

# Issue Brief Series



## Implications of Race and Racism in Medicine: "How black does one have to be?"

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#### Implications of Race and Racism in Medicine: "How black does one have to be?"

**Abstract:** The paper examines the implications of race and racism in medicine, tracing the history of pseudo-scientific racism and its evolving impact on modern healthcare practices as well as technologies. It explores how racial biases manifest in physical devices, computational models, and clinical interpretations, leading to disparities in diagnosis and treatment. It also outlines the difference between race corrections and structural racism in the field of medicine. The paper presents two schools of thought on addressing racism in medicine: eliminating race concepts entirely or refining race-based research. The paper later lists down key policy recommendations that include systematically re-evaluating existing medical guidance, establishing stringent standards for race-based research, increasing minority representation in medicine, mandating anti-racist training, developing precise racial equity metrics, addressing algorithmic biases, and prioritising ethics in medical education. The objective is to address the issue of race and racism which has not been much discussed in academia and to dismantle racism's legacy and advocate for a more equitable healthcare system.

#### Introduction

In recent years, especially post COVID-19, the pervasive impact of racism in healthcare has gained increasing attention, with some experts now declaring it a public health crisis (Robson 2024). From biassed medical devices like pulse oximeters that could be missing low oxygen levels in people with darker skin (Winny and Jurmo 2024) to systemic inequities in treatment and outcomes, the consequences of racial discrimination in medicine are far-reaching and often life-threatening. As Dr. Uché Blackstock notes, "what we are seeing is the culmination of centuries of systemic discrimination" (Tu, 2023). It has become crucial to understand the historical roots of racial pseudo-science in medicine, its ongoing effects on contemporary healthcare practices, and proposed strategies to dismantle these harmful legacies. Consequently, by analysing the interplay between race, racism, and medical science, policy makers can build a more equitable and just healthcare system for all.

#### Race

Race is a socially constructed concept used to categorise people based on perceived physical differences with no scientific basis in biology or genetics (Ioannidis, Powe, and Yancy 2021). As stated, it is generally believed that "race is an indistinct construct that is not always measured accurately and standardised. In 1999, the Human Genome Project emphasised race as nonbiological with no basis in the genetic code" (Ioannidis, Powe, and Yancy 2021). Disparities between "races" in research studies could be due to the many negative effects of deeply ingrained racism that is always evolving.

Despite the recognition of various socially constructed races—such as African, Asian, Latino, Native American, Pacific Islander, and White—there is no consensus on a biological definition of race or its distinction from ethnicity, which refers to a group's cultural identity (Braun, Wolfgang, and Dickersin 2012, p. 1362). Scholars have attempted to define biological races using criteria such as the "one drop" rule, percentage of ancestry, skin colour, and self-identification. The "one drop" rule, originating from a 1662 Virginia law, dictated that any person with any amount of Black ancestry was considered non-White. In the contemporary context of genetic testing, individuals often define race based on the predominant percentage of their ancestry. Alternatively, race has been associated with the amount of melanin in one's skin or has been left to personal self-identification (Ioannidis, Powe, and Yancy 2021).

Each of these methods presents significant challenges when attempting to use race as a biological factor in health disparities research, medical guidelines, and standards of care. These difficulties underscore the complexities and limitations of using race as a biological category in scientific and medical contexts.

### Racism

Racism refers to systemic oppression, discriminatory treatment, and prejudiced beliefs of racial superiority against racial groups. It is crucial to consider that racism "has a profound impact on mental and physical health and can make it more difficult for people to access healthcare services" (Rees 2020).

An important distinction is that while race is a social construct, racism operates as a very real and harmful phenomenon with tangible consequences. As one analysis states, "race is a concept that was socially constructed to privilege one group over another based on physical characteristics like skin pigmentation" (Dordunoo et al. 2022, p. 241). Henceforth "using 'race' as a proxy in health research reinforces and solidifies the unequal treatment" (Dordunoo et al. 2022, p. 241).

#### History of Pseudo-Scientific Racism in Medicine (Age of Enlightenment)

The history of using race in medicine is inextricably tied to justifying oppressive racist ideologies, systems, and pseudoscientific racism. In 1785, Thomas Jefferson infamously claimed "there was 'a difference of structure in the pulmonary apparatus' between slaves and White Americans" to rationalise slavery (Anderson, Malhotra, and Non 2021, p.124 and Braun 2015).

In the 19th century, physician Samuel Cartwright promoted racist pseudoscience "quantifying a 20% difference in lung capacity between Black and White people, establishing race as an important factor influencing lung function" (Anderson, Malhotra, and Non 2021, p. 124). This aligned with Cartwright's invented "drapetomania" construct pathologizing enslaved people's desire for freedom as a mental illness, illustrating how medical racism was used to subjugate Black Americans (Petrić Howe 2022).

This embedding of false racial differences into medical curricula proliferated in the 20th century racist eugenics movement. As the stated, "in the 1920s eugenics era, race differences were included in clinician handbooks, while occupational effects and other social conditions were ignored" (Anderson, Malhotra, and Non 2021, p. 124).

The racialisation of medicine can be dated back to how "X-ray technicians exposed Black patients to increased radiation because they were trained to do so" (Bavli and Jones 2022, p. 947) based on racist assumptions about denser bones and skin interfering with imaging. This "demonstrates the problem of focusing on supposed differences between socially defined races and ignoring heterogeneity within them" (Bavli and Jones 2022, p. 950).

It was only in the late 20th century that such blatant racist pseudoscience in medicine began being discredited. The 1990s Human Genome Project conclusively showed there is no genetic basis for racial classifications, directly contradicting centuries of racist medical ideology (Ioannidis, Powe, and Yancy 2021). The advent of genomic science has revealed that the human genome is 99.5% to 99.9% identical across all individuals. The 0.1% to 0.5% variation observed between any two unrelated individuals is most pronounced within local populations, rather than between individuals from different continents. This has led to the conclusion that there are no distinct continental or racial genomic clusters (Yearby 2020, p. 19).

However, it is found that "even after the finding from the human genome project...race continues to be used to highlight health disparities" (Dordunoo et al. 2022, p. 240). This underscores how deeply embedded racist practices remain ingrained within medical institutions today despite modern scientific consensus rejecting race as a biological construct.

#### **Structural Racism's Compounding Impacts**

Structural racism refers to the systemic policies, cultural norms, and institutional practices that perpetuate racial inequity and Caucasian supremacy across society. In healthcare, this materialises as "occupational segregation of racial and ethnic minority workers", underfunding minority-serving facilities, excluding minority workers from job benefits, and pay policies favouring providers treating wealthier White populations (Yearby, Clark, and Figueroa 2022, p. 188).

These structural forces create compounding negative impacts on minority health outcomes. The COVID-19 pandemic has "illuminated and amplified the harsh reality of health inequities", with minority groups facing disproportionate harm due to occupational exposures, underlying health disparities, and limited access to healthcare services stemming from structural disadvantages (Yearby, Clark, and Figueroa 2022, p. 187).

#### Statistics highlight the stark racial disparities perpetuated by structural racism:

In nephrology, racial adjustments in kidney function estimation are controversial. eGFR algorithms "result in higher reported eGFR values (which suggest better kidney function) for anyone identified as black" (Vyas, Eisenstein, and Jones 2020, p. 875), potentially delaying specialist care or transplantation.

Significant disparities exist in CKD care across racial, ethnic, and socioeconomic lines. "Low-income and racial and ethnic minority patients are less likely to receive recommended care related to CKD risk factors" (National Committee for Quality Assurance 2021, p. 05). These groups often progress to "end-stage renal disease (ESRD)" without prior nephrologist care. Disparities stem from patient, clinician, clinical, and system factors, including "limited access to care and lack of clinical decision support tools" (National Committee for Quality Assurance 2021, p. 05).

The Kidney Donor Risk Index (KDRI) includes race to predict graft failure risk, based on the finding that "black donors' kidneys perform worse than nonblack donors' kidneys, regardless of the recipient's race" (Vyas, Eisenstein, and Jones 2020, p. 875). However, developers don't explain this difference. This adjustment labels black donors as higher risk, potentially unfit.

Black patients face longer transplant wait times, and are more likely to receive kidneys from black donors. Critics argue that "anything that reduces the likelihood of donation from black people could contribute to the wait-time disparity" (Vyas, Eisenstein, and Jones 2020, p. 875), suggesting the KDRI's racial factor may exacerbate this issue.

"Black and Hispanic Americans have long suffered from high rates of conditions such as diabetes, high blood pressure and obesity, which can exacerbate a bout of Covid" (Rabin 2021). These comorbidities also put them at higher risks of developing kidney issues.

Henceforth, people of colour in America especially, blacks are thrice as likely as white Americans "to experience kidney failure and require dialysis or a kidney transplant...Although Black Americans make up only 13 percent of the population, they represent 35 percent of Americans with kidney failure" (Rabin 2021).

Dismantling structural racism is crucial because as the source states, structural racism "leads to differential treatment of people in society" and hence racism is the root cause that should be addressed to improve health equity and reduce disparities (Dordunoo et al. 2022, p. 241).



## Source: Racism in healthcare: a scoping review (Hamed et al. 2022).

#### **Three Categories of Racial Biases**

The three overarching categories of racial bias pervading medicine that must be examined

are:

1. Physical Biases

Physical bias is inherent in the mechanics of medical devices producing skewed results for certain racial groups (Wallis 2021). For example, pulse oximeters have been found to

overestimate blood oxygen levels in darker-skinned patients, with a study showing "there was a 26% lower chance of detecting a fever in Black patients with forehead thermometers" (Advisory Board, 2022). Issues of device calibration and design assumption based on a "white" default can literally risk missing life-threatening medical emergencies for minority patients.

#### 2. Computational Biases

Computational bias can "creep into medical technology when it is tested primarily on a homogeneous group of subjects—typically white males" (Wallis 2021). "An artificial-intelligence system used to analyse chest x-rays and identify 14 different lung and chest diseases worked less well for women when trained on largely male scans" (Wallis 2021). Many such models exhibit racial skews due to training datasets disproportionately representing White/European-ancestry patients. Experts note that computational biases stem from "much deeper roots" than dataset imbalances, often inheriting "racist norms like using 'white' as default" (Howe 2022). Medical AI is particularly susceptible to bias due to costly data generation (Sjoding, Ansari, and Valley 2022). A 2017 skin cancer diagnosis model, trained on mostly light-skinned images, exemplifies this issue. With "fewer than 5% of these images... of dark-skinned individuals," the model's performance likely varies across populations (Zou and Schiebinger 2018).

## 3. Interpretational Biases

Interpretation bias resides not in the machine but in its user, when clinicians apply unequal, "race-based standards to readouts" (Wallis 2021). Cystic fibrosis is more commonly diagnosed in white populations than in Black ones, not due to race, but because the most prevalent genetic mutation causing the disease originated in Europe. Consequently, cystic fibrosis is more common among people of European descent, who are predominantly white. In the U.S., Black individuals can have 16-30% European ancestry due to historical atrocities such as slavery. This European heritage can put Black individuals at risk for cystic fibrosis, but healthcare professionals often overlook this risk due to racial assumptions (Howe 2022). As per norms, infants are screened for cystic fibrosis at the time of birth, and they immediately start receiving treatment at the infant stage, if diagnosed positively. However, this is not the same in

case an infant is socially labelled as 'People of Colour'. And by design this infant will not get screened and thereby might miss out on getting treated.

Numerous studies evidence such biases, like "White male physicians prescribing less pain medications to Black healthcare users compared to White users" (Hamed et al. 2022). Another found "oncologists who measure high implicit racial bias have shorter interactions with Black patients" (Hamed et al. 2022). These human biases often stem from false yet perpetuated biological racial mythologies, such as "healthcare professionals perceiving Blacks to be biologically different than Whites and thus having differential reactions to pain" (Hamed et al. 2022).

The key is recognizing how all three categories of racial biases are deeply interlinked/multidimensional and can compound to create discrepant, even life-threatening medical care for racial minorities. To let go of these biases in medicine, it becomes crucial to understand their origins and counter them with relevant facts.

#### **Racial Pseudoscience's Continuing Impacts**

Race and racist pseudoscience's flawed legacy continues distorting practices across medical fields:

#### **Pulmonary Medicine**

There has been significant criticism in the medical literature of the "routine use of race-based corrections in spirometry, especially in assessing COVID-19 recovery" (Anderson, Malhotra, and Non 2021, p. 125). These adjustments stem from the debunked notion of "innate biological differences" in lung capacity (Anderson, Malhotra, and Non 2021, p. 124 and Braun 2015).

As recently as 1999, a study "established the modern race and ethnicity-specific standards on which correction factors are now based...race-adjustment was routinely built into the software of modern spirometers" (Anderson, Malhotra, and Non 2021, p. 124). However, the academicians and researchers "urge health-care providers to be aware of the racial disparities that might be exacerbated by using race-corrections" because "there is no known major genetic locus that varies by race that can explain racial disparities in lung function" (Anderson, Malhotra, and Non 2021, p. 124). Alongside, it is crucial to understand how bias creeps into med-tech and take steps to find, lessen, and get rid of any harm they might cause, especially in the case of pulmonology.

#### Nephrology

There is widespread systemic racism in kidney care exemplified by formulas incorporating race-adjusted estimates of kidney function based on race.

For example, "[a] black patient with the same creatinine level [as a white patient] would get a race correction under the formula that raises the level to 33", because of which, "the black patient would not get a referral to a specialist" (Kolata 2020). It is also one of the reasons why many black patients do not get enlisted for organ transplant. Similarly, there still exists a belief that black people are more muscular and hence their creatinine levels are higher than usual, and therefore justify such race corrections in spirometry, which in reality is not factual. Such flawed calculations can have devastating impacts on proper medical intervention and management of life-threatening kidney disease.

#### **Obstetrics**

Studies evidence race-based discrimination in obstetric care, with "Black women...more likely than White women to receive general anaesthesia for caesarean delivery and to receive no analgesia for vaginal delivery" (Hamed et al. 2022). This aligns with the history of underestimating pain in Black patients based on racist biological myths and devaluing of Black lives.

## Radiology

The source illuminates how "the easy racialization of x-rays" historically led to dangerous overexposure, with guidance stating "[f]or 'Black or brown' patients, adjustment was recommended...to use a dose 4 kilovoltage peak higher than normal — an increase of 9.5 to

25%" due to unfounded assumptions about denser bones and skin density (Bavli and Jones 2022, p. 948-950).

TABLE I. PATIENT CLASSIFICATION						
Easy to Penetrate	Normal	Hard to Penetrate				
Very young	Average white	Excessive musculature				
Old Under-developed	adult 20 1 to 55 years.	Additive pathology				
Destructive pathology	Normal musculature and bone development	Black or brown color				
Modification in Technique						
4 kv.p. less than for normal or K-4	Normal K values	4 kv.p. more than for normal or K+4				

A 1957 article in *The X-Ray Technician* classified "whites" as "normal." For "Black or brown" patients, adjustment was recommended to get a better radiograph (e.g., use a dose 4 kilovoltage peak higher than normal — an increase of 9.5 to 25%). Source: (Bavli and Jones 2022, p. 948).

The list goes on, with race and racist pseudoscience perpetuating everything from pulse oximeter inaccuracies to skewed AI diagnostic models and discriminatory treatment leading to dramatically worse health outcomes for minority patients overall.

**Racial Bias in Health Care Algorithms** 

Algorithms and artificial intelligence are used as analytic tools to assess risk and guide care for patients. The tools can display racial bias in the following ways:

The explicit use of race to predict outcomes and assess risk. Physicians have recently begun to move away from this more obvious form of bias.

The use of data that inadvertently captures systemic racism. This form of bias, while unintentional, can result in additional inequities.

## **Racial Bias in Clinical Care Algorithms**

Why are algorithms used in clinical care?

Physicians use diagnostic algorithms that "correct" or predict their outputs to individualize risk assessment and guide clinical decisions

Why do these algorithms incorporate race?



Despite evidence that race is not a reliable proxy for genetic differences, how to allocate clinical resources or treatment adherence, using race as a factor has become a common practice when designing clinical algorithms

What happens when algorithms adjust for race?



Embedding race into health care data and decisions can unintentionally advance racial disparities in health



They may direct more attention or resources to White patients than to members of racial and ethnic minorities

#### Examples of Race Correction in Clinical Medicine

Race and ethnicity are often correlated with outcomes as minority patients routinely have different health outcomes from White patients. Thus, researchers decided to adjust for race in the following algorithms.

Medical professionals have moved away from these tools over the past year because of concerns about their racist impacts

#### Cardiology

The American Heart Association Get with the Guidelines-Heart Failure Risk Score assigns three additional points to any patient identified as "nonblack," categorizing Black patients at a lower risk of death among patients admitted into the hospital.



Impact: May raise the threshold for using clinical resources for Black patients

Impact:

May delay referral to

specialist care or

listing for kidney

transplantation

#### Nephrology

Estimated glomerular filtration rate (eGFR) MDRD and CKD-EPI equations reported higher eGFR values for patients identified as Black, suggesting better kidney function.



#### Obstetrics

The Vaginal Birth after Cesarean algorithm predicted the risk of labor for someone who has previously undergone a C-section. It predicts a lower likelihood of success for African Americans and Hispanics.



Impact: There are health benefits to vaginal deliveries and non-White women continue to have higher rates of C-Sections than White women

#### Urology

The STONE score predicts the likelihood of kidney stones in patients who present to the emergency department with flank pain. The "origin/race" factor adds 3 points (of a possible 13) for a patient identified as "nonblack."



Impact: May steer clinicians away from thorough evaluation for kidney stones in Black patients

# **Racial Bias in Other Health Care Algorithms**

Algorithms are used to identify patients with complex health needs in order to provide more comprehensive care management. However, these algorithms can exhibit significant racial bias.

A 2019 study of one such algorithm found:



Black patients who are considerably sicker than White patients are given the same risk score

## Why is this?

This algorithm assigned risk scores based on past health care spending. Black patients have lower spending than White patients for a given level of health, this due to existing racial disparities in the health care system.





Source: (NIHCM 2021)

## **Effects of Racism on Treatment Choices**

Studies from the USA reveal racial disparities in medical treatment (Hamed et al. 2022). Black and Latinx patients have lower cardiology admission rates and are less frequently prescribed anticoagulants for strokes compared to Whites and the Black patients also receive more burdensome end-of-life care (Perry et al. 2020).

Implicit racial biases affect treatment in emergency units and oncology, leading to less serious diagnoses because the "implicit biases regarding blacks led to a lower likelihood of a referral to specialist when physicians were under high time pressure" (Stepanikova 2012). Additionally, it was found in a research Black and Hispanic patients "were more likely to experience both with-holding behavio[u]rs and misattributions about public insurance" (Leech, Irby-Shasanmi, and Mitchell 2018, p. 234). Black patients are also less likely to receive "HIV prophylaxis treatment... treatment with immunotherapy compounds independent of their insurance status" (Hamed et al. 2022). Racial concordance between Black infants and physicians

is associated "with a significant improvement in mortality... and that these positive effects of physician newborn racial concordance manifest strongly in more complicated cases and when hospitals deliver more Black newborn" (Hamed et al. 2022). However, one study found no racial differences in emergency unit admissions (Kerner et al. 2019).

#### **Training on Anti Racism in Healthcare**

Discussing racism in healthcare is challenging. Studies show medical faculty and nurses "do not discuss racism in healthcare in their workplace... and are uncomfortable about discussing racism" (Hamed et al. 2022). Healthcare staff find discussions on structural racism polarising, and "a qualitative study from the UK demonstrates that there was generally an inadequate awareness of the meaning of multicultural care among medical students" (Hamed et al. 2022).

Antiracist training improves "understanding of racism in healthcare after the intervention, increased confidence and comfort in discussing and addressing racism... and greater interest in receiving more antiracist training" (Hamed et al. 2022). Participants show greater empathy towards racial minorities, though implicit racial biases remain unchanged. In Australia, students' attitudes towards Aboriginal people improved, however, "issues around racism were not resolved" (Hamed et al. 2022).

Notably, the medical field's historical embedding of racist ideologies continues negatively impacting clinical practices and patient outcomes today if left unaddressed.

### **Binary Schools of Thought on Race and Racism**

There are two main opposing perspectives on how to confront and dismantle the pernicious impacts of race and racism in medicine going forward:

## 1. Eliminating Race Concepts Entirely

This view, according to the academia, argues race is a fundamentally flawed categorization with no scientific validity and should be completely eliminated in medical contexts, replacing it with more precise metrics like "genetic ancestry" and specific socioeconomic/environmental factors driving health disparities (Ioannidis, Powe, and Yancy 2021).

Proponents of eliminating race concepts from medicine argue this approach provides several potential benefits:

- Accuracy and Inclusivity: Instead of using oversimplified racial binaries that obscure underlying causative elements, more precise and useful insights could be obtained by utilising metrics such as genetic ancestry grouping and detailed socioeconomic and environmental data.
- Prevents Perpetuating Racist Stereotypes: Completely removing the race construct from medicine could help break down racist ideologies and harmful stereotypes that have persisted, like beliefs in biological racial differences.
- Acknowledges Diversity Within Racial Groups: As proved in many studies that racial differences are higher within the racial groups as compared to between these groups. Therefore, measuring specific ancestral genetics and social determinants avoids the pitfalls of treating racial groups as monolithic and ignoring vast heterogeneity within these populations.

However, critics raise some potential limitations of this approach:

- Lack of Representation in Genetic Databases: Many genetic ancestry databases remain disproportionately based on populations of European descent, making analysis less accurate for other ancestries.
- Loses Ability to Identify Racial Disparities: Eliminating racial categories entirely could obscure or downplay the scope to identify ongoing inequities in health access and outcomes between different marginalised groups.

• Challenges in Standardising Social Determinants: Quantifying complex social factors like discrimination, segregation, access to quality education/healthcare etc. in a standardised manner for inclusion in health algorithms presents difficulties, especially from a global context.

## 2. Refining and Improving Race-Based Research

The opposing view argues using race as an initial proxy to identify and study health inequities, remains valuable "it captures the biological effects of racism unlike any other variable", if significantly enhanced by redefining archaic racial categories, incorporating complementary biological/social variables, and ensuring racist norms like using 'white' as default are challenged and "actively fight against considering race as an essential, genetic variable" (Ioannidis, Powe, and Yancy 2021 and Lorusso and Fabio Bacchini 2023).

Proponents argue this nuanced approach could be beneficial in following ways:

- Highlighting Inequities to be a Driving Inquiry: Using race as an initial signal of disparities can drive further investigation into causal factors like genetics, environment, discrimination etc.
- Acknowledging Race's Social Impacts: Since race is a social construct with real discriminatory consequences, including it with added context may ensure these impacts aren't overlooked because of it being multidimensional and thereby getting rid of issues of multicollinearity in research.
- Leveraging Existing Race-Based Data: Much of the existing research and data utilises racial categorizations, which a reframed approach could continue building upon rather than discarding entirely.

However, critics of continuing any race-based practices in medicine raise important concerns:

- Perpetuates Flawed Biological Race Concepts: Including race, even with refinements, risks perpetuating the harmful societal framing of intrinsic biological differences between races.
- Data Could Be Misused to Compound Disparities: Explicit race data, however reframed, risks being misused or misinterpreted in ways that further disadvantage people of colour.
- Deflects from Racism as the Root Cause: A renewed focus on race variables distracts from discrimination as the root cause that should be the central target of interventions and further legitimises such inequalities similar to how it was done during the Age of Enlightenment.

## **Policy Recommendations**

Considering the arguments of academia and the findings of several research papers and acknowledging both the schools of thought on race, some of the key recommendations from public policy perspective to make global health more inclusive are:



Source: (Cerdeña, Plaisime, and Tsai 2020, p. 1127)

## 1. Systematic Re-Evaluation of Existing Guidance

"Systematically reexamine evidence involving race" to identify and revise/replace racist diagnostic criteria, treatment protocols, formulas, and any other practices perpetuating inequities (Ioannidis, Powe, and Yancy 2021). This also is important to include and understand the biology and health of people who categorise themselves as multiethnic in light of how globalisation has broken territorial borders.

## 2. Stringent Standards for Any Race-Based Research

Science was used "to establish a flawed premise of biological race-based differences, so should science now focus on illuminating that which is represented by race and become a trailblazer toward better health equity" (Ioannidis, Powe, and Yancy 2021). Establishing robust standards that any explicitly race-based research must meet, including:

- Challenging white-centric norms and focusing minoritized perspectives
- Capturing full biological, social, and ancestral context
- Transparent accounting of potential impacts on marginalised groups
- Prioritising reducing health disparities as the prime objective

Research should attempt to understand the various processes through which racism is (re)produced in healthcare.

Research should apply clear definitions of racism and should not use racial categories uncritically as this may risk (re)producing racializing discourse in healthcare research.

Research could benefit from sociological theorizing to conceptualize racism and processes of racialization in healthcare.

Research should attempt to examine how denial of racism in healthcare may contribute to the reproduction of racism.

Research should extend to other contexts outside the USA to capture other perspectives of racism.

## Key recommendations for future research on racism in healthcare. Source: (Hamed et al.

<u>2022).</u>

Though there has been an increase in research on racism in healthcare, the existing research face several limitations. It is "mainly descriptive, atheoretical, and uses racial categories

critically, as if they were fixed and ahistorical" often ignoring the complex processes of racialization in healthcare settings. To address these shortcomings, academicians recommend (as described in the figure above) that research should focus on the processes through which racism is reproduced, apply clear definitions, and avoid uncritical use of racial categories (Flanagin, Frey, and Christiansen 2021). The recommendations also highlight the importance of incorporating sociological theories to better conceptualise racism and racialization in healthcare contexts. Additionally, they propose examining how the denial of racism in healthcare may contribute to its perpetuation. Importantly, there's a call to expand research beyond the USA to gain diverse perspectives on racism in healthcare systems globally. These recommendations aim to shift research towards a more comprehensive, process-oriented approach that can better illuminate the complex dynamics of racism in healthcare systems.

#### 3. Increasing Population Representation

Increasing representation of minority groups in medical education, research, leadership, clinical trials and across all levels to elevate diverse perspectives "representing populations, not specifically races" (Howe 2022). It is essential for research and clinical trials to encompass a sample population which is most similar to the actual population of a country or an area.

#### 4. Comprehensive Anti-Racist Training

Mandating comprehensive anti-racist training in medical curricula, teaching the history of racism in medicine and strategies to recognize/mitigate contemporary biases (Cerdeña, Plaisime, and Tsai 2020). It is more so important as one of the factors which has led to this disparity is structural racism and not flaws in medicine as a subject let alone.

#### 5. Developing Precise Racial Equity Metrics and Racism Indices for Health Studies

Investing in research developing more precise racial equity metrics beyond simplistic racial binaries like ancestral genetics and quantifiable social determinants. Adopting racism indices "tool that can be used to quantify the experiences of black people within societies" to directly correlate racist experiences with health outcomes in a standardised manner (Dordunoo et al. 2022, p. 242 and Braun 2015).

Many researchers have Racism Index tool indexes experiences like racial slights, harassment, workplace discrimination, housing discrimination etc. to generate a quantified "perceived racism score" for individuals that could then be included in health statistical models and prevention strategies.

## Table 1. Racism index Tool.

Instruction: Racism is the belief that human beings possess different characteristics, abilities, or qualities that make them inferior or superior to one another. This belief influences the way people treat one another, as well as how policies of institutions are created to disadvantage one group of people and advantage others. We are interested in knowing your experiences of racism in society and the effects on social determinants of health (i.e., adequate employment, education, housing etc.). Please answer the following questions about your outer physical appearance, place of origin and experiences of racism.

I. Are you a descent of a slave? [Yes/No]

- Ia. If no, what is your ancestral origin? [choices should reflect geographical location; note middle east can be different depending on who you ask, so for consistencies either select countries or continents, although heterogeneity on the continent of Africa will not be captured—i.e., non-black African]
- 2. What is your skin color? [dark, light, black, white...]
- Do you consider yourself an immigrant to the country where you currently reside? [N (born in an area where I currently live) /Y]
- If yes to question 3, are you... I<sup>st</sup> 2<sup>nd</sup> 3<sup>rd</sup> etc. generation [please complete]
- 5. Do you believe you speak with an accent that is different from those around you? [Y/N]
- 6. Do you feel respected or treated with courtesy in your interactions with people where you live or work? [Yes//No]
- How often would you say you encounter these experiences you indicated in question 6? [Daily/1-2 times per week/3-5 times per week/ Monthly/very infrequently]
- 8. If no to question 6, why do you think you are treated with less courtesy or respect? [open ended]

Examples of race-based medicine, the potential harm to patients, and race-conscious alternatives:

	How race is used	Rationale for race-based management	Potential harm	Race-conscious approach
eGFR <u>6</u>	eGFR for Black patients is multiplied by 1·16-1·21 the eGFR for White patients, depending on the equation used	Black patients are presumed to have higher muscle mass and creatinine generation rate than patients of other races	Black patients might experience delayed dialysis and transplant referral <u>8, 9</u>	Use eGFR equations that do not adjust for race (eg. CKD-EPI Cystatin C). <sup>10</sup>
BMI risk for diabetes <sup>7</sup>	Asian patients considered at risk for diabetes at BMI ≥23 vs 25 for patients of other races	Asian patients are presumed to develop more visceral than peripheral adiposity than patients of other races at similar BMI levels, increasing risk for insulin resistance <sup>7</sup>	Asian patients screened for diabetes despite absence of other risk factors might experience increased stigma and distrust of medical providers <sup>11</sup>	Screen patients with lower BMIs on the basis of indications of increased body fat (eg, body roundness, <sup>12</sup> body fat percentage), not based on race
FRAX.13	Probability of fracture is adjusted according to geography or minority status, or both	Different geographical and ethnic minority populations are presumed to have varied relative risks for fracture on the basis of epidemiological data	Some populations, including Black women, might be less likely to be screened for osteoporosis than other populations <sup>14</sup>	Screen patients for osteoporosis on the basis of clinical risk criteria, rather than race; counteract existing biases that place Black patients at risk because of racial essentialist beliefs about variation in bone density. <sup>15</sup>
PFT <u>16</u>	Reference values for pulmonary function are adjusted for race and ethnicity	Racial and ethnic minority groups are presumed to have varied lung function on the basis of epidemiological data	Black patients might experience increased difficulty obtaining disability support for pulmonary disease <sup>17</sup>	Use unadjusted measures of lung function for all patients: counteract existing biases that harm Black patients because of racial essentialist beliefs about variation in lung capacity. <sup>18</sup>
JNC 8 Hypertension Guidelines <sup>19</sup>	Treatment algorithm provides alternate pathways for Black and non- Black patients	ACE-inhibitor use associated with higher risk of stroke and poorer control of blood pressure in Black patients than in patients of other races	Black patients might be less likely to achieve hypertension control and require multiple antihypertensive agents <sup>20</sup>	Consider all antihypertensive options for blood pressure control in Black patients; adjust as needed to achieve goals and manage adverse effects
Paediatric UTI diagnosis <sup>21</sup>	White race in girls and non-Black race in boys are considered independent risk factors for UTI	Study of febrile children in the emergency department found highest prevalence of UTI among White girls and non-Black boys <sup>22</sup>	Experimental data suggests that these guidelines could affect management of UTI by race <sup>23</sup>	Treat UTI in children on the basis of clinical presentation, regardless of race
ASCVD risk estimation	Race-specific equations included to estimate ASCVD risk	ASCVD events higher for Black patients than patients of other races with otherwise equivalent risk burden <sup>24</sup>	Black patients might experience more adverse effects from recommended statin therapy, including persistent muscle damage <sup>25</sup>	Recommend preventive therapy on the basis of clinical metrics and comorbidities; consider pathways by which structural racism might increase cardiovascular risk among Black patients and promote resources to reduce racial stress and trauma <sup>26</sup>
Eltrombopag dosing	East Asian patients receive half the starting dose compared with non-east Asian patients	Limited pharmacokinetic studies suggest reduced metabolism of eltrombopag in patients of East Asian descent <sup>27</sup>	Some East Asian patients might receive inappropriate dosing <sup>28</sup>	Initiate same starting dose for all patients, regardless of race, and adjust as needed on the basis of platelet response

Source: (Cerdeña, Plaisime, and Tsai 2020, p. 1126)

## 6. Addressing Biases in Algorithms



#### 7. Prioritising Ethics in Medical Education and Clinical Research

It is also evident that the majority of medicinal textbooks discuss cases and diseases involving white patients. Therefore, keeping in mind medical and clinical ethics, the need for an inclusive curriculum and an inclusive approach to practise medicine is most essential, not merely a one-time topic but throughout the professional career. A robust medical ethics curriculum prioritising key principles like justice, non-maleficence, respect for persons, and analysing racism as a critical social force impacting equitable care and health access for all populations. As the medical ethics field suggests, sound ethical reasoning is crucial considering "strong evidence of racial and ethnic disparities in health care" moreover, "it is critically important that healthcare professionals are educated specifically to address issues of culture in an effective manner" in a diverse society where people do not share the same values, perspectives or experiences (AAMC 2005, p. 01 and Nineham 2020). Such ethical introspection is vital to purge racist ideologies persisting in medical practice.

This kind of discrimination is so subtle that in everyday policy discourse it might not get enough attention; however, critical times like the pandemic push institutions to revisit this gap. In essence, a multipronged approach is required to dismantle racism's insidious legacy across medical education, clinical practice, research paradigms, and the structural makeup of healthcare institutions themselves. Only by directly confronting the pseudoscientific racist roots can medicine truly heal from its own inequitable past. Moreover, when it comes to science, it is supposed to question itself and keep evolving. Henceforth, keeping in mind the changing patterns of the global order, more efforts need to be put in to make global health inclusive.

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