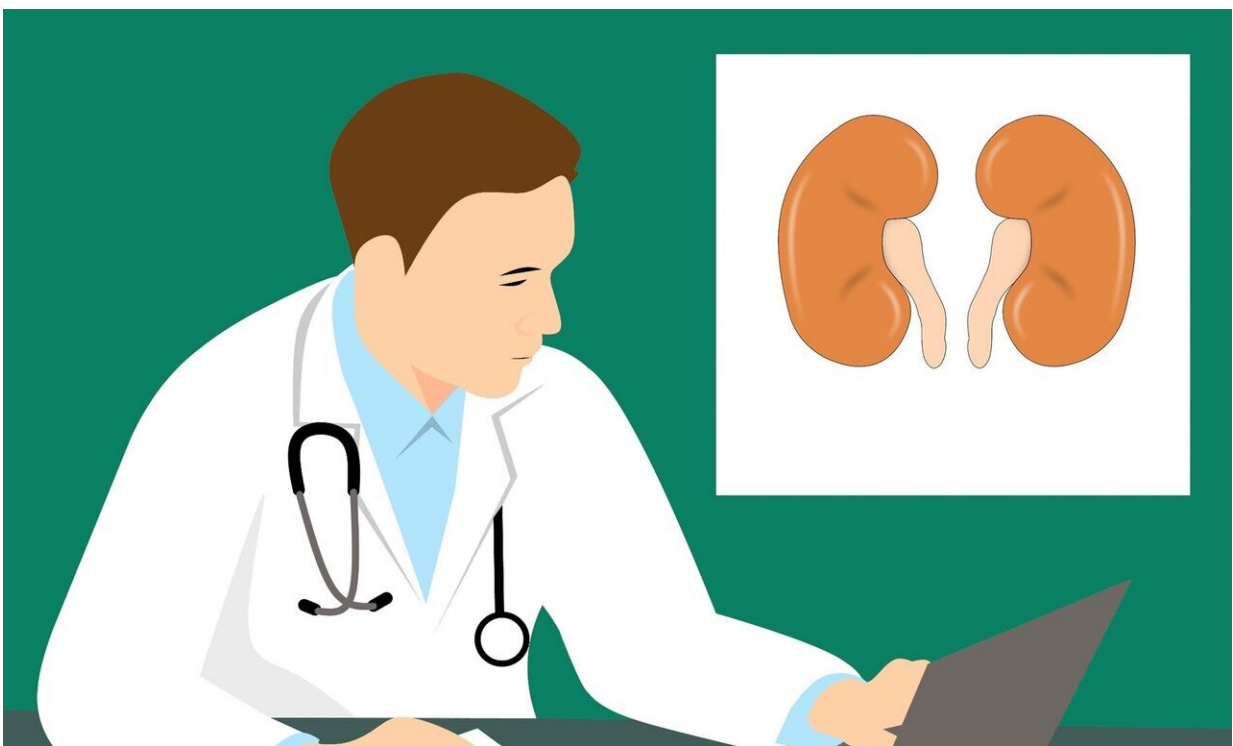


# Study forecasts advantages and disadvantages for Black patients of removing race from kidney function calculators

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Race is not biology. As a social construct, race is an unreliable predictor of physiologic variation and a notoriously unreliable marker for biologic differences across populations.

To reflect this growing realization, hospital systems and professional medical organizations have started reconsidering the use of race in clinical calculators that estimate how well a person's kidneys work. Indeed, some hospital systems have already removed race from these commonly used clinical tools.

But what this move might mean for patients remains unclear.

Now a new study from Harvard Medical School forecasts the effects of this change if implemented nationwide. The results, published Dec. 2 in *JAMA*, suggest that removing race from [kidney](#) function tests might have both advantages and disadvantages for Black people with [kidney disease](#).

The analysis represents the most comprehensive study to date to assess the impact of eliminating race from kidney function formulas. It is intended to help clinicians, healthcare organizations and policymakers understand the implications of such a decision, allocate resources, monitor patients and individualize care. The findings should also help patients understand what the change may mean for them and lead to greater involvement in their own care.

The researchers say that the current way of calculating kidney function by adjusting for race is flawed. However, they also caution any changes must be implemented with full understanding of the possible effects.

"The remnants of race-based medicine well into the 21st century expose a historical legacy of crude approaches to using identity in clinical practice," said study senior investigator Arjun Manrai, an assistant professor of biomedical informatics in the Blavatnik Institute at Harvard Medical School. "We must find better ways to individualize care and removing race from clinical algorithms is an important goal. But we must ensure that in doing so we do not inadvertently harm the very individuals we are trying to protect and care for."

Some of the anticipated benefits of dropping the race adjustment include earlier diagnoses, better access to kidney specialists and specialty services, and better care options. The possible downsides include restricting access and eligibility to medications for cardiovascular problems, diabetes, pain control and cancer or dose adjustments for these drugs.

The researchers say that understanding the potential for both benefit and harm is critical to ensuring that Black patients do not face more health inequity than they already do.

"The social and historical contexts of using race in kidney function tests are vital for understanding the clinical implications of removing this variable from the equation," said study first author James Diao, a third-year medical student at Harvard Medical School. "Our findings must be interpreted in light of significant disparities for Black patients resulting from the long history of racism in medicine, as well as data on the accuracy of kidney function equations in disadvantaged groups."

## **Estimating kidney function**

Directly measuring a person's kidney function is cumbersome, timely and inefficient. To circumvent this hurdle, clinicians use a formula to get a numeric score that estimates how well someone's kidneys are working. The formula is based on measuring the blood levels of creatinine, a waste product removed by the kidneys, and then plugging in variables, including a person's age, sex and race (Black versus White/Other). Lower creatinine levels generally mean that the kidneys are removing creatinine faster from the blood, which signals better kidney function.

## **Why adjust for race to begin with?**

Until the 1990s, the standard formula used to estimate kidney function was derived from research in white males. Then, in the 1990s, researchers noticed that Black individuals had faster kidney filtration rates, even at the same creatinine levels as white individuals of the same age and sex. This led scientists to reason that creatinine levels may be naturally higher in Black individuals without compromised kidney function. To avoid overdiagnosis, the thinking went, the kidney formula needed to factor in race as a more accurate estimate of kidney function.

The solution scientists came up with was to include a statistical "adjustment" to the formula based on a person's self-identified or perceived race.

Why Black people have comparatively higher creatinine levels is not well understood. A popular misconception posits that higher creatinine levels are due to higher muscle mass among Black individuals since muscle releases more creatinine. However, Manrai says, the evidence does not support this hypothesis, which can serve to reinforce racial stereotypes.

"In general, medicine needs better, more precise ways to gauge differences across populations if elements of identity are to be incorporated into care," said Manrai, who is assistant professor of pediatrics and a faculty member in the Computational Health Informatics Program at Boston Children's Hospital.

In their study, the Harvard Medical School team analyzed 18 years' worth of data obtained from more than 9,500 Black participants in the National Health and Nutrition Examination Survey, a program of studies designed to assess the health and nutritional status of adults and children in the United States.

To estimate the number and proportion of Black adults whose care

would change as a result of eliminating the race adjustment from the current formula, the researchers re-calculated participants' kidney function with and without race.

The analysis showed that, if implemented nationally, removing race as a variable from the formula could result in nearly one million new diagnoses of chronic kidney disease, increasing the proportion of Black people with kidney disease from 14.9 percent to 18.4 percent. It would also lead 1.2 million Black people with kidney disease to be reclassified as having a more advanced form of the condition.

## **Advantages**

The new diagnoses and reclassifications to more severe kidney disease would mean earlier access to specialists, specialized care, and prompt treatment. Diagnosing someone with kidney disease sooner should result in improved care options, more referrals to kidney specialists, broader insurance coverage, and better access to specialty services for kidney care.

Removing race from the formula would lead to a million new diagnoses among Black individuals and a 6.8-percent increase in the number of Black patients referred to kidney specialists. It would also increase the number of patients eligible for specialty services such as medical nutrition therapy and kidney disease education by 9.5 percent and 61.3 percent, respectively.

The reclassification to more severe kidney disease would also mean earlier access to the kidney transplant waiting list. In all, this reclassification would result in a 7.7 percent increase in the number of Black people with kidney disease eligible for a transplant.

## Disadvantages

The greater number of individuals with a clinical diagnosis of kidney disease as a result of the modified formula would mean that more people may get recommendations for dose adjustments or contraindications for certain drugs that may either interfere with kidney function or be poorly filtered by the kidneys. These include drugs for cardiovascular illness and hypertension, such as beta blockers and ACE inhibitors; metformin, a first-line drug for type 2 diabetes; newer diabetes medications known as SGLT2 inhibitors; and certain pain medications, such as opioids and nonsteroidal anti-inflammatory drugs like ibuprofen.

If a person's kidney function estimate changes, a physician would be concerned about giving the patient medications that may further erode kidney function or build up to toxic levels in the blood because their kidneys are not filtering fast enough to get rid of the drug. But in the case of lifesaving heart and diabetes medications, the risk-benefit calculus would become complicated: Should a patient with a decreased kidney function under the new formula remain on the same dose of their diabetes medication?

The modified formula may lead to a 54-percent increase in the number of Black individuals who get recommendations for dose reductions on ACE inhibitors, drugs commonly used to manage high blood pressure, heart disease and kidney disease.

The analysis also estimated a 28-percent increase in the number of Black individuals who may no longer qualify for the diabetes drugs metformin and SGLT2 inhibitors. The same patients would no longer qualify for heart medications known as beta blockers, the cancer drug cisplatin, or blood thinners such as warfarin.

Because these therapies could have side effects on the kidneys, those

reclassified with more advanced kidney disease would be considered at high risk for complications from such treatments.

Thus, the researchers caution that taking people off such drugs or reducing the doses of these drugs may possibly exacerbate existing racial disparities in stroke, heart failure and cardiovascular deaths. Reducing the number of people with diabetes receiving metformin or SGLT2 inhibitors, for example, may also worsen already disparate diabetes care outcomes among Black individuals, the researchers caution.

What might happen in reality, Manrai said, is that physicians may decide to keep individuals, whose kidney scores change, on their current medications—particularly if they tolerate them well—and just monitor them more aggressively. The situation may become more complicated when patients who were not previously on such medications suddenly need them because they have developed heart problems or diabetes. In this scenario, physicians may hesitate to prescribe new medications that could interfere with kidney function.

While the formula change may increase the number of Black patients with advanced kidney disease who qualify for a kidney transplant—up to 14,000 if implemented nationwide—it may also render many more Black individuals newly ineligible to donate kidneys—up to 560,000 if implemented nationwide. Researchers caution that fewer Black kidney donors may further limit access to transplantable kidneys for Black individuals with end-stage kidney failure in need of lifesaving transplants. This is because most donated kidneys come from family members, the researchers said. Kidneys from family members tend to be better suited for transplantation based on the matching of immune markers that predict organ compatibility.

## **The way forward**

The findings underscore the urgent need for better and more accurate ways to gauge genetic differences between individuals that go beyond race, an all-too-unreliable construct, the research team said.

Current kidney function calculators must be refined, the researchers said, by removing race while at the same time ensuring that important differences related to kidney function across different populations are not missed. This refinement could be achieved by incorporating new, more reliable biomarkers that capture such variations. Such biomarkers are currently under active investigation and are not yet ready for widespread clinical use, the researchers said.

In the meantime, physicians should ensure transparency with patients whenever they apply [race](#) in any of their diagnostic or treatment decisions, the researchers said.

This is particularly important because patients tested in different settings may end up with two different kidney function estimates, a discrepancy that is also bound to confuse the physicians who treat these patients.

"It's critical to have a transparent and open dialogue between the physician and the patient around what aspects of identity are being used to guide their care, and this is much broader than [kidney function](#)," Manrai said.

Policymakers and hospital administrators could use the findings of the analysis to help determine how to optimize resource allocation for patient care and planning.

"Hospitals are grappling with this issue right now, and there's a complex set of trade-offs in either scenario. Regardless of which alternative they choose, it is important to be aware of the potential downstream effects," Diao said. "If providers know what changes might happen and how these



may affect their patient populations, they can plan and allocate resources accordingly."

Provided by Harvard Medical School

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