligible pool of applicants for the RTI program is composed of DG awardees.

[20] According to Statistics Canada, "the first official language spoken is a derived variable based on the responses to language questions in the Census of Canada”. (Statistics Canada 2021)

[21] In this report, we approximate the definition of Francophone populations as used by Statistics Canada for ease of data comparisons. However, since data collected by NSERC does not match data collected by Statistics Canada exactly, this can present a limitation for comparison purposes.

[22] In contrast to theoretical or deductive thematic analysis, inductive thematic analysis is a bottom-up approach to qualitative data analysis which is strongly data-driven (Braun and Clark 2006).

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