

# COVID-19 mortality rates higher among men than women

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A new review article from Beth Israel Deaconess Medical Center (BIDMC) shows people who are biologically male are dying from COVID-19 at a higher rate than people who are biologically female. In a review published in *Frontiers in Immunology*, researcher-clinicians at

BIDMC explore the sex-based physiological differences that may affect risk and susceptibility to COVID-19, the course and clinical outcomes of the disease and response to vaccines.

"The COVID-19 pandemic has revealed a striking gender bias with increased mortality rates in men compared with women across the lifespan," said corresponding author Vaishali R. Moulton, MD, Ph.D., an assistant professor of medicine in the Division of Rheumatology and Clinical Immunology at BIDMC. "Apart from behavioral and [lifestyle factors](#) that differ between men and women, [sex chromosome](#)-linked genes, [sex hormones](#) and the microbiome control aspects of the immune responses to infection and are potentially important biological contributors to the sex-based differences we're seeing in men and women in the context of COVID-19."

Moulton and co-authors Nirupa Gadi, Samantha C. Wu and Allison P. Spihlman, all medical students in Moulton's laboratory at BIDMC, acknowledge that demographic differences between men and women predispose each group to risk in different ways. Men, for example, are more likely to smoke cigarettes, a known risk factor for severe COVID-19, and are more likely to have cardiovascular disease and hypertension, important underlying comorbidities in COVID-19; while women are more likely to hold jobs in health care, increasing their potential exposure to the virus.

Nonetheless, many animal and [human studies](#) demonstrate that females tend to mount stronger immune responses to infections than males, a trait that may be linked to increased susceptibility to inflammatory and autoimmune diseases. Reviewing the [scientific literature](#) regarding sex-based differences in cells of the immune system, X chromosome-linked genetics, sex hormones, the ACE-2 receptor and the microbiome, the scientists conclude that sex is a crucial yet understudied and often overlooked variable in research related to immunity and infectious

disease.

"Vaccine-related research and clinical trials, including those currently underway for COVID-19, must include sex as a key variable when measuring and reporting outcomes," said Moulton, who is also an assistant professor of medicine at Harvard Medical School.

"Understanding these factors will both help us better understand COVID-19 and guide the design of effective therapies and vaccine strategies towards sex-based personalized medicine moving forward."

**More information:** Nirupa Gadi et al, What's Sex Got to Do With COVID-19? Gender-Based Differences in the Host Immune Response to Coronaviruses, *Frontiers in Immunology* (2020). [DOI: 10.3389/fimmu.2020.02147](https://doi.org/10.3389/fimmu.2020.02147)

Provided by Beth Israel Deaconess Medical Center

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