

# Largest, most diverse ever study of prostate cancer genetics brings disparities into focus

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Micrograph showing prostatic acinar adenocarcinoma (the most common form of prostate cancer) Credit: Wikipedia, [CC BY-SA 3.0](https://creativecommons.org/licenses/by-sa/3.0/)

Some racial and ethnic groups suffer relatively more often, and fare worse, from common ailments compared to others. Prostate cancer is one disease where such health disparities occur: risk for the disease is about 75 percent higher, and prostate cancer is more than twice as deadly, in Blacks compared to whites. Yet whites are often overrepresented as research participants, making these differences

difficult to understand and, ultimately, address.

With this problem in mind, scientists at the USC Center for Genetic Epidemiology and the Institute for Cancer Research, London, led a study that brings together data from the majority of genomic [prostate cancer](#) studies globally. Including more than 200,000 men of European, African, Asian and Hispanic ancestry from around the world, the study is the largest, most diverse genetic analysis ever conducted for [prostate cancer](#)—and possibly for any other cancer.

The paper appears today in *Nature Genetics*.

The study's authors identified 86 new genetic variations that increase risk for prostate cancer, not previously discovered, bringing the total number of risk loci for prostate cancer to 269. Applying a model for assessing prostate cancer risk based on the interplay of these genetic factors, the researchers showed that men of African ancestry inherit about twice the prostate cancer risk on average compared to men of European ancestry, while men of Asian ancestry inherit about three-quarter the risk of their white counterparts—evidence that genetics play some part in the differences in how often cancer occurs in different racial groups.

This research is also a step toward applying precision medicine to early detection.

"Our long-term objective is to develop a genetic risk score that can be used to determine a man's risk of developing prostate cancer," said corresponding author Christopher Haiman, ScD, professor of preventive medicine at the [Keck School of Medicine of USC](#) and director of the USC Center for Genetic Epidemiology. "Men at higher risk may benefit from earlier and more frequent screening, so the disease can be identified when it's more treatable."

## Study tackles health disparities

Praise for the study's potential in increasing health equity came from Jonathan W. Simons, MD, president and chief executive officer of the Prostate Cancer Foundation. The foundation funds Haiman's other work leading the [RESPOND](#) initiative exploring the disease among African American men.

"PCF believes that Dr. Haiman's research findings will lead to more effective prostate cancer precision screening strategies for men of West African ancestry," Simons said. "PCF is certain that identification of these very high-risk individuals will make a positive impact on this significant health care disparity."

Haiman and his colleagues used genomic datasets from countries including the U.S., the UK, Sweden, Japan, and Ghana to compare 107,247 men with prostate cancer to a control group comprising 127,006 men. By examining a spectrum of races and ethnicities, the study's authors aim to make the genetic risk score more useful for more people.

"We not only found new markers of risk, but also demonstrated that, by combining genetic information across populations, we were able to identify a risk profile that can be applied across populations," said Haiman. "This emphasizes the value of adding multiple racial and ethnic populations into genetic studies."

## Risk score could contribute to better screening

Today's screening guidelines for prostate cancer suggest that those 55 and older with average risk can choose to take the prostate-specific antigen (PSA) test in consultation with their physicians. High PSA levels are associated with prostate cancer, but the PSA test tends to detect slow-

growing tumors. With widespread use, it too often leads to unnecessary treatment.

The PSA test's value as a screening tool would grow if it were deployed selectively to monitor people found to be at high risk for prostate cancer—which is where the genetic risk score could come into play. Those at particularly high risk might even begin screening before age 55.

In order to translate the current research findings into better early detection, a large-scale clinical trial would be needed.

"Most important, unlike previous screening trials, this one would need to be more representative of the diversity we see in the world," Haiman said. "No population should get left behind."

**More information:** Trans-ancestry genome-wide association meta-analysis of prostate cancer identifies new susceptibility loci and informs genetic risk prediction, *Nature Genetics* (2021). [DOI: 10.1038/s41588-020-00748-0](https://doi.org/10.1038/s41588-020-00748-0), [www.nature.com/articles/s41588-020-00748-0](https://www.nature.com/articles/s41588-020-00748-0)

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