

# Why are women less affected with COVID-19 as compared to men?

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In news

A study found that the human enzyme ACE2 is offering protection to women against Covid-19 disease.

## Key highlights of the study

- The new study has found that human enzyme ACE2 which enables the novel coronavirus to infect the cell, is also key in protecting against cardiovascular, lung and kidney diseases may be offering protection to women against Covid-19 disease.
- The study has looked at why female COVID-19 patients face less severe disease complications and a lower risk of dying than male patients, and found that it is thanks to hormones and chromosomes that contribute to a stronger immune response.
- The highlight of the study is how the sex differences in Covid-19 are linked to ACE2.
- Because of their chromosomes, women have two copies of the ACE2 gene and men have only one copy.
- This does not seem to make women more susceptible to Covid-19 infection, the research found, it rather protects them from the complications associated with the virus.
- ACE2 is a gene linked to the X chromosome. And women have twice as many active genetic instructions to make ACE2

- **Chromosomes in human body**

- A chromosome is an organized package of DNA found in the nucleus of the cell. Different organisms have different numbers of chromosomes
- A **chromosome** is a long DNA molecule with part or all of the genetic material of an organism.
- Humans have 23 pairs of chromosomes, 22 pairs of numbered chromosomes, called autosomes, and one pair of sex chromosomes, X and Y.
- Each parent contributes one chromosome to each pair so that offspring get half of their chromosomes from their mother and half from their father.

- Research is underway to understand how manipulating ACE2 levels might help Covid-19 patients, to prevent infection by blocking the enzyme, or to protect the body by enhancing it.
- The study was led by researchers at University of Alberta.
- It is published in the American Journal of Physiology-Heart and Circulatory Physiology.

### **About human enzyme Angiotensin-converting enzyme 2 (ACE2)**

- ACE2 is an enzyme attached to the cell membranes of cells located in the lungs, arteries, heart, kidney, and intestines
- ACE2 is known to be expressed in various human organs, and its organ- and cell-specific expression suggests that it may play a role in the regulation of cardiovascular and renal function, as well as fertility.
- In addition, the encoded protein is a functional receptor for the spike glycoprotein of the human coronavirus HCoV-NL63 and the human severe acute respiratory syndrome coronaviruses, SARS-CoV and SARS-CoV-2, the latter is the causative agent of COVID-19.
- Multiple splice variants have been found for this gene

and the dACE2 (or MIRb-ACE2) splice variant has been found to be interferon inducible.