

Why Sex and Gender Need to be Considered in COVID-19 Research

A Guide for Applicants and Peer Reviewers

First, sex-disaggregated data reveal that more males are dying from COVID-19 than females¹. It remains unclear if biological factors and/or comorbid, occupational, behavioural or institutional factors are to blame.

Second, pandemics can compound differential exposures and outcomes for girls, women, sexual and gender minorities, caregivers and other essential workers involved in gendered occupations. It is essential that these populations are considered through an intersectional lens in order to create effective, equitable policies and interventions.

Applicants and peer reviewers should appropriately account for the following in COVID-19 research proposals:



Molecular Mechanisms of Viral Pathogenesis

- Include both male and female cells, as the SARS-CoV-2 receptor, ACE2, is X-linked and escapes X chromosome inactivation². Disaggregate results by sex.



Host Immune Response

- Include male and female animals or humans, as sex differences in the host immune response to SARS-CoV³ and SARS-CoV-2⁴ infections have been reported. Disaggregate results by sex.



Diagnostic Tests and Serologic Antibody Testing

- Measure sensitivity and specificity for males and females separately, as sex differences in viral titers and IgG antibodies have been reported for SARS-CoV and SARS-CoV-2 infections in humans and mice^{3,5}.



Vaccines and Therapeutics

- Test and report sex-specific dosing of vaccines and other therapeutics. Efficacy, safety and toxicity for males and females differ for some drugs⁶, immunotherapies⁷ and vaccines⁸.



Clinical Trials

- Stratify randomization by sex, age and race, as these variables influence the safety and efficacy of drugs and biologics⁹. Disaggregate results by sex, age and race.



Medical Devices and Personal Protective Equipment

- Incorporate sex-specific anatomical differences and gendered user preferences into the design of medical devices and personal protective equipment for COVID-19.



Social, Behavioural Observational and Seroprevalence Studies

- Consider sex, gender, age, race, Indigeneity and other identity characteristics in survey questions and sampling strategies.



In studies of disease susceptibility, investigate:

- 1) Gendered behaviours, as men are more likely to smoke than women¹⁰ and less likely to seek healthcare¹¹, whereas older women are more likely to live alone and experience social isolation.
- 2) Gender roles, as 70% of the paid and unpaid global healthcare workforce are women¹². The risk of exposure increases for those on the frontline of the COVID-19 pandemic.

In research on the impact of the pandemic, investigate:

- 1) Gender relations, as physical distancing puts women and girls at higher risk of domestic violence¹³, while transgender and non-binary individuals are at higher risk of feeling unsafe due to heightened tensions and unsupportive environments in the household¹⁴.
- 2) Gender roles, as women disproportionately assume caregiving responsibilities. Lockdown measures and school closures have caused negative impacts on women's wellbeing¹⁵.

Mental Health

- Mental health effects vary by sex, gender, sexual orientation and other identity characteristics, as the triggers, causes, signs and symptoms of depression and anxiety may differ¹⁶.



Implementation Science

- Sex, gender, age, immigrant, occupational and racialized community identities influence the way in which an implementation strategy works, for whom, under what circumstances and why. Consider how messaging should appropriately include and target different communities according to sex, gender and other identity characteristics¹⁷.



Policy

- The unintended outcomes of all COVID-19 policies, especially economic recovery policies, should be considered for groups such as Indigenous Peoples, women, sexual and gender minorities, racialized individuals, single parents, immigrants, unpaid workers, individuals with precarious work status, people with disabilities, the homeless and those living in rural and remote areas¹⁸.



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