COVID-19 gender policy changes support female scientists and improve research quality

Holly O. Wittemann*, Jenna Haverfieldb, and Cara Tannenbaumc,d,1

*Faculty of Medicine, Université Laval, Quebec City, QC G1V 0A6, Canada; bInstitute of Gender and Health, Canadian Institutes of Health Research, Ottawa, ON, K1A 0W9, Canada; cFaculty of Medicine, Université de Montréal, Montreal, QC H3C 3J7, Canada; and dFaculty of Pharmacy, Université de Montréal, Montreal, QC H3C 3J7, Canada

With more time being spent on caregiving responsibilities during the COVID-19 pandemic, female scientists’ productivity dropped. When female scientists conduct research, identity factors are better incorporated in research content. In order to mitigate damage to the research enterprise, funding agencies can play a role by putting in place gender equity policies that support all applicants and ensure research quality. A national health research funder implemented gender policy changes that included extending deadlines and factoring sex and gender into COVID-19 grant requirements. Following these changes, the funder received more applications from female scientists, awarded a greater proportion of grants to female compared to male scientists, and received and funded more grant applications that considered sex and gender in the context of COVID-19 research. Further work is urgently required to address inequities associated with identity characteristics beyond gender.

Results

The first competition funded 100 of 227 applications (overall success rate 44%). The second competition garnered greater application pressure, funding 139 of 1,488 applications (overall success rate 9%). From the first to second COVID competition, the proportion of applications submitted by principal investigators (PIs) who self-identified as female increased from 29 to 39%, and the proportion of successful applications with a female PI doubled from 22 to 45% (Table 1).

Discussion

By analyzing data before and after gender policy interventions implemented within COVID-19 rapid response funding, CIHR demonstrates ways to monitor and potentially redress inequities exacerbated by the pandemic. Offering compensation for dependent caregiver costs, extending early career status, doubling parental leave credits, and allowing for an optional COVID-19 impact statement to be submitted with grants are additional interventions that were applied. Gender policy interventions are an application intake window from 8 d to 19 d and allowed submission of abridged biosketches rather than requiring the use of the longer online Canadian Common CV. To increase research quality, CIHR created a guidance document titled, “Why sex and gender need to be considered in COVID-19 research” (13) and required reviewers to evaluate the integration of sex, gender, and other identity factors (e.g., age, race, ethnicity, culture, religion, geography, education, disability, income, and sexual orientation) at all stages of the research process.

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Competing interest statement: H.O.W. holds a funded grant as principal investigator from the second competition described in the paper. J.H. is employed by the Canadian Institutes of Health Research. C.T. is a Scientific Institute director at Canadian Institutes of Health Research and is therefore partially employed by the Canadian Institutes of Health Research.

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1To whom correspondence may be addressed. Email: cara.tannenbaum@umontreal.ca.

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important step toward better and fairer systems. We share four observations.

First, quality should not be sacrificed for speed. In the rush to launch the first COVID-19 funding opportunity in February 2020, short timelines may have created a disadvantage for individuals with caregiving, community, teaching, or self-care responsibilities. Allowing more time in the second competition in April and May 2020 facilitated more applications, despite disruptions to applicants’ laboratories and lives. Although the differences seen are observational and might be attributable to factors other than the gender policy interventions that were implemented, there is reason to believe that extra time can lead to improvements in the number of female applicants and the success of their applications.

Second, implementing changes after discovering a problem is good, but it would be better to prevent problems in the first place. Because of the imbalance between male and female PIs in the first competition, the overall balance across both competitions remains out of proportion compared to historical funding patterns. This may show up in productivity differences in the years to come and will need to be accounted for in evaluations of researchers.

Third, the changes implemented by CIHR appeared to primarily solve problems related to applicants’ sex and gender. Barriers related to other identity dimensions (race and ethnicity, Indigenous identity, disability) require further analysis and consultation to identify solutions. Doing so is crucial to ensure that publicly funded research is allocated fairly and in a way that equitably serves all.

Fourth, educational support and explicit evaluation criteria related to sex, gender, and other identity characteristics may help ensure that applicants and peer reviewers attend to these factors within the proposed research, thereby expanding definitions of research excellence. Such methodological rigor promotes high-quality, relevant, and impactful science that benefits everyone (15).

**Materials and Methods**

We compared two outcomes. First, we examined application and success rates for grants submitted by PIs with different identity characteristics. Second, we examined whether PIs indicated that their grants accounted for sex and gender, in the web-based application form. We used grants management data routinely collected when applicants and peer reviewers create accounts in the online CIHR system and self-identify as female or male, or do not provide an entry in that field. These data were available for 100% of PIs in this study across both competitions and therefore constituted the primary

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**Table 1. Female application pressure and success rates before and after gender policy changes to the roll out of two COVID-19 funding opportunities**

<table>
<thead>
<tr>
<th></th>
<th>Proportion of total applications submitted, %</th>
<th>Proportion of applications funded, %</th>
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<tr>
<td></td>
<td>Female PI</td>
<td>Male PI</td>
</tr>
<tr>
<td>Investigator-initiated open competition</td>
<td>36 (n = 790)</td>
<td>64 (n = 1392)</td>
</tr>
<tr>
<td>First COVID-19 competition</td>
<td>29 (n = 65)</td>
<td>70 (n = 159)</td>
</tr>
<tr>
<td>Second COVID-19 competition</td>
<td>39 (n = 586)</td>
<td>60 (n = 898)</td>
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Percentages do not always add up to 100, as ≤2% of applicants for each competition did not provide an entry in the female/male field.

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**Fig. 1.** Integration of sex and gender within the research content of COVID-19 grant applications. Proportion of submitted and funded applications that addressed sex or gender considerations in the content of COVID-19 grant proposals during the first and second competitions. A breakdown of the submitted grants by COVID-19 research area is provided under the graph.
data for our analyses. Additional data on self-reported gender (woman; man; gender fluid, nonbinary, and/or Two-Spirit) and whether or not the person identifies as an Indigenous person (First Nations, Métis, or Inuit), as a member of a visible minority group, or as a person with a disability were collected from a new self-identity form introduced by CIHR in 2018. The form includes the option, “I prefer not to answer,” for all questions. We compared data from the two COVID competitions to data from the most recent cycle of CIHR’s largest investigator-initiated open competition, as a reference point. We conducted descriptive statistics and logistic regressions to determine the effect of integrating sex and gender on the receipt of a grant, with SPSS, version 26.

Ethics Approval and Consent to Participate. The views expressed in this paper are those of the authors and do not necessarily reflect those of the CIHR or the Government of Canada. Data were held internally and analyzed by staff at the CIHR within their mandate as a national funding agency. Research and analytical studies at the CIHR fall under the Canadian Tri-Council policy statement 2: Ethical conduct for research involving humans (16). This study had the objective of evaluating CIHR’s investigator-initiated programs, and thus fell under Article 2.5 of TCPS-2 and not within the scope of Research Ethics Board review in Canada, so was deemed exempt. Nevertheless, applicants were informed, through ResearchNet, in advance of peer review, that CIHR would be evaluating its own processes. All applicants provided their electronic consent; no applicant refused to provide consent.

Data Availability. The data are housed at CIHR, due to privacy concerns for applicants. Researchers interested in addressing research questions related to grant funding may contact CIHR at Funding-Analytics@cihr-irsc.gc.ca. Additional analyses may be found at https://doi.org/10.1101/2020.10.26.355206.

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