



## Guide for Applicants: Considering equity, diversity and inclusion in your application

The Evidence is clear. Equity, diversity, and inclusion strengthen the scientific and engineering communities and the quality, social relevance and impact of research.<sup>i</sup> Increasing diversity and gender equity in the research enterprise are key priorities for NSERC<sup>ii</sup> and for the Government of Canada.

This commitment is acted upon primarily through NSERC's Framework on Equity, Diversity and Inclusion.<sup>iii</sup> The actions in this Framework implement a Tri-Agency response to the 2012 Council of Canadian Academies [report](#) on *Strengthening Canada's Research Capacity: the Gender Dimension*. The actions also implement NSERC's 2015 commitment to the Status of Women Canada Departmental Action Plan on Gender-based Analysis.

This Guide for Applicants document provides applicants with resources regarding what equity, diversity and inclusion mean in natural sciences and engineering research teams and research design and how their incorporation contributes to research excellence.<sup>iv</sup>

NSERC is integrating equity, diversity and inclusion (EDI) considerations into its policies, processes, indicators of excellence and evaluation criteria. Our community will be informed of any changes and effective dates in advance of application deadlines. NSERC encourages applicants to explain their process of identifying, recruiting and selecting research personnel based on equity, diversity and inclusion best practices<sup>v</sup> as one means to enhance excellence in research, training and outreach. This does not apply to scholarships and fellowships applicants. Starting in 2018, some programs will also be asking applicants how sex, gender and diversity considerations are integrated into their research design and analysis, when applicable.

The following **definitions**, **key questions** and **resources** are intended to provide applicants with information on how research personnel and research program design benefit from equity, diversity and inclusion best practices. For further information contact your program officer or [nseequity-equitesng@nserc-crsng.gc.ca](mailto:nseequity-equitesng@nserc-crsng.gc.ca).

**Please refer to the Program Description and Application Instructions of the program you are applying to for specific requirements relating to equity, diversity and inclusion considerations among research personnel and/or in research design.**

### Definitions

**Gender** refers to the socially constructed roles, behaviours, expressions and identities of girls, women, boys, men, and people with diverse gender identities.<sup>vi</sup> It influences how people perceive themselves and each other, how they act and interact, and the distribution of power and resources in society.

Gender is usually conceptualized as a binary (girl/woman and boy/man) yet there is considerable diversity in how individuals and groups understand, experience, and express it.<sup>vii</sup>

**Sex** refers to a set of biological attributes in humans and animals. It is primarily associated with physical and physiological features including chromosomes, gene expression, hormone levels and function, and reproductive/sexual anatomy. Sex is usually categorized as female or male but there is variation in the biological attributes that comprise sex and how those attributes are expressed.<sup>viii</sup>

**Gender-based analysis plus (GBA+)** is an analytical process used to assess the potential impacts of policies, programs, services, and other initiatives on diverse groups of women, men and people with diverse gender identities, taking into account multiple identity factors. The "plus" in the name highlights that GBA+ goes beyond gender, and includes the examination of a range of intersecting identity factors (such as age, education, sexual orientation, parental status/responsibility, immigration status, Indigenous status,<sup>ix</sup> religion, disability, language, race, place of origin, ethnicity, culture and socio-economic status).<sup>x</sup>

**Sex and gender-based analysis plus (SGBA+)** is an approach that systematically examines sex-based (biological) and gender-based (socio-cultural) differences between men, women, boys, girls and people with diverse gender identities.<sup>xi</sup> If you only look at sex or only look at gender, you can miss part of the story. People often see differences between men, women and people with diverse gender identities and either assume these are biological or socio-cultural when they might be the opposite or a combination of both. As in GBA+, the "plus" highlights that the analysis goes beyond sex and gender, and includes the examination of a range of intersecting identity factors (noted in the GBA+ definition above).<sup>xii</sup> Sex and gender (and multiple intersecting identity factors) can influence all stages of research or development processes, from considerations for establishing priorities and building theory to formulating questions, designing methodologies, and interpreting data. Many pitfalls can be avoided—and new ideas or opportunities identified—by designing SGBA+ into research from the start. Integrating SGBA+ alongside other methodologies that serve to mitigate bias creates a higher standard of rigour in science and engineering research, policy and practice.<sup>xiii</sup>

**Equity** means fairness; people of all identities being treated fairly. It means ensuring that the processes for allocating resources and decision-making are fair to all and do not discriminate on the basis of identity. There is a need to put measures in place to eliminate discrimination and inequalities which have been well described and reported and ensure, to the best degree possible, equal opportunities. Equity is needed to achieve equality.<sup>xiv</sup> For example, treating people as equals in an environment in which historical and systemic disadvantages prevent people from operating as equals can be inequitable – it lacks the fairness of a truly equitable situation.

**Equality** means experiencing the freedom to develop and make choices unhindered by stereotypes, roles and prejudices; that the different behaviours, aspirations and needs of people are considered,

valued and favoured equally. It does not mean that people have to become the same, but that their rights, responsibilities and opportunities do not depend on their identity.<sup>xv</sup>

**Diversity** consists of the conditions, expressions and experiences of different groups<sup>xvi</sup> identified by age, education, sexual orientation, parental status/responsibility, immigration status, Indigenous status, religion, disability, language, race, place of origin, ethnicity, culture, socio-economic status and other attributes. Recognizing and valuing diversity must be accompanied by concerted efforts to ensure inclusion of diverse populations, meaning that individuals are and feel valued, respected and equally supported.<sup>xvii</sup>

**Inclusion** requires creating an environment in which all people are respected equitably and have access to the same opportunities. “Organizationally, inclusion requires the identification and removal of barriers (e.g., physical, procedural, visible, invisible, intentional, unintentional) that inhibit [applicants’] participation and contribution. Inclusion also requires [NSERC and awardees ] to demonstrate ... values and principles of fairness, justice, equity, and respect ... by being open to different voices and perspectives, developing an understanding of different cultures, experiences and communities, and making a conscious effort to be welcoming, helpful and respectful to everyone.”<sup>xviii</sup>

**Intersectionality** recognizes that inequities are never the result of single, distinct factors. Rather, they are the outcome of intersections of different social locations, power relations and experiences.<sup>xix</sup>

**Unconscious bias** is an implicit attitude, stereotype, motivation, or assumption that can occur without one’s knowledge, control, or intention. Unconscious bias is a result of one’s life experiences and affects all types of people. Everyone carries implicit or unconscious biases. Examples of unconscious bias include gender bias, cultural bias, race/ethnicity bias, age bias, language and institutional bias. Decisions made based on unconscious bias can compound over time to significantly impact the lives and opportunities of others who are affected by the decisions one makes.<sup>xx</sup>

## Key Questions

### Diversity and equity in research teams

1. *What are the benefits of increasing the participation of under-represented groups among co-applicants, collaborators and trainees?*

*Better research outcomes:* Sound diversity and equity practices ensure NSERC draws from a more extensive, representative and diverse pool of Canadian talent,<sup>xxi</sup> while increasing the integrity and excellence of a research program. Diverse experiences and approaches to knowledge creation increase the spectrum of ideas and insights which broadens and vastly improves our chances of producing breakthrough discoveries and innovation. Diversity is linked to increased creativity, productivity, engagement and innovation. “Encouraging greater diversity

is not only the right thing to do: it allows scientific organizations to derive an ‘innovation dividend’ that leads to smarter, more creative teams, hence opening the door to new discoveries.”<sup>xxii</sup> Additionally, providing research personnel with information on the benefits of EDI in teams means they can be aware of and advance relevant practices.

*Diverse role models:* diverse research personnel provide a diverse set of role models who can mentor and activate students in different ways.

*Recruitment and retention:* Flexible and diverse work places have more success in recruitment. Implementing a comprehensive training plan for diverse trainees increases the pool of diverse talent, at the same time increasing pathways for growth and the likelihood of retention.<sup>xxiii</sup>

2. *Why is equitable mentorship for all trainees needed (what are the issues/problems and benefits)? What does it mean to provide equitable mentorship?*

Applicants are encouraged to consider how to promote and support a variety of forms of mentoring that recognize barriers to trainees’ equitable participation and growth. Individuals who could benefit from mentoring may be unable to find mentors because they are uncomfortable asking, or are searching for the “perfect fit” mentor.<sup>xxiv</sup> Mentoring opportunities provided to members of a research team should be available equitably. It is key to actively consider the possibility that underlying barriers can create the appearance of aptitude or interest differences between members of a group that may be misinterpreted.<sup>xxv</sup>

3. *What is an equitable and inclusive research and work environment (what are the issues/problems and benefits)? What measures can be taken to ensure this is achieved?*

An equitable and transparent research and work environment is one that ensures under-represented scientists have confidence that they will be assessed and welcomed based on their merit and excellence and not through a filter of active or unconscious bias. An outcome of this would likely be to encourage more talent to stay in natural sciences and engineering (NSE) fields.<sup>xxvi</sup> It is an inclusive environment where there is flexibility and all researchers feel they belong. Being aware of unconscious biases and institutional practices that diminish under-represented applicants’ confidence in their chances of success (as distinct from their confidence in their own qualifications, although this may also be impacted over time<sup>xxvii</sup>) is a first step.<sup>xxviii</sup> Research teams are encouraged to take the [Bias in Peer Review module](#) and the online Status of Women Canada [GBA+ training course](#).

For the past 15 years the percentage of women in NSE fields has remained close to 37% at the bachelor level, declining to 12.5% at the full professor level. Historically, initiatives aimed at improving gender balance have focussed on “fixing women” through targeted mentorships, programs and so forth without addressing the cultural and contextual bias and barriers that exist within our systems and structures. Women and other under-represented groups in NSE are

not the problem that needs fixing. The NSE culture and institutions need to be fixed to attract and retain the best talent of all identities and backgrounds and allow all members of the community to flourish.<sup>xxix</sup>

4. *How can diversity and equity be highlighted in networking and leadership training events?*

Networking and leadership training can integrate gender-inclusive language, unconscious bias training, GBA+ training and address institutional gender and diversity biases and practices that create or maintain barriers for under-represented groups. The trainers should be diverse (including non-minorities), providing role models and potential mentors to the trainees. A focus on practical tools and strategies for incorporating diversity and equity awareness into everyday life helps to normalize a culture that is truly inclusive. The content should highlight the benefits of diversity in teams and can also be designed in collaboration with a diverse training team.

### **Inclusion of sex, gender and diversity considerations in research**

Not all NSE research has potential sex, gender and/or diversity dimensions, but these dimensions are more pervasive than one might think.<sup>xxx</sup> At this time equity, diversity and inclusion factors are only included in the evaluation criteria for applications to some specific programs. Details are provided in the relevant program descriptions and application instructions. Selection committee members will be provided with resources and guidance on evaluating the integration of these considerations in applications in specific programs.

5. *Why consider sex, gender and diversity in research design?*

A growing number of studies show that consideration of sex, gender and diversity has the potential to make research more ethically sound, more rigorous and more useful.<sup>xxxi</sup>

Extrapolation of research results to the population as a whole, when they actually only apply to a portion of the population, is inaccurate and could lead to serious implications.<sup>xxxii</sup> “While there are research projects in which [diversity,] sex and/or gender may not be relevant in terms of the research content, it is well established that, where relevant, not integrating [diversity,] sex and gender analysis into the design, implementation, evaluation and dissemination of the research can lead to poor results and missed opportunities.”<sup>xxxiii</sup>

6. *How do I know if sex, gender and/or diversity considerations are relevant factors in my research?*

There are an increasing number of examples of NSE research that would have or do benefit from diversity, sex and gender considerations being included in the research design and process. A good source for such examples is the Stanford University [Gendered Innovations](#) project. The goal of the Gendered Innovations project is to provide scientists and engineers with practical methods for sex and gender analysis.<sup>xxxiv</sup> It is important to analyze sex and gender, but

examining how other factors intersect with sex and gender is also necessary.<sup>xxxv</sup> These factors or variables can be biological, socio-cultural, or psychological aspects of users, communities, customers, experimental subjects, or cells.

7. *How do I show that I have taken sex, gender and diversity into consideration in my application?*

The application instructions for the program you are applying to will provide guidance on how to show the measures you have taken to integrate sex, gender and diversity considerations into your research team and training plan and/or into your research proposal, if applicable.

In all programs NSERC encourages applicants to explain their process of identifying, recruiting and selecting research personnel based on equity and diversity best practices<sup>xxxvi</sup> as one means to enhance excellence in research, training and outreach.

**When** the funding program you are applying to asks you to consider sex, gender and diversity in your research proposal, if applicable (for most programs this will start in 2018), some questions you could ask yourself include:

1. Are sex (biological) considerations taken into account in this study? (Y/N)
2. Are gender (socio-cultural) considerations taken into account in this study? (Y/N)
3. Are diversity considerations taken into account in this study? (Y/N)
4. *(If you answer "yes" for any of these questions)* Describe how the sex and/or gender and/or diversity considerations will be considered in your research proposal.
5. *(If you answer "no" for one or more questions)* Explain why sex and/or gender and/or diversity are not applicable in your research proposal.

8. *How will inclusion of sex, gender and diversity considerations, when relevant, be taken into account in the evaluation of my application?*

At this time equity, diversity and inclusion factors are only included in the evaluation criteria for applications to some specific programs. Details are provided in the relevant program descriptions and application instructions. Currently, in most programs inclusion of these factors is voluntary, in the interests of enhancing excellence in research, training, outreach and impact.

Effective dates for inclusion in evaluation criteria will be provided in advance of application deadlines. At that time consideration of sex, gender and diversity will be integrated into program specific evaluation criteria. How reviewers are to consider the integration of sex,



gender and diversity considerations in your research team and in your research proposal (if applicable) will be explained in program specific peer review manuals and merit grids. Resources, training and reference materials will be made available to applicants and selection committee members in advance of inclusion of these factors in the evaluation criteria.

## **Selected resources**

### **Gender-based analysis plus**

Status of Women Canada [What is GBA+?](#)

Status of Women Canada. (2017). [GBA+: Beyond Sex and Gender.](#)

Status of Women Canada. (2017). [GBA+: Equality or Equity?](#)

Status of Women Canada. (2017). [Demystifying GBA+ job aid \(DOC\).](#)

### **Sex and gender-based analysis plus**

CIHR. (2017). Sex and Gender in Health Research [online modules.](#)

### **Diversity and equity in teams**

Gibbs, K. Jr. (2014). "[Diversity in STEM: What it is and Why it Matters.](#)" *Scientific American*, Sept. 10.

Ginther, D.K, et al. (2011). "[Race, Ethnicity and NIH Research Awards.](#)" *Science* Vol. 333, Issue 6045, pp. 1015-1019.

Hunt, V., D. Layton, and S. Prince. (2015). "[Why Diversity Matters,](#)" McKinsey & Company, global management consulting. Page 3.

Nielsen, M.W., S. Alegria, L. Börjeson, H. Etzkowitzd, H. J. Falk-Krzesinski, A. Joshi, E. Leahey, L. Smith-Doerrj, A. Williams Woolley, and L. Schiebinger. (2017). "[Gender diversity leads to better science.](#)" *PNAS*. February 21, 2017, Vol. 114, No. 8. 1740-42.

WWEST. (2014). "[The Business Case for Gender Diversity.](#)"

Woolley, A.W., C.F. Chabris, A. Pentland, N. Hashmi, and T.W. Malone. (2010). "[Evidence for a Collective Intelligence Factor in the Performance of Human Groups,](#)" *Science* Vol. 330 (6004) pp. 686-688.

### **Sex, gender and diversity in research design**

Stanford University. [Gendered Innovations](#) project.



CIHR. (2017). [Sex, Gender and Health Research Guide: A Tool for CIHR Applicants.](#)

CIHR. (2017). [Integrating Gender and Sex in Health Research: A Tool for CIHR Peer Reviewers.](#)

### **Intersectionality**

Setareh Rouhani. (2014). [Intersectionality-informed Quantitative Research: A Primer.](#) The Institute for Intersectionality Research and Policy, Simon Fraser University.

### **Unconscious bias**

#### [Bias in Peer Review module](#)

Moss-Racusin, C.A. et. al. (2014). "[Scientific Diversity Interventions.](#)" Science Vol. 343, Issue 6171, pp. 615-16.



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### Notes

<sup>i</sup> For references, please see Selected Resources. NSERC's [Statement on Equity, Diversity and Excellence in Natural Sciences and Engineering Research](#).

<sup>ii</sup> [NSERC 2020](#)

<sup>iii</sup> [NSERC Framework on Equity, Diversity and Inclusion](#).

<sup>iv</sup> Ginther, D.K, et al. (2011). [Race, Ethnicity and NIH Research Awards](#). *Science* Vol. 333, Issue 6045, pp. 1015-1019.

<sup>v</sup> CRC. (2017). [Equity, Diversity and Inclusion: Best Practices for Recruitment, Hiring and Retention](#); Gasman, M. (2016). "[The five things no one will tell you about why colleges don't hire more faculty of color](#)." The Hechinger Report; Women in Science & Engineering Leadership Institute (WISELI). (2012). "[Reviewing Applicants: Research on Bias and Assumptions](#);" Moss-Racusin, C.A. et. al. (2014). "[Scientific Diversity Interventions](#)." *Science* Vol. 343, Issue 6171, pp. 615-16.

<sup>vi</sup> Please note that gender, gender identity and gender expression terms are evolving.

<sup>vii</sup> CIHR. (2017). [Sex, Gender and Health Research Guide: A Tool for CIHR Applicants](#).

<sup>viii</sup> CIHR. (2017). [Sex, Gender and Health Research Guide: A Tool for CIHR Applicants](#).

<sup>ix</sup> Voyageur, C.J. and B. Calliou. (2000/2001). "[Various shades of Red: Diversity within Canada's Indigenous community](#)." *The London Journal of Canadian Studies*, Vol. 16.

<sup>x</sup> Status of Women Canada, [Gender-based Analysis Plus](#).

<sup>xi</sup> CIHR. (2017). [Sex, Gender and Health Research Guide: A Tool for CIHR Applicants](#).

<sup>xii</sup> Based on Status of Women Canada, [Gender-based Analysis Plus definition](#).

<sup>xiii</sup> Gendered Innovations, [Methods of Sex and Gender Analysis](#).

<sup>xiv</sup> [GBA+: Equality or Equity?](#) Status of Women Canada 2017.

<sup>xv</sup> Equity and Equality definitions draw on UNFPA [definitions](#).

<sup>xvi</sup> Status of Women Canada. (2017). [Introduction to GBA+ Glossary](#).

<sup>xvii</sup> CRC. [Equity, Diversity and Inclusion: Best Practices for Recruitment, Hiring and Retention](#).

<sup>xviii</sup> [The Institutional Diversity Blog](#), *Where equity, diversity and inclusion matter*. [Inclusion defined](#).

<sup>xix</sup> Hankivsky, Olena. (2014). "[Intersectionality 101](#)." The Institute for Intersectionality Research & Policy, Simon Fraser University; LearningNetwork. (2017). [Intersectionality](#). University of Western Ontario.

<sup>xx</sup> [Bias in Peer Review; Project Implicit](#). Wheeler, Ronald. (2015) "[We All Do It: Unconscious Behavior, Bias, and Diversity](#)." *Law Library Journal*, Vol. 107: 2.

<sup>xxi</sup> Canada Research Chairs. "[Guidelines for ensuring a fair and transparent recruitment and nomination process](#)."

<sup>xxii</sup> Nielsen, M.W., S. Alegria, L. Börjeson, H. Etzkowitz, H.J. Falk-Krzesinski, A. Joshi, E. Leahey, L. Smith-Doerr, A. Williams Woolley, and L. Schiebinger. (2017) "[Gender diversity leads to better science](#)." *PNAS*, February 21, 2017, Vol. 114, No. 8. 1740-42. Gibbs, K. Jr. (2014). "[Diversity in STEM: What it is and Why it Matters](#)." *Scientific American*, Sept. 10. Guterl, F. (2014). "[Diversity in Science: Why it is Essential for Excellence](#)." *Scientific American*, Oct. 1.

In a study of "[collective intelligence](#)," the authors found "This 'c factor' is not strongly correlated with the average or maximum individual intelligence of group members but is correlated with the average 'social sensitivity' of group members, the equality in distribution of conversational turn-taking, and the proportion of females in the group."<sup>xxxii</sup>

In the context of [industry](#), “companies in the top quartile for racial and ethnic diversity [in leadership] are ... more likely to have financial returns above their respective national industry medians.”

Hunt, V., D. Layton and S. Prince. (2015). “[Diversity Matters](#).” McKinsey & Company, p. 1-22. Page 3.

It is a common mistake to position equity and research excellence as incompatible and mutually exclusive. The belief that equity is prioritized at the expense of quality when EDI policies are in effect is a myth. Research that concludes that definitions of merit based on historical perspectives on how research should be performed and evaluated can in fact undermine the recognition of merit (Rice, Curt, “[6 Steps to Gender Equality](#).” Digital Science. (2015). “[The Value of Structural Diversity. Assessing diversity for a sustainable research base](#).” Digital Science and the Science Policy Research Unit, University of Sussex. Wilsdon, J., et al. (2015). [The Metric Tide: Report of the Independent Review of the Role of Metrics in Research Assessment and Management](#). DOI: 10.13140/RG.2.1.4929.1363.)

<sup>xxiii</sup> Westcoast Women in Engineering, Science and Technology. (2014). [The Business Case for Gender Diversity](#). University of British Columbia. Hunt, V., D. Layton, and S. Prince. (2015). “[Diversity Matters](#).” McKinsey & Company, p. 1-22. Page 3.

<sup>xxiv</sup> Zachary, L. (2010). Informal mentoring. *Leadership Excellence*, 27(2), 16.

<sup>xxv</sup> For related analysis, see the “Discussion and Conclusion,” Cukier, W., S. Smarz and M. Yap. (2012). [Using the diversity audit tool to assess the status of women in the Canadian financial services sector](#). *The International Journal of Diversity in Organisations, Communities and Nations*, 11(3),15-36.

<sup>xxvi</sup> “HEA National review.” P. 16.

<sup>xxvii</sup> De Welde, K. and S. Laursen. (2011). “[The Glass Obstacle Course: Informal and Formal Barriers For Women Ph.D. Students in STEM Fields](#).” *International Journal of Gender, Science and Technology*, Vol. 3, No.3.

<sup>xxviii</sup> (2016). “[HEA National Review of Gender Equality in Irish Higher Education Institutions](#).” Pages. 14-16.

<sup>xxix</sup> Cukier, W., S. Smarz and M. Yap. (2012). Using the diversity audit tool to assess the status of women in the Canadian financial services sector. *The International Journal of Diversity in Organisations, Communities and Nations*, 11(3), 15-36. [Gendered Innovations](#), Three Strategic Approaches.

<sup>xxx</sup> Gendered Innovations, “[Methods of Sex and Gender Analysis](#).” [Case Studies](#).

<sup>xxxi</sup> CIHR. (2017). [Integrating Gender and Sex in Health Research: A Tool for CIHR Peer Reviewers](#). Allen, K. (2017). “[Toronto neuroscientist tackling science, sex and sexism in women’s health](#).” Toronto Star June 3. The

Research Council of Norway. (2014). “[Gender Balance and Gender Perspectives in Research and Innovation: Policy for the Research Council of Norway 2013-2017](#).” Research Council of Norway.

<sup>xxxii</sup> Gendered Innovations, [Case Studies](#).

<sup>xxxiii</sup> Irish Research Council. (2013). [Gender Strategy and Action Plan 2013 – 2020: Ensuring Excellence and Maximising creativity and innovation in Irish Research](#). Government of Canada. (2015). [TCPS 2 – Chapter 4: Fairness and Equity in Research Participation](#). Government of Canada. (2015) [TCPS 2 - Chapter 9 Research Involving the First Nations, Inuit and Métis Peoples of Canada](#).

<sup>xxxiv</sup> Gendered Innovations, “[Methods of Sex and Gender Analysis](#).”

<sup>xxxv</sup> Hankivsky, O. and A. Christoffersen. (2008). Intersectionality and the Determinants of Health: A Canadian Perspective. *Critical Public Health*, 18 (3), 271-283.

<sup>xxxvi</sup> CRC Equity, Diversity and Inclusion: [Best Practices for Recruitment, Hiring and Retention](#); Gasman, M. (2016). “[The five things no one will tell you about why colleges don’t hire more faculty of color](#).” The Hechinger Report; Women in Science & Engineering Leadership Institute (WISELI). (2012) “[Reviewing Applicants: Research on Bias and Assumptions](#).”

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