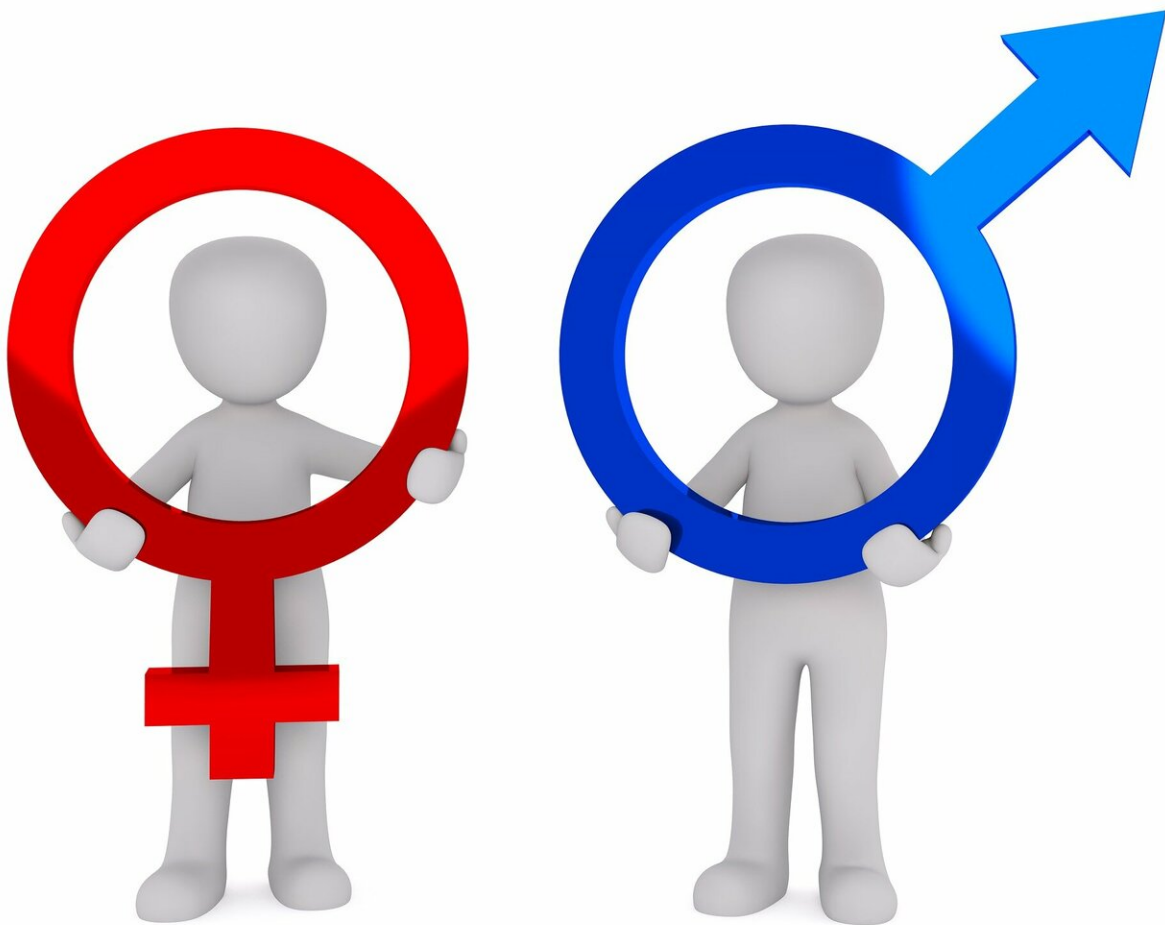


# Health research overlooks important differences between sexes

April 21 2022, by Erik Rolfsen

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You might be surprised to learn how rarely health research accounts for the fact that male and female bodies are different.

Researchers from UBC's [women's](#) health research cluster and department of psychology have published an analysis of 3,193 neuroscience and psychiatry studies from 2009 and 2019. They found that:

- Only 53 percent of the studies included both males and females.
- Only 17 percent used a balanced ratio of males and females throughout the study.
- Only four percent used best practices for discovering possible differences between sexes.

We spoke with Dr. Liisa Galea, professor in the department of psychology and lead of the women's health research cluster, about the findings published this week in *Nature Communications*.

## **What motivated this study?**

"A recent study found that women are diagnosed on average two years later than men for the same diseases. We know that women are more likely to live longer than men, but they are also more likely to suffer from chronic disease and side effects from new drugs."

"The major funding agencies for [health research](#) in the U.S. and Canada have worked hard to correct these disparities by mandating inclusion of females, girls and women in preclinical and clinical work, starting in the early 1990s. Yet still disparities are seen across a wide variety of

diseases."

"We suspected that researchers were using both sexes in studies, but not in the most optimal way for discovering whether there were possible differences between sexes."

## **What do you mean by 'optimal'?**

"The No. 1 thing is to have males and females in the study. The second thing is that it's balanced, with relatively equal representation throughout the study. And the third thing is that you actually have to analyze the data by sex."

"The majority of studies in our sample did not analyze the data with sex as a factor. Of the studies that did, most of the studies thought of sex as a 'nuisance' variable and used it as a covariate, which is a way of removing the effect of sex. That's a problem, because you're simply removing the variable rather than looking at whether it made a difference."

"The only way to discover sex differences is by using sex as what we call a 'discovery variable.' Only four percent of the total papers we analyzed had done this."

## **What are the consequences of this?**

"When researchers look for sex differences, they often find differences in risk for disease or prevalence of disease. For example, women are more than twice as likely to be diagnosed with depression. Men are more likely to be diagnosed with [coronary heart disease](#). But it's not just how many men and women are getting a disease—diseases also manifest differently between men and women or males and females."

## How so?

"Symptoms can be very different. Men might feel [chest pain](#) when they have a heart attack. Women are more likely to just feel sick. So women who show up at an [emergency department](#) with heart attack symptoms might not be diagnosed with a heart attack. Instead they're sent home. This can cost lives."

"This has also occurred with COVID-19 vaccines. Initial clinical trials did not use pregnant people. They also didn't record any possible effects post-vaccine that would affect men and women differently such as a menstrual cycle disturbance. When women started reporting this on [social media](#), it caused confusion, misinformation and likely contributed to some vaccine hesitancy."

## Can the failure to look for sex differences be a problem for both sexes?

"There's another good example of why you need both males and females in clinical trials. Lazaroids are therapeutic drugs that can help limit damage from a stroke. It turns out they are very effective in males but not in females, which you wouldn't discover if you didn't analyze for sex differences. There's nothing wrong with having a really good medication that's going to help around half the population. Then you figure out what will help the other half. That's what we miss when we ignore the power of sex differences."

**More information:** Rebecca K. Rechlin et al, An analysis of neuroscience and psychiatry papers published from 2009 and 2019 outlines opportunities for increasing discovery of sex differences, *Nature Communications* (2022). [DOI: 10.1038/s41467-022-29903-3](https://doi.org/10.1038/s41467-022-29903-3)

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