

Socio-cultural, genetic data work together to reveal health disparities

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When it comes to health disparities between different groups, how society sees people in terms of race might play a greater role than genetics, according to a new University of Florida study.

The study also showed that taking stock of socio-cultural factors might improve our understanding of how genes influence individual health — regardless of race.

Consider high [blood pressure](#), a complex disease governed both by genetic and environmental factors. Not only was social classification better than genetic-based ancestry at predicting disease status, it also brought to light a link between a particular gene and blood pressure that was not apparent when only genetic ancestry was considered.

The study, to be published Wednesday (Sept. 9) in the journal [PLoS ONE](#), is the first to rigorously combine both socio-cultural and [genetic data](#) to simultaneously test the relative contributions of each to racial inequalities in health.

"What's really groundbreaking is that we've got both types of data and they're of equivalent sophistication," said co-author Connie Mulligan, Ph.D., an associate professor of anthropology and an associate director of the UF Genetics Institute.

The results suggest that previously reported associations between genetic ancestry and health might be accounted for by socio-cultural factors

related to race and racism, and not necessarily to [genetic differences](#) between races. It also suggests that including socio-cultural factors can strengthen genetics studies and help reveal how social inequalities can lead to biological differences.

"We have to take seriously the way race shapes people's experiences, the environments they live in and their life chances," said lead author Clarence C. Gravlee, Ph.D., an assistant professor of anthropology at UF. "In day to day life, people often assume that race exists as biology. Most anthropologists and geneticists reject that idea and see race instead as a cultural construct. The point of our paper is that race is so embedded in our society that it affects biology by shaping the types of environments that people live in."

How social and or genetic factors drive racial inequalities in health and the role of race in genetic and biomedical research are the source of much controversy and study. Some scientists see race as useful for pinpointing gene-based susceptibility to complex diseases, but others caution that looking at race from a purely genetic standpoint can mask social causes of racial inequalities.

"We have to look at these in a way that will allow us to tell the whole story, not from one side or the other," said Jay Kaufman, Ph.D., an associate professor of epidemiology, biostatistics and occupational health at McGill University and author of the upcoming book "Racing in Circles: Myths about Genes and Race in Biomedical Research." Kaufman was not involved in the UF study.

In general, members of racial minorities in the United States suffer poorer health, and more die prematurely compared with their white counterparts. African-Americans are three times more likely than whites to die from high blood pressure, according to the American Heart Association.

"The sheer scale of inequalities in sickness and death deserves our attention," Gravlee said. "Researchers have an obligation to explain the origins of these inequalities and to identify social factors that could be targeted for policy change."

To examine the link between African ancestry and blood pressure, the UF team studied 87 adults in Puerto Rico, using two variables for which "race" is often used as a surrogate: genetic ancestry and social classification.

Genetic ancestry was assessed using gene variants that show large frequency differences among groups from different continents. Social classification was assessed by observers to estimate how people are perceived in everyday life in terms of skin pigmentation, or "color" (pronounced coh-lohr). The researchers found that the three major "color" categories had overlapping genetic ancestry, and that there was a strong link between "color" and blood pressure, but not between genetic ancestry and blood pressure.

Next, they looked at whether taking account of social factors changed our understanding of genes thought to affect hypertension. When only genetic ancestry was considered, no association was evident between candidate genes for hypertension and blood pressure. But when "color" and socio-economic status were included in the analysis, a significant association between the gene variant and blood pressure was uncovered.

"One of the important points here is that you can have an association between two biological variables like [genetic ancestry](#) and blood pressure, but it could be that the social and cultural implications of having African ancestry is what is driving this association," Gravlee said.

Health differences could arise from differing stresses people face based on how society sees and treats them.

"There's no doubt about the fact that perceptions matter," Kaufman said. "This article reinforces the idea that if you don't pay attention to how people are perceived you miss a big chunk of the story."

The researchers found that the group of people who carried the associated genetic variant also contained multiple categories of "color" and socio-economic status. When these different socio-cultural categories were separated, the protective effect of the genetic variant became evident.

"What's exciting about our study, is that we can show the value of including socio-cultural data by revealing a genetic association that would otherwise have been missed," Mulligan said. "This is important in convincing other researchers that it is worthwhile to include nongenetic data in a genetic study rather than simply controlling for nongenetic factors."

Source: University of Florida ([news](#) : [web](#))

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