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Brief Communication

Adjusting for race in metrics of organ procurement organization performance

Jonathan M. Miller [1,2,*], David Zaun [1], Nicholas L. Wood [1,2], Grace R. Lyden [1,2], Warren T. McKinney [1,2], Ryutaro Hirose [1,3], Jon J. Snyder [1,2,4]

[1] Scientific Registry of Transplant Recipients, Hennepin Healthcare Research Institute, Minneapolis, Minnesota, USA
[2] Department of Medicine, Hennepin Healthcare, University of Minnesota, Minneapolis, Minnesota, USA
[3] Department of Surgery, University of California San Francisco, San Francisco, California, USA
[4] Department of Epidemiology and Community Health, School of Public Health, University of Minnesota, Minneapolis, Minnesota, USA

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ABSTRACT

The Scientific Registry of Transplant Recipients has previously reported the effects of adjusting for demographic variables, including race, in the Centers for Medicare & Medicaid Services (CMS) organ procurement organization (OPO) performance metrics: donation rate and transplant rate. CMS chose not to adjust for most demographic variables other than age (for the transplant rate), arguing that there is no biological reason that these variables would affect the organ donation/utilization decision. However, organ donation is a process based on altruism and trust, not a simple biological phenomenon. Focusing only on biological impacts on health ignores other pathways through which demographic factors can influence OPO outcomes. In this study, we update analyses of demographic adjustment on the OPO metrics for 2020 with a specific focus on adjusting for race. We find that adjusting for race would lead to 8 OPOs changing their CMS tier rankings, including 2 OPOs that actually overperform the national rate among non-White donors improving from a tier 3 ranking (facing decertification without possibility of recompeting) to a tier 2 ranking (allowing the possibility of recompeting). Incorporation of stratified and risk-adjusted metrics in public reporting of OPO performance could help OPOs identify areas for improvement within specific demographic categories.

Abbreviations: CDC, Centers for Disease Control and Prevention; CMS, Centers for Medicare & Medicaid Services; DSA, donation service area; OPO, organ procurement organization; OPTN, Organ Procurement and Transplantation Network; SRTR, Scientific Registry of Transplant Recipients.

* Corresponding author. Jonathan M. Miller, PhD, Hennepin Healthcare Research Institute Chronic Disease Research Group, Minneapolis, MN, USA.
E-mail address: jonathan.miller@cdrg.org (J.M. Miller).

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1. Introduction

In December 2020, the Centers for Medicare & Medicaid Services (CMS) published a final rule on metrics by which organ procurement organizations (OPOs) would be evaluated for recertification. OPOs are evaluated on unadjusted donation rate and age-adjusted transplant rate. Recertification decisions in the fourth year of the recertification cycle (currently expected to be 2026) are set to be made solely on these metrics, with OPOs significantly below the national median rate from the previous year being decertified with no possibility to recompete for their donation service area (DSA). If these decertifying decisions had been made for the 2023 year of the cycle, over 40% of the OPOs would be decertified without possibility for recompeting.[1] CMS opted to not adjust for characteristics of the populations served by the OPOs, other than adjusting the transplant rate for the decedent's age.[2,3] In support of their decision, CMS noted that OPOs should be held to high standards within all demographic subgroups of potential donors and feared that adjustment for race may allow OPOs to "hide" poor performance within their minority populations.[3] However, analyses by the Scientific Registry of Transplant Recipients (SRTR) showed that failing to adjust for demographic characteristics like race could lead to flawed conclusions about OPO performance, whereby an OPO with higher donation rates in *all* subgroups can have a lower donation rate overall, a statistical phenomenon known as Simpson's paradox.[4-6]

Adjusting for race is controversial. Recent studies on removing race adjustment from measures that relate to an individual patient, like measures of an individual's kidney function,[7-11] are grounded in the idea that the average experience of a racial group will not accurately predict the experience of an individual from that group. This is called the ecological fallacy. The simpler statement is that race is not a biological variable. While this fallacy generally limits the scenarios in which it is appropriate to adjust for race in measures of individual health, it does not necessarily also apply when the measurement is at the level of a population—for example, the performance of an organization that serves a population. In the case of measurements of an organization's performance, social mechanisms like mistrust in the health care system due to historic experiences of racism may be very relevant. In such cases, *failing* to adjust for the racial mix of the population served by the organization may disincentivize organizational outreach to potential donors[12-14] affected by racism and penalize organizations that outperform the national average in disadvantaged populations.

The decision of whether to adjust for social variables should not be based on dogma but on thorough exploration, both theoretical and quantitative, of the effects of adjustment. A previous SRTR study examined adjustment for multiple variables at the same time.[4] The present study aims to isolate the effect of adjusting for race and calculate the effects on OPO tier rankings if the CMS donation and transplantation rates were additionally adjusted only for race.

2. Methods

2.1. Population

This study calculated donation and transplantation rates using the CMS method for the 2020 calendar year both with and without adjustment for race among the 58 OPOs evaluated in 2020.

This study used data from SRTR current as of January 31, 2023. The SRTR data system includes data on all donors, waitlisted candidates, and transplant recipients in the United States, submitted by the members of the Organ Procurement and Transplantation Network (OPTN), and has been described elsewhere.[15] The Health Resources and Services Administration, US Department of Health and Human Services, provides oversight to the activities of the OPTN and SRTR contractors. Data for estimation of donor potential were obtained from the Multiple Cause of Death (all counties) data made available from the National Vital Statistics System, National Center for Health Statistics, Centers for Disease Control and Prevention (CDC), US Department of Health and Human Services, and CMS.[16] SRTR data are not considered human subjects research, as they are data collected for the federal government for the purpose of public health surveillance. Work performed by the SRTR is, therefore, exempt from institutional review board review as a Public Benefit and Service Program under 45 CFR 46.101(b)(5) of the pre-2018 Common Rule, which is now detailed at 46.104(d)(5) as "Research and demonstration projects that are conducted or supported by a Federal department or agency" under the Common Rule 2018 version.

2.2. Statistical methods

Race groups were aggregated to Black, White, Asian or Pacific Islander, and Mixed or Other Race to allow the classification for the numerator, based on OPTN/SRTR data, and denominator, based on CDC data, to match. In the OPTN/SRTR data during our study period, because race and ethnicity are collected in the same question, donors of Hispanic ethnicity with no reported race were classified as White. In the 2020 CDC data, in which race and ethnicity were collected on separate questions, 94.7% of Hispanic potential donors reported White as their race. While this may mean the assumption of White race for Hispanic ethnicity unless otherwise specified results in minimal misclassification; to further support our results for race alone, we conducted a sensitivity analysis in which a category for patient Hispanic ethnicity regardless of race was included. National donation and transplant rates, as defined for the CMS metrics, for each race group were calculated as actual donors and transplants divided by potential donors nationally and presented as a percentage.

The CMS metrics are unadjusted for donation rate and age-adjusted for transplant rate. For this study, race adjustment was incorporated in both metrics (race-adjusted donation rate;

age- and race-adjusted transplant rate) using indirect standardization, which is the method that CMS uses to age-adjust the transplant rate metric. For both the CMS final rule metrics as well as the race-adjusted metrics, OPOs were assigned to tiers using the CMS method.[3] Under the CMS method, OPOs with the upper 95% confidence level below the median of either the donation rate or the transplant rate from the previous year are assigned to tier 3, which puts them at risk of decertification without the possibility to recompete for their DSA. Tier 1 OPOs are those with an upper 95% confidence level above the 75th percentile of both the donation rate and the transplant rate from the previous year, and are recertified. All OPOs not in tier 1 or tier 3 are in tier 2, and at risk of decertification, but with the possibility of recompeting for their DSA. OPOs that changed tiers when adjusting for race were identified and described.

3. Results

3.1. National donor and transplant rates by race

The donation and transplant rates were higher among White potential donors than among the non-White race groups nationally (Table 1).

3.2. OPO tier changes when adjusting for race

When adjusting for race, 8 of the 58 OPOs moved 1 tier: 5 in one direction and 3 the other direction (Table 2). Among the OPOs that moved to a better ranking, 4 of the 5 moved from tier 3 to tier 2, which would move them from being decertified without the possibility of recompeting for their DSA to being able to recompete for their DSA. Of concern, 2 of those 4 that moved out of tier 3 in our study currently overperform the national rates among non-White potential donors and have a higher percentage of non-White potential donors. Among the OPOs that moved to a lesser tier ranking in our study, 2 of the 3 currently underperform the national rates among White potential donors in DSAs that have predominantly (84.8%-93.1%) White potential donors.

Table 1
Donation and transplant rates by race, 2020.

Race	CALC[a] potential donors	Donors (donation rate)	Transplants (transplant rate)
Asian/Pacific Islander	3,691	328 (8.89%)	1,020 (27.63%)
Black	18,967	1,889 (9.96%)	6,150 (32.42%)
Other/Mixed Race	2,445	126 (5.15%)	425 (17.38%)
White	76,476	9,260 (12.11%)	29,503 (38.58%)

[a] CALC – Cause of death, Age and Location Consistent with transplantation. Inpatient deaths of patients 75 years or less with a cause of death consistent with transplantation are considered CALC potential donors.

3.3. Sensitivity analysis for Hispanic ethnicity

When including a separate category for Hispanic ethnicity, Hispanic patients donated at the highest rate (13.32%) of all racial or ethnic groups (Supplementary Table 1). When adjusting for the combined race/ethnicity variable, all 8 OPOs that changed rating when adjusting for race alone still changed tiers in the same way when adjusting for race/ethnicity. There were 4 additional OPOs that changed tiers when adjusting for combined race/ethnicity; 3 of these additional OPOs had large (39.9% or more) non-White populations (Supplementary Table 2).

4. Discussion

Previous work has contended that there are no biological reasons that a non-White potential donor would be less likely to donate than a White potential donor.[2,3] The exclusive focus on presence or absence of biological reasons for donation ignores possible real impacts of social reasons. Mistrust of the health care system, lack of racial and ethnic concordance between potential donors or donor families and OPO outreach staff, and certain religious beliefs have been shown to reduce willingness to donate blood and organs.[17,18] Some authors have argued that risk adjustment can "excuse" OPOs that perform poorly in minority patients. This is a specious argument and, in fact, by *not* risk adjusting, one can and does hide some OPOs that actually have lower donation rates in minority patients. Failing to account for social reasons that reduce willingness to donate may explain why OPOs that overperform the national rates among non-White potential donors are represented in the CMS tier 3. Our analyses show that adjusting for race would move 2 OPOs that overperform the national rate among non-White donors in DSAs and that have large proportions of non-White potential donors out of the tier that risks being decertified without the possibility of recompeting for their DSAs.

A limitation of the CDC data used to calculate the potential donor denominator is the small set of covariates available for adjustment. For example, because blood type of potential donors is not available in the CDC data, this study is not able to disentangle the effects of race and biological variables like blood type that may have different prevalences across races and may be associated with the probability that candidates will accept an organ offer.

Additionally, both CDC and SRTR data are based on administrative data collection, so it is not clear how race has been reported—whether self-reported or observed by providers—nor to what extent race reporting has been validated. There is also no link between individual patients in the numerator and the denominator data that might allow more nuanced adjustment for race in evaluation models. In an ideal world, there would be numerator and denominator data linked at the individual level, which would allow adjustment for more nuanced intersections of identity—for example, not necessitating categorizing race into mutually exclusive bins, but allowing adjustment for identifying as, for instance, Black and Native American. Ideally as well, the underlying data for race and ethnicity would be self-reported to reflect identities as individuals experience them, and there would

Table 2
OPOs that change tier when adjusting for race and whether they currently over or underperform national rates – 2020.

OPO	Non race–adjusted tier	Race-adjusted tier	Percent non-White potential donors	Non-White donor performance: (observed/expected[a])	Non-White transplant performance: (observed/expected[a])	White donor performance: (observed/expected[a])	White transplant performance: (observed/expected[a])
Nationally			24.72%				
OPOs that move up in tier when adjusting for race							
OPO1	3	2	39.14%	Overperforms (116/113.95)	Overperforms (396/370.28)	Underperforms (206/218.19)	Underperforms (637/694.18)
OPO2	3	2	44.65%	Overperforms (84/78.83)	Overperforms (298/256.46)	Underperforms (118/120.24)	Overperforms (404/383.08)
OPO3	3	2	41.3%	Underperforms (36/45.03)	Underperforms (108/146.2)	Overperforms (95/79.67)	Overperforms (298/253.84)
OPO4	3	2	35.1%	Underperforms (81/85.6)	Underperforms (248/278.6)	Overperforms (203/199.06)	Overperforms (639/634.22)
OPO5	2	1	22.94%	Overperforms (35/25.63)	Overperforms (104/84.48)	Overperforms (152/146.39)	Underperforms (430/466.41)
OPOs that move down in tier when adjusting for race							
OPO6	2	3	18.95%	Underperforms (8/12.82)	Underperforms (20/41.58)	Overperforms (68/67.32)	Overperforms (225/214.49)
OPO7	2	3	15.16%	Overperforms (45/32.71)	Overperforms (180/106.22)	Underperforms (193/227.03)	Underperforms (682/723.34)
OPO8	1	2	6.9%	Overperforms (10/5.17)	Overperforms (42/16.82)	Underperforms (84/94.7)	Underperforms (259/301.73)

OPO, organ procurement organization.

[a] Expected values are based on indirect standardization for race for the donation rate and race and age for the transplant rate.

be information available on efforts at validation that would allow better understanding of possible misclassifications.

In this study, we deliberately isolated the effect of adjusting for or failing to adjust for a single population characteristic. Therefore, an additional limitation of the present study is that it does not show how OPO evaluations would change when adjusting for a full set of relevant characteristics. A previous SRTR study showed the effects of adjusting for multiple population characteristics, although based on the proposed CMS rule that differed notably from the final CMS rule.[4] Ongoing work is also finding additional factors measured at the population level, like Distressed Community Index, that should be examined for their impact on CMS OPO evaluations.[19,20]

Contrary to the assertion that adjusting for race would hide poor performance by OPOs among minority races, we have shown that failing to adjust for race puts OPOs that are currently performing well among minorities relative to national rates at risk of immediate decertification. At a minimum, evaluations of OPO performance should be adjusted for the proportions of the races served by the OPO to reduce the risk of decertification for OPOs that are actually overperforming the national expectation among the populations they serve. Ideally, performance by the OPO should be examined separately for each race served by the OPO to determine more precisely where they may be overperforming or underperforming.

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Declaration of competing interest

The authors of this manuscript have conflicts of interest to disclose as described by the *American Journal of Transplantation*. J. Snyder reported board memberships with LifeSource Upper Midwest Organ Procurement Organization Inc, Donate Life America, and Organ Donation and Transplantation Alliance.

Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ajt.2024.01.032.

ORCiD

Jonathan M. Miller https://orcid.org/0000-0002-9562-7337
David Zaun https://orcid.org/0000-0003-3787-2470
Nicholas L. Wood https://orcid.org/0000-0003-0768-3759
Grace R. Lyden https://orcid.org/0000-0003-1408-851X
Warren T. McKinney https://orcid.org/0000-0001-7699-9859
Ryutaro Hirose https://orcid.org/0000-0002-2307-0170
Jon J. Snyder https://orcid.org/0000-0001-7974-8940

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