

GLOBAL CALL TO ACTION FOR MOTHERS IN SCIENCE

ACTION PLAN FOR FUNDING AGENCIES 2023



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Created by



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REPORT TEAM

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Suggested citation: Torres, I. L., Collins, N., Ugwu, D., & Hertz, A. (2023) *Global Call to Action for Mothers in Science: Action Plan for Funding Agencies 2023*. Mothers in Science.



About Mothers in Science:

Mothers in Science is an international non-profit organization that advocates for mothers and other caregivers in STEMM to increase retention of women in STEMM careers. We amplify the voices of mothers in STEMM and help organizations, employers and decision-makers develop evidence-based policies and interventions to promote equity and inclusion of caregivers. Visit Mothers in Science at: mothersinscience.com

About this report:

Mothers in Science has united individuals and organizations from around the world with a common goal—to call on our leaders for immediate action to support mothers in science and enact policies to eliminate systemic inequities and increase retention of women in STEMM fields. We have created an action plan outlining a set of specific and actionable strategies to promote inclusion of caregivers and close the gender gap in research funding. For more information about these policies, please read our manuscript: Torres et al., 2023.

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GLOBAL CALL TO ACTION FOR MOTHERS IN SCIENCE

ACTION PLAN FOR RESEARCH FUNDING AGENCIES

Research by Mothers in Science (MiS) and partners has found that over a third of women globally leave full-time STEMM (science, technology, engineering, mathematics and medicine) employment after having or adopting a child (Sugrue et al., unpublished). In the United States, nearly half of new mothers leave full-time STEMM employment within a few years of becoming a parent (Cech and Blair-Loy, 2019). Thus, systemic barriers related to motherhood—collectively known as the 'maternal wall'—provide a critical mechanism driving the so-called leaky STEMM pipeline and ultimately contribute to the underrepresentation of women in STEMM leadership positions (Williams, 2005; Shannon et al., 2019). Alarming, the COVID-19 pandemic has exacerbated these inequities and reversed decades of progress to close the gender gap in STEMM, with potential long-term adverse effects on the careers of female scientists, especially early career researchers with family responsibilities (Gao et al., 2021). The STEMM sector must increase efforts to retain mothers and other caregivers, and funding agencies play a crucial role in this process, as access to research funding is fundamental for scientific production and career advancement. Growing evidence shows that women have lower success rates in research funding due to gender bias (Besselaar et al., 2018; Witteman et al., 2019; Wijnen et al., 2021), highlighting the urgent need for action. Our research (Sugrue et al. unpublished) has identified multiple structural barriers to the career advancement of mothers studying or working in the STEMM sector:

- Alarming levels of maternity bias and discrimination
- Workplace exclusion and fewer professional opportunities
- Widespread parental leave stigma
- Lack of support and professional isolation

Closing the gender gap in research funding is essential to retain women in the academic career pipeline, and therefore to promote research excellence and scientific progress. Funding agencies must implement policies to eliminate unconscious bias in the evaluation process and to ensure an equitable distribution of research funding resources.

REFERENCES

- Cech, E. A. & Blair-Loy, M. (2019) The changing career trajectories of new parents in STEM. *Proceedings of the National Academy of Sciences*, vol. 116(10), pages 4182-4187.
- Williams, J.C. (2005) The glass ceiling and the maternal wall in academia. *New Directions for Higher Education- Wiley Periodicals*, vol. 230.
- Shannon, G., Jansen, M., Williams, K., Cáceres, C., Motta, A., Odhiambo, A., Eleveld, A. & Mannell, J. (2019) Gender equality in science, medicine and global health: where are we and why does it matter?. *The Lancet*, vol. 393(10171), pages 560-569.
- Gao, J., Yin, Y., Myers, K. R., Lakhani, K. R. & Wang, D. (2021) Potentially long-lasting effects of the pandemic on scientists. *Nature Communications*, vol. 12(6188).
- Wijnen, M. N., Massen, J. J. M. & Kret, M. E. (2021) Gender bias in the allocation of student grants. *Scientometrics*, vol. 126, pages 5477-5488.
- Witteman, H. O., Hendricks, M., Straus, S. & Tannenbaum, C. (2019) Are gender gaps due to evaluations of the applicant or the science? A natural experiments at a national funding agency. *The Lancet*, vol. 393(10171) pages 531-540.
- Basselaar, P. van den, Schiffbaenker, H., Sandtrom, U. & Mom, M. (2018) Explaining gender bias in ERC grant selection- Life Sciences care. *STI 2018 Conference Proceedings*, pages 346-352.

WE CALL ON FUNDING AGENCIES TO TAKE THE FOLLOWING ACTIONS:

1 Provide financial support to ensure research continuity

- Scholarships, fellowships and research grants should offer paid parental leave with a minimum duration of 16 weeks for both mothers and fathers, extendable beyond the official termination date of the award, including salaries of staff hired on grant.¹
- Provide flexible funding to hire technical support to conduct research or field work during pregnancy, parental, caregiving or medical leave (including for miscarriage or fertility treatment), with a minimum of 6 months for mothers for postnatal period.²
- Provide flexible childcare subsidies³ and supplements to conference travel grants⁴ to award recipients who are parents; double supplements for single parents.
- Provide re-entry scholarships, fellowships and research grants to researchers who had a prolonged career break due to parental, caregiving or medical leave.⁵

2 Provide flexibility to parents and caregivers

- Provide extensions to grant eligibility criteria (including age limit requirements)⁶ and to track-record assessment period,⁷ to researchers taking parental, caregiving or medical leave, calculated proportionally to the duration of the leave (with a minimum of 18 months per birth for mothers).
- Allow deferments to award start dates⁸ and provide grant extensions for prolonged parental, caregiving or medical leaves.
- Support flexible/remote working by default and allow part-time work up to one year after the birth or adoption of a child, for both mothers and fathers.⁹
- Provide flexible interview scheduling for applicants and allow virtual interviews.

3 Eliminate bias and discrimination

- Require applicant research institutions to implement a Gender Equality Plan (GEP) with specific actions to promote inclusion of mothers and caregivers (eg. monitoring and publishing of parental/caregiving data, compulsory pregnancy/maternity bias training for leaders and staff, default flexible working, paid parental leave policies).¹⁰
- Be explicit about gender/maternity bias in reviewer guidelines and strengthen their language (eg. include excerpts from relevant anti-discrimination laws).¹¹ Reviewers and selection panel members should attend gender/maternity bias training.¹²
- Applicant research institutions should disclose whether the principal investigator (PI), or any of the co-applicants, is under investigation or has previously received a disciplinary warning or active sanctions for an allegation of discrimination or harassment. Applications from PIs who received such sanctions should be rejected. Funding to award recipients under investigation should be immediately removed if the allegation is upheld and sanctions are imposed during the period of the award.¹³
- Establish an anonymous online reporting system to allow award recipients to safely report any type of misconduct, discrimination or harassment perpetrated by their supervisor(s) or research institution(s). Complaints should be quickly investigated by an independent committee.¹⁴
- Monitor success rates (awards/applicants) for women and men, with or without children. Conduct similar analyses for grant funding amounts (allocated/requested).¹⁵
- Implement gender quotas to correct gender bias, encourage women to apply, and increase women's representation until gender parity is reached and bias eliminated.¹⁶

4 Simplify grant applications and reform the evaluation process

- Application procedures should be simplified to reduce the administrative burden of applicants and reviewers and thus facilitate and accelerate the evaluation process.¹⁷
- A simple, transparent and quantifiable evaluation process with clear guidelines for reviewers should be implemented. Applicants should have access to all reviewers' marks and comments, and should be allowed to appeal the funding decision. Complaints should be quickly investigated by an independent committee.¹⁸
- Non-research roles and achievements should be evaluated in a measurable way, in addition to publication record (eg. teaching/mentoring, science outreach, promoting equity, diversity and inclusion (EDI), academic committees, peer review).¹⁹
- Promote gender parity and diversity in reviewer and selection panels²⁰ and actively encourage women to apply for awards (eg. provide grants only for women).²¹
- Applicants should be allowed to explain career gaps and delays in publications due to personal reasons, including parental, caregiving or medical leave, and reviewers should consider (and mention) these justifications in the applicant's evaluation.²²

5 Measure and monitor diversity and inclusion

- Sex/gender and parental/caregiving disaggregated data (i.e. number/age of children, duration of parental/caregiving leave, single/co-parent) on scholarships, fellowships and research grant applicants and recipients should be collected at every cycle of funding. Annual reports should be made publicly available.²³
- Policies should be quickly adapted and/or implemented to eliminate inequalities detected in these surveys and to increase diversity and inclusiveness.²⁴

6 Implement support for COVID-19 impact

- Extend duration of scholarships, fellowships and research grants, including funding for students and technical staff hired on grant, by at least two years to mothers, single parents and caregivers affected by the COVID-19 pandemic.²⁵
- Extend grant eligibility criteria (including age limit requirements), and track-record assessment period, by at least three years to mothers, single parents or caregivers affected by the COVID-19 pandemic.
- Provide re-entry scholarships, fellowships and research grants for parents and caregivers who had to take a career break due to the COVID-19 pandemic.

1 in 3

women say their **competence has been questioned** by their employers and colleagues since becoming a parent.

Women are **3 times** more likely than men to say they have been offered **fewer professional opportunities** since becoming a parent.

34% of mothers globally leave full-time STEMM employment after becoming a parent.

EXAMPLES OF GOOD PRACTICE:

- 1 Natural Sciences and Engineering Research Council of Canada (Canada) postdoctoral fellowships provide up to 12 months of paid parental leave for mothers and fathers, extendable beyond the termination date of the award. [\[LINK\]](#)

Max Weber Fellowships (Italy) provide up to 16 weeks of paid maternity leave, extendable beyond the termination date of award. [\[LINK\]](#)

Wellcome Trust (UK) research grants include supplements to cover research costs and salaries of award recipient and of staff hired on grant for the duration of parental leave. [\[LINK\]](#)

- 2 National Institutes of Health (USA) provide supplements to postdoc fellowships and research grants to cover research expenses and hiring of additional scientific staff during pregnancy and parental leave of award recipient. [\[LINK\]](#)

National Science Foundation (USA) offers supplements to hire a technician or research assistant during official parental leave of award recipient (PIs, postdocs or graduate students). [\[LINK\]](#)

German Research Council (Germany) provides supplements to postdoc fellowships and research grants to cover research expenses during pregnancy or parental leave of award recipient, including hiring additional academic or student staff. [\[LINK\]](#)

- 3 National Institutes of Health (USA) provides childcare support (\$2,500) to NRSA graduate and postdoctoral fellows. [\[LINK\]](#)

- 4 National Geographic (USA) offers dependent care assistance during the time away from family to facilitate participation in professional and networking opportunities. [\[LINK\]](#)

National Institutes of Health (USA) provides supplements to conference grants to cover childcare costs at the conference site to allow award recipients to attend conferences. [\[LINK\]](#)

Wellcome Trust (UK) covers childcare costs of up to £1000 per person to allow award recipients, or any staff employed on their grant, to attend conferences. [\[LINK\]](#)

- 5 Daphne Jackson Trust (UK) provides postdoctoral fellowships to researchers returning to careers after a prolonged break for family, caregiving or health reasons. [\[LINK\]](#)

British Heart Foundation (UK) offers research fellowships of four years (extendable by one year) to postdoctoral researchers wanting to re-establish their career after a prolonged break. [\[LINK\]](#)

American Physical Society (Canada and USA) offers postdoctoral research grants to women wanting to re-establish their research career in physics after a prolonged career break. [\[LINK\]](#)

- 6 National Institutes of Health (USA) provides extensions to Early Stage Investigator eligibility to researchers who have experienced a career break for parental, caregiving, medical, disability or military service leave. [\[LINK\]](#)

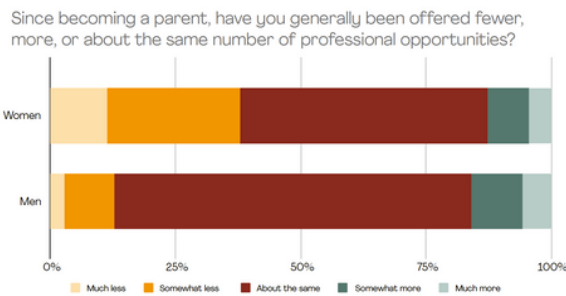
European Research Council (EU) offers extensions to eligibility for Starting, Consolidator and Advanced grants due to maternity leave (18 months or more upon justification), paternity leave (equal to duration of paternity leave) or long-term illness. [\[LINK\]](#)

Dutch Research Council (Netherlands) offers extensions to eligibility for Talent Scheme grants due to maternity leave (18 months), paternity leave (6 months), caregiving or long-term illness. [\[LINK\]](#)

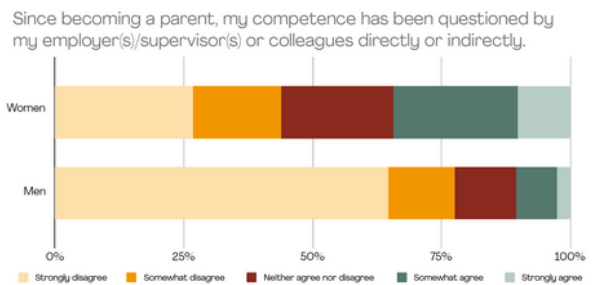
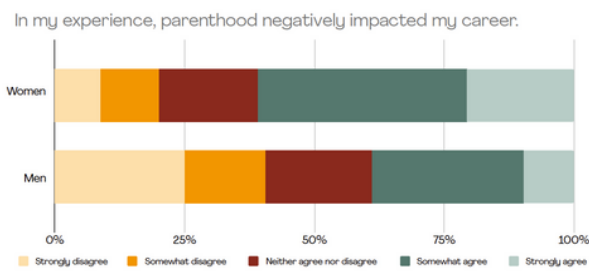
- 7 FAPERGS - Foundation for Support to Research in the State of Rion Grande do Sul (Brazil) provides one-year extensions to track-record assessment period for each maternity or adoption leave, regardless of their duration, for fellowships and scholarships. [\[LINK, Portuguese\]](#)

- 8** Natural Sciences and Engineering Research Council of Canada (Canada) allows the deferment of grant start dates due to parental, caregiving or medical reasons for up to 3 years. [\[LINK\]](#)
- 9** Wellcome Trust (UK) allows award recipients to request flexible and part-time working, and accommodates these requests on a case-by-case basis. [\[LINK\]](#)
UK Research and Innovation (UK) allows award recipients to apply for flexible and part-time working to combine research with personal responsibilities. [\[LINK\]](#)
- 10** Having a Gender Equality Plan (GEP) is now an eligibility criterion for all academic institutions and research organisations applying to research funding from the European Commission. [\[LINK\]](#)
- 11** Albiston et al. (2012) showed in a laboratory experiment that when discrimination laws (Family and Medical Leave Act, US) were explicit in reviewer guidelines, maternity bias was nearly eliminated in performance evaluations. [\[LINK\]](#)
- 12** Banting Postdoctoral fellowship (Canada) provides resources and strongly encourages reviewers to complete an unconscious bias online training module offered by the agency. [\[LINK\]](#)
- 13** Wellcome Trust (UK) requires applicants to disclose whether they received previous sanctions for harassment or misconduct allegations, including discrimination, in which case they are disqualified. Sanctions may be applied to award recipients who break the agency's "Bullying and Harassment Policy", eg. removal of funding and restriction from future applications. [\[LINK\]](#)
- 14** University of Cambridge (UK) has an online system for any student, staff or visitor to the University, to "anonymously report inappropriate behaviour from staff, students or members of the community, including harassment, bullying, discrimination and sexual misconduct". [\[LINK\]](#)
- 15** Natural Sciences and Engineering Research Council of Canada (Canada) produces reports with success rates (number awards/number applicants) of female and male applicants. [\[LINK\]](#), page 64
- 16** National Health Medical Research Council (Australia) introduced gender quotas to their Leadership grants to achieve equal numbers of awards between men and women/non-binary people. [\[LINK\]](#)
- 17** Australian Centre for Health Services Innovation (Australia) shortened grant applications to a 1200-word proposal focused on the research project, leading to a drastic decrease in peer-review and application preparation time without compromising research excellence. [\[LINK\]](#)
- 18** Fond National de la Recherche Scientifique (Belgium) provides evaluation report to applicants. [\[LINK\]](#)
Natural Sciences and Engineering Research Council of Canada (Canada) allows applicants to appeal the funding decision. Appeals are normally resolved within three months. [\[LINK\]](#)
- 19** Natural Sciences and Engineering Research Council of Canada (Canada) has specific guidelines for assessing applicants' non-research contributions, such as outreach, EDI and mentoring. [\[LINK\]](#)
L'Oréal-UNESCO For Women in Science Research Excellence Fellowships considers extra-curricular activities or volunteer experience demonstrating a "commitment to supporting women in science" as an important evaluation criterion. [\[LINK\]](#)
- 20** Research Foundation-Flanders (Belgium) ensures that a maximum of two-thirds of the expert panel members are of the same gender to reduce gender bias in the evaluation process. [\[LINK\]](#)

- 21 Swiss National Science Foundation (Switzerland) awards grants covering salary and research costs for five years to women researchers with a high potential for obtaining a professorship. [\[LINK\]](#)
- 22 Natural Sciences and Engineering Research Council of Canada (Canada) allows applicants to explain possible delays in career and/or productivity due to health, family responsibilities, parental leave, disabilities, trauma and loss, among others. [\[LINK\]](#)
National Institutes of Health (USA) allows applicants to explain factors affecting past productivity, such as family care responsibilities, illness, disability, or military service. [\[LINK\]](#)
- 23 Innovate UK (UK) collects equality, diversity and inclusion (EDI) data on all their competitions. [\[LINK\]](#)
- 24 Innovate UK (UK) commits to review their structures, processes and work environments and the ways that may be perpetuating barriers, according to the data collected on EDI. [\[LINK\]](#)
- 25 Natural Sciences and Engineering Research Council of Canada (Canada) provided all eligible active Discovery Grant recipients a one-time one-year extension with funds at their current funding level to "lessen the impact of COVID-19". [\[LINK\]](#)



Over 60% of women studying or working in the STEM sector say that parenthood negatively impacted their career.



DATA

The data shown were collected in a survey conducted by Mothers in Science between September 15th and December 31st, 2020, to study the situation of parents studying or working in the STEM sector. All responses correspond to the participants' situation prior to the COVID-19 pandemic. Responses are based on self-report. A total of 8,930 participants, including mothers, fathers and non-parents, completed the survey. The study includes participants from 128 countries, although the USA, France, UK, Germany and Australia are overrepresented. As expected, women are also overrepresented, which can be common in surveys related to women and caregiving issues. The survey was designed and conducted by Mothers in Science and distributed in partnership with INWES, 500 Women Scientists, Femmes & Sciences, Parent in Science and Washington University St Louis. The data were analysed by Victoria Sugrue (MiS and University of Otago), Mira Rahal (Laboratoire d'Economie de Paris), Adeline Samson (University of Grenoble), Elise Arnaud (University of Toulouse), Anaëlle Hertz (University of Toronto), Saga Pardede (University of Agder), Nikkita Collins (Boston University School of Medicine) and Isabel Torres* (Mothers in Science).

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