Artificial Intelligence Could Reduce Racial Bias in Medicine

An algorithm was better than radiologists at assessing the severity of Black patients' osteoarthritic pain, according to a new study.

February 17, 2021 By Caroline Tien

In a study published in the journal Nature Medicine, researchers from Harvard University, Stanford University, the University of Chicago and the University of California, Berkeley, posited that artificial intelligence technology could reduce racial disparities in the treatment of physical pain. Scientists found that algorithmic estimates of osteoarthritic pain intensity were often more accurate than human ones, which was of particular benefit to patients who were people of color, the BBC reports.

Knee osteoarthritis (OA)—localized pain, swelling and stiffness caused by the breakdown of protective articular cartilage—is a common complaint in elderly populations. While the condition's prevalence does not appear to correspond with race or ethnicity—osteoarthritis affects 1 in 10 men and 1 in 13 women over age 60 in the United States—its severity, or perceived severity, does.

People of color score far higher on knee pain scales than white people, according to the inquiry. The source of this disparity has been the subject of much debate in the medical community. Some have attributed it to legitimate differences in disease presentation, but others have attributed it to social and psychological stressors.

Researchers trained their algorithms on 36,369 knee X-rays from a diverse group of 4,172 people who had been diagnosed with or were at high risk for knee osteoarthritis. In addition, they used patients' assessment of their knee pain levels in the algorithms. (Scientists also noted that lower-income and lower-education participants consistently reported feeling more pain overall.)

"We didn't train the algorithm to predict what the doctor was going to say about the X-ray," said Ziad Obermeyer, an assistant professor at UC Berkeley and a study coauthor. "We trained it to predict what the patient was going to say about their own experience of pain in the knee."

Next, scientists compared the pain predictions generated by the algorithm to pain predictions generated by radiologists. The algorithm exhibited a higher degree of accuracy in measuring pain severity apparent in the X-rays that was missed by the radiologists who relied on mainstream pain

classification systems, such as the Kellgren-Lawrence grading scale.

“This suggests that much of underserved patients’ pain stems from factors within the knee not reflected in standard radiographic measures of severity,” the researchers wrote. (But they were unable to determine what those factors were.)

Researchers proposed that the inadequacy of the standard measures may stem from their origin in white British communities in the mid-20th century. However, racial bias in radiology, specifically, and medicine, in general, may also play a role. Previous research has shown that false beliefs about biological differences between Black and white people, such as that Black people have thicker skin, can result in bias in medical assessments of pain intensity.

For more on the disproportionate impact of osteoarthritis on Black people, read “Black Arthritis Patients Less Likely to Get Potent Drugs” and “Blacks Feel Knee and Spine Pain Pinches More Often.” And for more on advances in medicine driven by artificial intelligence technology, read “In the Future, Amazon’s Alexa Could Help Diagnose Medical Conditions” and “AI May Diagnose Health Conditions as Effectively as Health Professionals.”

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