Racism, not Race: A Review of Race Correction and Estimated Glomerular Filtration Rate

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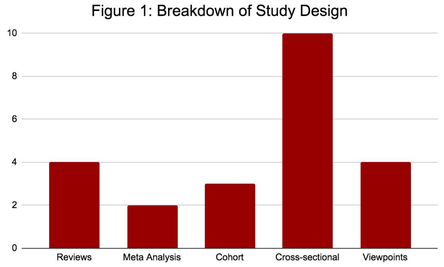
Introduction

- **Healthcare disparities** are entrenched in the practice of medicine in the U.S. as a by-product of centuries of **structural racism** (Grubbs, 2020) and systemic discrimination against racial and ethnic minorities (Boyd, 2018).
- Many diagnostic tools such as pulmonary function tests, glomerular filtration rate (GFR), and screening measures include race as a correcting variable, despite the current understanding of race as a social construct rather than a biological factor (Vyas, et. al., 2020).
- Although heritable factors are related to risk for some diseases, these diagnostic tools and algorithms attribute observed clinical disparities to racial ancestry, and fail to account for **racism**, which current research suggests is the root cause (Gravlee, 2009; Braveman, 2014).
- **Race-based medicine** is defined as this improper use of race in diagnosis and treatment of disease such that it reinforces an "othering" historically used to justify racist practices. It continues to perpetuate discrimination of Black and brown individuals(Grubbs, 2020).
- This poster aims to critically review the established body of research regarding **estimated Glomerular Filtration Rate (eGFR)** and the use of a race correction multiplier in the equation.
  - GFR estimation from serum creatinine includes a race correction in both the Modification of Diet in Renal Disease (MDRD) and (Chronic Kidney Disease Epidemiology Collaboration) CKD-EPI equations. The underlying assumption is that Black individuals have greater muscle mass and thus a higher serum creatinine (Levey et. al, 2009).
  - Many medical institutions have determined that race is an unjustifiable addition to GFR estimation, sparking the need to re-evaluate the rationale behind the inclusion of a race corrector (University of Washington, Department of Medicine, 2020).
  - The aim of this review is to critically examine the rationale behind the inclusion of a race multiplier and explore whether it is reducing or further exacerbating the racial inequities faced by racial minorities.

Methods

- Rapid reviews are a way of gathering evidence to inform policy and program decision making and have a preference for including existing systematic reviews (Hartling, et al. 2017). The authors acknowledge that despite extensive literature searches, some relevant articles may have been omitted.
- Rapid review of literature consisted of electronic searches conducted in PubMed and Google Scholar between August and October 2020 using a combination of the **search terms: race, GFR, creatinine, MDRD and CKD-EPI**. Titles and abstracts of the search results were screened to identify relevant articles.
- Additional **inclusion criteria:** papers that were published in English, in the last 15 years. No study type restrictions were applied. **Exclusion criteria:** papers that did not focus on an adult population (defined as ages 18-64); papers that did not explore race as a variable of analysis in relation to GFR
- **29 articles** were reviewed for possible inclusion after the initial screen, of which **22** met the inclusion and exclusion criteria. All papers, regardless of position on race correction, were analyzed.
- **Themes:** Themes were determined based on multiple sources noting similarities and coalesced under a broad categorization. In parallel, papers were also reviewed to understand the costs and benefits associated with use of the eGFR.
- "Benefit" was operationalized as any justification for removal of race correction from eGFR. "Cost" was operationalized as any concern against removal of race correction from eGFR.
  - Representation and sample size are important considerations in this review, meriting 'weak sample size or poor representation' as a point of analysis. This was the only theme of analysis that was pre-determined prior to review of papers.
  - Remaining themes were established during analysis to compare and contrast the different papers on eGFR and race.

Figure 1: Breakdown of Study Design



Results

Out of the 29 papers analyzed, 7 did not meet criteria; 2 had publication date > 15 years, 2 did not include race as a variable of analysis, 2 examined race for an algorithm other than GFR, 1 focused on pediatric population.

- See **Figure 1** for a breakdown of study designs of the 22 papers that were included in the analysis.
- Five pervasive themes discussing race correction were identified, with multiple papers exhibiting more than 1 theme **(Figure 2)**
- Our cost-benefit analysis identified 5 cost themes and 4 benefit themes in 14 out of the 23 papers **(Figure. 3)**

Figure 2: Themes

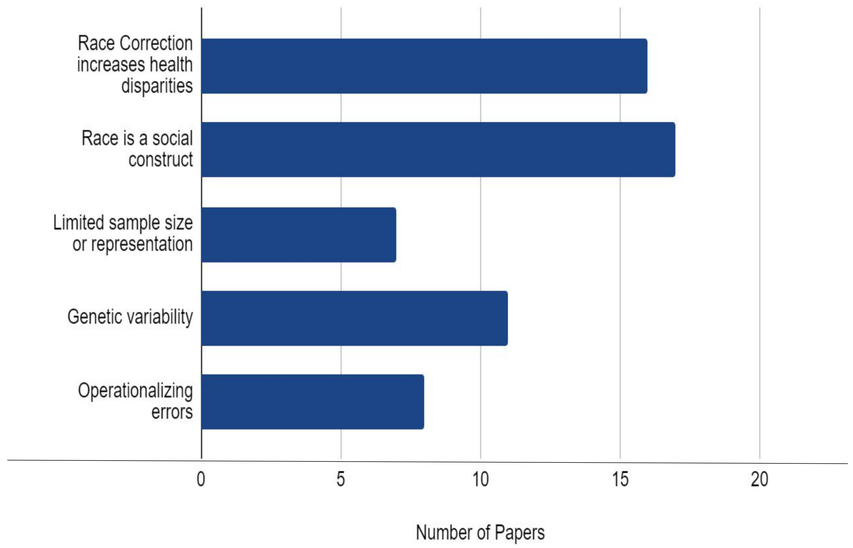
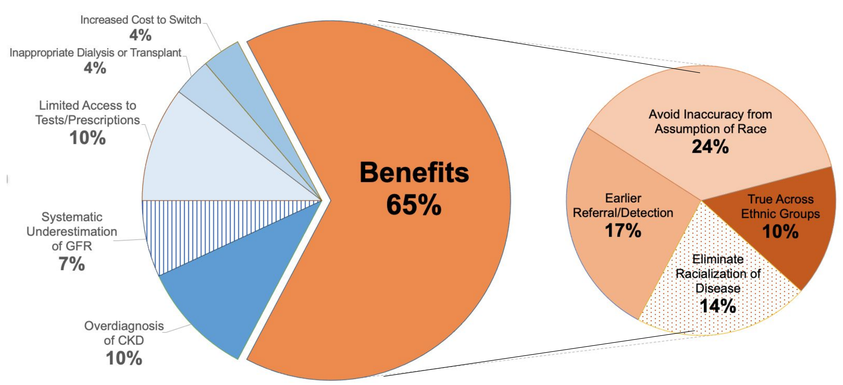


Figure 3. Cost-Benefit Analysis



Discussion

Our results demonstrate five themes against race correction. Firstly, race correction increases health disparities. The literature shows an incongruence between the incidence of ESRD and prevalence of CKD among black patients that cannot be attributed to rate of progression alone, suggesting an issue with CKD detection in the Black community (Peralta et. al, 2010; Arora et. al, 2012). Black patients are less likely to receive transplants and when they do, outcomes are not as positive (Foley et. al, 2007). Acutely, Black patients present with greater rates of AKIs at higher GFRs (Grams et. al, 2015). From a benefit perspective, removal of race correction may allow for earlier referral to nephrology (Levey, et. al, 2020). Given that eGFR is often used as a screening tool to assess kidney function, it is important to have early detection of CKD. Race correction elevates the threshold for screening and its removal could allow for earlier detection of CKD (Peralta et. al, 2010).

The major catalyst for the removal of race is its origins as a sociopolitical category rather than biological phenomenon (Grubbs, 2020). The Black or African American race is not a homogenous identifier succumbing to operationalization errors, assumption, and bias (Eneanya et. al, 2019). Specifically, countries abroad have identified that race correction is not translatable (Rocha et. al, 2020). Secondarily, studies who have justified having a race correction, do not have strong evidence to drive its conclusion. Given the dynamic population of immigrants and heterogeneity of race, race correction serves a binary that does not exist.

In addition, external validation of CKD-EPI was completed with a sample where only 10% as Black (Levey, et. al, 2009). The MDRD was developed in 1999 with data that had an under-representation of minorities and both equations were found to overestimate GFR in Black Europeans (Rocha, et. al, 2020). Furthermore, black patients included in CKD-EPI development were pulled from AASK data and were skewed to have BMI > 30 (Flamant, et. al, 2013).

Previous justification for race correction was on the assumption of muscle mass or nutritional status, both of which were found to not play a role in serum creatinine differences (Hsu et. al, 2008), while studies abroad show no significant difference in serum creatinine between Black, Mixed Race, and white patients (Barcellos, et. al, 2015). Importantly, race is not a marker of genetics (Grubbs, 2020) suggesting that discussion of APOL 1 mutations (Levey et. al, 2020) do not justify continued use of race correction.

Failure to operationalize race is a concern, with most research or medical practices lacking standardization or relying on recommendations from the office of Management and Budget (Eneanya et. al., 2019). Recent literature has suggested that use of race correction requires transparency with patients, must confer benefit, and patient refusal to use race correction should be accomodated (Levey, et. al, 2020). While this would be a step forward, we suggest that health literacy and medical mistrust may serve as issues moving forward.

Conclusions

- Racial associations contribute to health disparities by encouraging reliance on social identity for diagnosis, while distracting from true underlying disease processes, such as **racism**.
- Although race-based medicine is inherently flawed, it is dangerous to dismiss race completely from discourse regarding health disparities. One's cultural and social identity as it pertains to race, as well as collective experiences such as sustained structural discrimination, is crucial to acknowledge when examining underlying processes of disease and developing diagnostic tools.
- Despite the results of this literature review suggesting greater benefits than costs to removing race correction from eGFR calculation, we also appreciate 'race-blind' medicine is not an ultimate solution.
- Our literature review underscores a need for more research on this topic, but through the lens of an underlying assumption that race has no biological basis. Further exploration is needed particularly on the relationships between racism, CRP, chronic inflammation, and kidney function.
- Based on the literature that currently exists, however, we posit that the use of race correction in eGFR perpetuates bias in medicine with the ultimate cost of delayed treatment, and a biologic basis does not hold true given genetic variability.

References

Given the extensive list of references for this review, we have provided a link to full list of our references:
PDF Link for References